ザンビア SMASTE 授業研究支援プロジェクトフェーズ２

運営指導調査

現地報告書

2009 年 10 月

運営指導調査団

目　次

付属資料：ミニッツ（写）

略　語

DEST	District Education Support Team
DEBS	District Education Board Secretary
ESS	Directorate of Education and Specialised Services
FW	Facilitators Workshop
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteer
NEST	National Education Support Team
PDM	Project Design Matrix
PEST	Provincial Education Support Team
PO	Plan of Operation
SBCPD	School-Based Continuing Professional Development
SMASTE	Strengthening of Mathematics, Science, and Technology Education
SPRINT	School Program of In-service for the Term
SW	Stakeholders Workshop
ZEST	Zone Education Support Team
ZIC	Zone In-Service Coordinator

1．運営指導調査概要

(1) 調査目的

本運営指導調査は、「SMASTE 授業研究支援プロジェクトフェーズ 2」プロジェクト開始から 1 年 7 ヵ月を経過した時点でのプロジェクトの進捗、課題等を確認し、今後の支援方針について検討することを目的として派遣された。具体的調査項目は以下 3 点。

① プロジェクト活動の進捗、成果達成状況、実施プロセスを確認する。

② 評価 5 項目（妥当性、有効性、効率性、インパクト、自立発展性）の観点からプロジェクトの成果、実施上の課題を確認し、対処法に関し、プロジェクトチーム及びザンビア共和国（以下、「ザンビア」と記す）側関係機関と協議する。

③ ザンビア教育セクターに対する今後の協力の方向性に関し、事務所、プロジェクトチーム等、関係者と協議する。

(2) 調査対処方針

① 活動進捗、成果達成状況、実施プロセスの確認

- PDM に沿って計画達成度、指標達成状況を確認する。
- 成果のうち、授業研究活動導入状況については、実態を確認すると同時に、その活動の質（特に実践授業後の検討会での議論に着目する）についても可能な範囲で確認する。
- 授業研究に関するモニタリング（実績確認）については、学校からの報告をディストリクト教育事務所がステークホルダーワークショップ（学期ごと）で確認し、州教育事務所を通じて教育省に報告する仕組みとなっているが、このモニタリングシステムが実績確認のほか、活動の質を担保する仕組みとして機能しているか確認する。
- 授業研究活動が活発な学校と不活発な学校に関する情報を比較するなど、普及を促進（あるいは阻害）した要因を確認する。
- プロジェクト目標、上位目標に関しては、入手できる情報からその達成可能性について確認する。

② 評価 5 項目（妥当性、有効性、効率性、インパクト、自立発展性）の観点からプロジェクトの成果、実施上の課題を確認し、対処法に関し、プロジェクトチーム及びザンビア側関係機関と協議する。

- 評価 5 項目については、事前評価時の評価内容と現状を比較し、状況の変化がないか確認するとともに、終了時評価調査に向けて対処すべき事項があれば、ザンビア側への提言として M/M に記録する（「高い」「低い」等の評価は行わない）。
- PDM 指標のうち、一部は目標値が設定されていない（授業研究に参加する教員の数、モニタリング活動の回数、等）ため、現地で協議し適切な目標値を設

定する。また、現時点で活動の実態にそぐわない、あるいは、指標として適切でないものなどがあるため、修正し、修正版 PDM についてザンビア側と合意する。同時に PO についても最新版を確認し、M/M に添付する。

③ ザンビア教育セクターに対する今後の協力の方向性に関し、事務所、プロジェクトチーム等、関係者と協議する。

- ザンビア側からは「SMASTE 授業研究支援プロジェクトフェーズ３」に対する要請がなされている。要請内容の詳細の確認及びその実施妥当性を判断するため、以下の情報を収集する。
  - ✓ ザンビア教育省、州教育局、学校（教員）の授業研究導入に対するニーズ（授業研究を通じた授業改善の必要性）を認識しているか。
  - ✓ 「Master Plan for School-based CPD under SPRINT in Zambia (through Lesson Study Approach)」が教育省の承認を得て正式化される見込みがあるか。また、全国展開実施体制、実施計画も作成され、かつ、Feasible であるかどうか。
  - ✓ 教育省の継続的予算確保、タイムリーな支出が可能か。
  - ✓ 教員が授業研究活動を継続するインセンティブがあるか、または、活動継続のモチベーションが働く仕組みがあるか（昇級への反映など）。
  - ✓ 授業研究活動の質が一定程度担保されている（担保される仕組みがある）か。
  - ✓ 授業研究普及及びモニタリングの仕組みが構築されているか。
  - ✓ 教員養成校が授業研究活動の普及、質の担保に貢献する可能性があるか。
  - ✓ ICT を活用した授業研究普及に対する支援も要請されているが、その具体的内容。
- 授業研究の全国展開はザンビア教育省の計画であるため、実現可能な計画を策定し、実施計画（詳細）、戦略に関し、プロポーザルにまとめ、日本側に提出するようザンビア側に申し入れる。

④ 調査結果をミニッツに取りまとめる。

(3) 調査団員

職務	氏名	所属
団長・総括	又地　淳	JICA 国際協力専門員/課題アドバイザー（教育）
協力計画	菅原美奈子	JICA 人間開発部基礎教育第二課　調査役

(4) 調査日程

2009 年 9 月 30 日～2009 年 10 月 11 日（現地調査期間）

詳細日程は付属資料（ミニッツ添付評価レポート ANNEX１）を参照。

(5) 調査実施方法

本調査団は、ザンビア側とのMid-Term Joint Review Teamに日本側メンバーとして参加して調査を実施した。調査は、調査団による現地調査に先立ち、各対象州の Provincial Education Support Team (PEST) が作成した進捗報告書[1]、調査団によるプロジェクト関係者に対するインタビュー、選定された学校における授業研究（授業研究サイクルのうち、第 1 回目の授業及び授業後の検討会のみ）の観察に基づいて行った。インタビューは、教育省次官（教育サービス、カリキュラム担当）、中央州知事以下、教育省のプロジェクト関係者、プロジェクト対象校の校長、教員等に対して実施された。主要面談者リストは付属資料（ミニッツ添付評価レポート ANNEX2）のとおり。なお、このうち、プロジェクト主要カウンターパートである NEST 技術サブ会合 (Technical Sub-Committee) のメンバー及び教育省教師教育特殊サービス局現職教員研修ユニットのメンバーは Joint Review Team メンバーとして調査に参加し、日本側調査団とともに調査結果取りまとめに貢献した。授業観察は、各州 PEST により選定された以下の 3 校（各州 1 校）において実施された。

中央州：Nkwashi Basic School, Kabwe District

コッパーベルト州：Dominican Convent High School, Ndola District

北西部州：Solwezi Day High School

いずれも、州の中心部に位置し、授業研究を積極的に推進する学校群のひとつであり、積極的ではない学校や農村部に位置する学校との比較を行う時間的余裕がなかったため、今回の調査結果はこの点を斟酌して解釈する必要がある。

2. 対象案件の背景、概要

(1) 背景

ザンビア政府は、1996 年に教育政策「Educating Our Future」を発表して以来、教育の地方分権化、アクセスの平準化、教育の質の向上に取り組んできた。なかでも、教師の職能開発に注力し、2000 年から現職教員研修プログラム (School Program of In-Service for the Term: SPRINT) を実施している。第 5 次国家開発計画（2006～2010 年）では、教育セクター開発を重点課題のひとつとし、同セクターの優先的投資プログラムのひとつとして「教師教育」を掲げている。右プログラムでは、教員養成と並び、教員の継続的な職能開発 (Continuing Professional Development: CPD) の実施促進とそのシステム強化を重点項目としている。

JICA は、ザンビア政府の教育の質向上に向けた取り組みを支援するため、ボランティア（理数科教師隊員、理科教材開発シニアボランティア等）の派遣や、理数科の教

[1] NEST 定期会合(2009 年 9 月)の報告資料として作成されたもの。州内の全ディストリクトにおける活動について、District Education Support Team (DEST)が作成した報告書に基づき作成された進捗報告書。

科別教師会（Strengthening of Mathematics, Science and Technology Education: SMASTE[2]）に対するアフリカ理数科教育強化ネットワーク[3]を通じた支援を実施してきた。さらに包括的な協力を行うため、2005年より2年間、中央州において「SMASTE理科研究授業支援プロジェクト」を実施した。プロジェクト終了時には、上記SPRINT制度を活用した授業研究制度の定着、モニタリングシステム構築、授業研究実施ガイドライン完成などの成果を達成した。プロジェクト目標である「教室レベルでの授業学習活動の向上」も確認されたほか、対象科目・学年以外への授業研究活動の広がりなど予想以上のインパクトが確認された。

こうした結果を受けて、理科以外、パイロット州以外への授業研究活動の普及展開を図ることをめざして、2008年2月から「SMASTE授業研究支援プロジェクトフェーズ2」が開始された（2011年2月まで）。

(2) プロジェクトの概要

「SMASTE 授業研究支援プロジェクトフェーズ 2」では、中央州における初期・中期基礎学校レベル（1-7学年）・理科以外の教科での授業研究導入、新規2州（コッパーベルト州、北西部州）における中等学校レベル（8-12学年）・理科での授業研究導入に対する支援を実施している。合意されたプロジェクトの枠組み(要約)は下表のとおりである。なお、最新のPDMは、ミニッツ添付評価レポートANNEX3参照。

プロジェクトPDMの要約

【プロジェクト目標】

対象州において、授業研究活動を通じて、教室レベルの授業・学習活動が向上する。

【成果】

1）（北西部州・コッパーベルト州）8-12学年・理科における授業研究活動の導入
2）（中央州）授業研究活動の強化
3）（中央州）1-7学年における授業研究活動の導入
4）（全州）スキルブック（教授技術ブック）の作成
5）（全州）スキルブック（SBCPDマネジメントブック）の作成
6）（全州）授業研究のモニタリング活動の改善、強化

[2] ザンビア数学教育協会（Zambia Association for Mathematics Education: ZAME）、ザンビア理科教育協会（Zambia Association for Science Education: ZASE）、ザンビア技術教育協会（Zambia Association for Technology Education: ZATE）の総称。

[3] （Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa: SMASE-WECSA)

３．調査結果

３－１．プロジェクト進捗、実績の確認

(1) 投入実績

PDMで計画された投入に対する双方の実績は表－1、表－2のとおり。計画された投入に対して双方十分な投入を行い、深刻な遅れなどは確認されなかった。投入実績の詳細は付属資料（ミニッツ添付評価レポートANNEX6～11）を参照のこと。

ザンビア側投入に関して、ほとんどの現場活動に要するコスト（モニタリングやワークショップ参加に要する交通費、ガソリン代、配布資料印刷費、消耗品購入費等）をザンビア側が負担していることは特筆すべき事項である。教育省本省、州、ディストリクト、基礎教育学校における活動経費は教育省の現職教員研修（Continuing Professional Development）経費として確保されているほか、高等学校の場合は、各学校が徴収・管理する学費の中から活動に要する経費を捻出している。

日本側のプロジェクト在外事業強化費による支出は、マレーシアでの研修、他国との技術交換や専門家の地方出張旅費、事務経費等、最小限にとどめられている。

表－１　ザンビア側投入実績

投入要素	実績
カウンターパートの配置	Total number of counterpart personnel assigned to the Project: 115 National Level (NEST): 7 Provincial Level: 33 District Level: 69 (DESO, DEBS, DRCC of 23 targeted districts) College of Education: 6
ローカルコスト負担	Local cost borne by Zambian side: total 28億5,650万ZMK（約5,400万円） National Level: 2億250万ZMK Provincial Level: 2億2,600万ZMK District, Zone, and School Level: 24億2,800万ZMK これらの経費は、国内研修経費、授業研究・ワークショップ実施経費、中央州が北西部州及びコッパーベルト州への技術支援を行う経費として支出された。一部の経費（授業研究実施経費、モニタリング実施経費等）については、プロジェクトによる概算値。なお、PDMでは中央州が他州への支援を行う予算について、中央州に予算配分を行うこととなっていたが、実際には全3州を対象とするステークホルダー・ワークショップ（2008年8月）の開催経費は教育省が直

	接支出した[4]。
授業研究活動やワークショップ開催に必要な施設の提供	(1) Basic Schools and High Schools (2) Zone/District/Provincial Resource Centres (3) College of Education (4) Ministry of Education Headquarter (Curriculum Development Centre and National Science Centre)

表－2　日本側投入実績

投入要素	実績
長期専門家	・長期専門家　2名 授業研究／現職教員研修ﾏﾈｼﾞﾒﾝﾄ　1名 （2008年3月－現在） 業務調整／授業研究活動ﾓﾆﾀﾘﾝｸﾞ　1名 （2009年7月－現在）
第三国専門家派遣	・第三国専門家派遣（2008年度実績）4名 ケニアSMASSEプロジェクトトレーナー4名（2008年9月27日～10月5日）
研修機会の提供 （本邦研修、第三国）	・研修機会の提供（2008年度実績）　34名 （プロジェクト予算による研修） 本邦研修：　国別研修　2名 第三国研修：マレーシア　3名 （プロジェクト予算外の研修） 本邦研修：集団研修　9名 第三国研修：ケニア17名 マレーシア3名
機材供与 （車両、パソコン、プリンタ等）	・供与機材（2007/08年度実績）451万3,000円 業務用車両2台 パソコン4台 プリンター4台 LCDプロジェクター4台 ・携行機材（2007/08年度実績）33万7,000円

[4] なお、中央州による他州への支援経費の支出方法に関して、NEST Technical Sub-Committeeとの協議において、R/Dと同時に署名されたミニッツ（2008年2月25日）では、これらの経費は北西部州及びコッパーベルト州に配分するとの記述がある、との指摘があった。しかしながら、本調査は、最新版PDM（2009年5月10日署名）に基づいて実績確認を行うこととしていたため、ここではPDMの記述に基づき実績を確認した。

	コピー機1台
在外事業強化費	・在外事業強化費　計1,617万4,000円 2007年度 59万円（実績） 2008年度769万5,000円（実績） 2009年度788万9,000円（計画）

(2) 活動実績及び成果達成状況

PDM（第2版、2009年5月改訂）に規定された指標、活動項目に沿って各成果に対する活動実績及び成果指標の達成度を確認した。成果指標に対応するデータは、主に学校が記録した活動実績に関するデータを元に、DEST、PEST、NEST がプロジェクト専門家による指導を受けて取りまとめたデータを参照した。各成果の達成度の概要は表－3のとおり。詳細は添付評価レポート第3章（活動、成果の実績）を参照のこと。

表－3　成果達成度の概要

成果		実績
1	（北西部州・コッパーベルト州） 8-12学年・理科における授業研究活動の導入 （目標実施率：70%）	各学校での授業研究活動は2009年第1学期（1月～2月）に開始され、約70%前後の学校が授業研究を実施し、かつ、実施報告書を提出した（最低1回以上実施した学校をカウント）。 1）北西部州 実施率72.9%（対象校222校のうち162校[5]） 2）コッパーベルト州 実施率67.1%（対象校292校のうち196校）。平均では目標値を下回るものの、先行5パイロットディストリクトでの実施率は90.3%（196校中177校）と非常に高い。
2	（中央州） 授業研究活動の強化 （目標実施率：70%）	8-12学年における授業研究の継続的実施（約70%）、理科以外の教科への展開（約64%）、新規2州に対する技術支援を実施。フェーズ1では州が実施していたステークホルダー・ワークショップをディストリクトが実施。 1）授業研究の継続的実施（8-12学年） 実施率70.9%（対象校327校のうち232校[6]）

[5] 高等学校（High Schools、第10-12学年）と基礎教育学校（後期基礎教育課程：第8学年、9学年を有する学校）の合計。評価レポートでは学校種別ごとの実施率を記載。

[6] なお、フェーズ1終了時評価時点での実施率は82.9%（対象校257校のうち213校）であり、実施率が低下しているようにみえる。しかしながら、基礎教育学校の大幅な増加（228校→298校）に伴い、対象校数が増加しているため、単純な比較は困難である。フェーズ1終了時評価調査以降に、新たに第8-9学年を設置しプロジェクト対象校となった基礎教育学校における授業研究実施率が低いため、全体の実施率を引き下げたものと考えられるが、フェーズ1でも対象であった学校も含めた全対象校における授業研究実施に関する詳細な履歴データがないため、今次調査での検証は困難であった。なお、高等学校における実施率には変化はみられない（29校中28校）。

		全ディストリクトがワークショップを4回実施。 2) 他教科への展開 ・ 63.9%（調査対象校247校のうち158校）が理科以外の科目でも授業研究を実施。 3) 新規2州に対する技術支援 ・ 教育省本省との協同により、全3州のステークホルダーに対する導入ワークショップを実施（2008年8月）。ただし、継続的な支援は非常に限定的（予算不足、他州支援可能なリソースパーソンが限られていたことが原因）。
3	（中央州） 1-7学年における授業研究活動の導入 （目標実施率：70%）	・ 約42.1%（対象校214校のうち90校）が授業研究を実施。 ・ 平均では目標値を下回るが、ディストリクト間の差が大きい（83.3%～11.9%）。データの信頼性[7]も含めて更なる調査、フォローアップが必要。 ・ データ収集に成功したディストリクトでは80%前後の学校が実施しており、おおむね順調。
4	（全州） スキルブック（教授技術ブック）の作成	・ 教授技術ブック（第1版）は2009年8月に完成。 ・ ファシリテーター向けトレーニング教材として順次ワークショップで活用される予定。 ・ フィードバックを踏まえ2010年に改訂する予定。
5	（全州） スキルブック（SBCPDマネジメントブック）の作成	・ マネジメントスキルブック（ドラフト）は2009年8月完成。 ・ NEST Technical Sub-Committee メンバーによる検討を経て2010年3月完成予定。
6	（全州） 授業研究のモニタリング活動の改善、強化	・ 学校における授業研究実施状況把握、PEST/DEST等外部者による授業研究モニタリングのためのフォーマットが作成され、利用されている。 ・ 学校の進捗報告書を取りまとめたPEST進捗報告書のデータは本調査の基礎情報として活用された。

なお、本プロジェクトPDMの成果指標は項目数が多いうえ、指標として必ずしも適当ではないもの（指標に対応する活動項目がない、単なる活動の言い換え、目標値や測定方法が明確でなくデータ収集が不可能、等）が複数あり、これらは調査対象外とした。後述するが、本調査評価レポートでは、調査にあたり問題のあった指標を一覧表にまとめ、改訂

[7] 学校における授業研究実施状況はディストリクトワークショップにおいて、DESTが各学校から収集する実施報告書に基づいて把握される。何らかの理由で（開催案内の不達・遅配、あるいは予算不足）ワークショップに参加しなかった学校における実施状況は把握できないため、このデータに反映されていない。実施率が極端に低いディストリクトは、ワークショップへの参加率も低いことから、学校での実施状況が正確に把握されていない可能性がある。

案を提示した。今後 NEST Technical Sub-Committee での検討を踏まえ改訂することを提案した。

３－２．現地調査により確認されたプロジェクトの成果発現状況、課題等

本プロジェクトはおおむね順調に期待される成果を達成しつつあるといえる。新規対象州でみられるように、授業研究の開始には一定程度の時間を要するものの、いったん校長や教員がその効果を実感すれば次第に定着していくものと考えられる。調査団がインタビューした教員の中でも、特に積極的に授業研究を実施している教員は、①教員同士の一体感が高まる、②教えにくい単元でも自信をもって教えられるようになる、③生徒の理解度が高まる、といった効果を実感している。授業研究は、最初の導入（校長、教員の意識改革）に成功すれば、彼ら自身のやる気によって持続可能なアプローチといえる。

本プロジェクトが円滑に実施されている要因として、主要カウンターパートの熱意、コミットメントなど通常不可欠な要素に加えて、①プロジェクト実施のために新たな仕組みを構築するのではなく、既存の現職教員研修の仕組み（SPRINT）[8]を活用したこと、②本邦研修、第三国研修等の機会を戦略的にプロジェクトの主要 C/P に割り当て、これら帰国研修員を有効活用していること、が挙げられる。SPRINT は、2000 年から開始された教育省のプログラムで、州、ディストリクトレベルの支援の下、教員グループを組織し相互に研鑽しあう仕組みである。授業研究アプローチは、SPRINT の中で形成された教員グループが実際に取り組む活動のひとつとして位置づけられているため、学校現場でもこれまで実施してきた活動を更に活性化させる方策として捉えられている。また、教育省本省、州、教員養成校などで中心的な推進役となる職員や教員（ファシリテーター）が各種海外研修に参加し、更に研修で学んできたことをワークショップ等で共有することが必須となっていることも、知識や経験の共有を促進し、授業研究活動の推進に貢献している。

以下、プロジェクト活動の核である授業研究について、「質」「マネジメント」「モニタリング」の３つの観点から、本調査で確認された成果、課題等を概観する。

(1) 授業研究の質

調査団は、３校において、授業研究サイクルのうち授業実践とその後の検討会を観察した。

授業については、途上国で一般にみられる授業（教師が一方的に話し、生徒は教師の話や黒板を書き写すだけ）とは異なり、よく計画・準備されており、授業の中でも生徒の意見を引き出すよう努力していることが観察され、これまでの授業研究活動の成果が現れていた。

他方、授業後の検討会については、参加者からの多くのコメントは時間管理や教材の準備、教師の発声など、表面的に観察できる事項に集中し、本質的な授業の質（発問の質や

[8] School Program of In-Service for the Term (SPRINT)

生徒の反応等）に関するコメントは限定的であった。ザンビアの授業の現状を考えれば観察できる事項が改善されるだけでも大きな成果といえるかもしれないが、将来的に生徒が理解できるようになる授業、思考力を高める授業をめざすには、教師の発問を一字一句書き取って検討の材料とするなど、更なる工夫が必要となる。

(2) 授業研究のマネジメント

授業研究の実施にあたっては、教員自身のやる気がまず必要であるが、これを支えるものとして、校長のコミットメントとリーダーシップ、教育行政官のコミットメントが不可欠であることも観察された。

訪問した学校はいずれも積極的に授業研究を推進していたが、例外なく校長がリーダーシップを発揮し、教員の活動を支援していた。いずれの学校でも導入当初は教員からの反発があった(時間外の業務をやりたくない、面倒くさい等)とのことであるが、ある学校では、学校時間割の中に授業研究のための時間を組み入れ、教員の就業時間内(８時間)にすべての活動を実施できるようにしたり、教員が授業研究に参加している間、彼らの受け持ちクラスは教科主任（Senior Teacher）に担当させるなどして、教員が活動に参加しやすい環境を整備していた。これらは校長としてのリーダーシップが発揮されている良い例といえる。

授業研究アプローチの学校への導入は教育省の政策として推進されているものである。州、ディストリクトレベルの教育行政官がこれらの政策実施を担うが、これら行政官が政策推進のための具体的なアクションを取ることも有効である。例えば、コッパーベルト州の Provincial Education Officer は、授業研究活動への積極的参加を教員昇進の条件のひとつとするという方針を州レベルワークショップで発表し、加えて同様の通達を全校長に発出した。州のトップレベルからの通達は校長にとってプレッシャーとなると同時に、教員にとっても活動に参加するインセンティブにつながるものと考えられる。

これら促進要因が観察された一方で、遠隔地にある学校での授業研究実施やファシリテーターの活動実施に関して懸念材料も確認された。都市部では学校間の距離がそれほど離れていないため、複数の学校から教員が集まったり、州やディストリクトでのワークショップに参加したりすることにさほどの困難はない。しかし、農村部では、学校あたりの教員数が少ないこと、学校間の距離が離れていること、予算が不足していること、等が阻害要因となるとの報告があった。農村部の基礎教育学校 8-9 学年では、配置される教員数が少なく（理科担当教員は１名のみ等)、学校ベースで教科の教員グループを形成できないため、複数の学校で構成される学校群（クラスター）を形成し、授業研究を実施することとなっているが、学校同士が離れているうえに、交通手段（あるいは交通費に充当する予算）が不足しているために、参加できない教員がいる。また、現在任命されているファシリテーター(現職教員)は、自分の学校を含め複数校の授業研究活動を支援する役割を担っているが、他校の授業研究活動へ参加する際の交通費を自分の学校から支給してもらえな

いことがある、という報告も聞かれた。しかしながら、今回の調査で聞かれたこれらの懸念材料は、実施にあたって致命的というわけではなく、ある程度は校長や州、ディストリクト教育事務所のコミットメント、リーダーシップによって次第に解決されるものと考えられる。

(3) 授業研究のモニタリング

各学校で行う授業研究活動は、PEST メンバー、DEST メンバー、ファシリテーター等がモニタリングを行うこととなっている。交通手段や予算の不足を理由に頻繁なモニタリングは難しい、という声も聞かれたが、学校現場ではこれら外部者によるモニタリングは非常に効果的であるとの報告があった。授業研究は学校内の同じメンバーで継続される活動であるため、知識やアイデアが共有されるとそれ以上の発展は難しくなる。外部者によって新鮮な視点、新たな知識、技術が定期的にもたらされることが授業研究を活性化させるうえでは必要となる。

プロジェクト活動の中では、学校における授業研究実施状況把握、PEST/DEST 等外部者による授業研究モニタリングのためのフォーマットを用いてデータを収集しているが、これまでのところこれらのデータは主に活動実績の記録としてとどまっており、活動が遅れている地域への追加支援を行ったり、授業研究の質を向上させるための追加的インプットを行ったり、というフィードバックには活用されていない。

(4) 観察された正のインパクト

プロジェクト活動として計画されていなかったものの、対象外の学校（コミュニティスクール、私立学校）、学年（新規 2 州の初期・中期基礎教育学校）、科目（新規 2 州の理科以外）においても授業研究活動の広がりが観察された。また、コッパーベルト州、北西部州の教員養成大学関係者からも、教官相互が授業研究に取り組んでいる、あるいは生徒同士が教員役と生徒役に分かれて模擬授業実践を行っている、など、授業研究活動を取り入れているとの報告があった。これらは、授業研究に対する関心の高さをうかがわせる。

３－３．提言

Mid-Term Joint Review Team として協議した結果を踏まえ、以下のとおり提言を取りまとめた。提言については、2009 年 12 月に開催される予定の NEST Technical Sub-committee において検討され、具体的なアクションにつなげられることとなった。

【プロジェクト終了時までに取り組まれるべき活動に関して】

(1) 学校長に対する継続的な能力強化と動機づけの維持

a) 学校ベースの継続的職能開発（School-based Continuous Professional Development: SBCPD）の活動の成否は、学校長のやる気（コミットメント）と管理能力に大きく左

右される。したがって、授業研究の意義と効果に関する学校長の理解を促進すること、及び学校長の学校マネジメント能力の強化を継続的に行うことが重要である。

b) 予算の制約等により、PEST や DEST が学校訪問による外部モニタリングを十分に実施できないへき地などでは、学校内で行う内部モニタリングを強化する必要がある。そのために、学校長、副校長、教科主任の、授業観察のしかた、授業検討会の進め方の技術などのモニタリング能力を強化する必要がある。

c) 上述の能力強化を促進するために、マネジメントスキルハンドブックが計画どおり完成・配布されることが必要である。

d) 努力している学校長や学校の実践例を共有したり、表彰するなど、熱心な学校や校長が更に動機づけられ、熱心でない学校長がやる気を起こすような工夫が必要である。

(2) モニタリングデータの効果的活用

a) モニタリング活動を通して集められたデータは、主に授業研究を何回実施したか等の定量的な分析に活用されているが、授業の質を改善するための活用は十分とはいえない。集められたデータを分析することにより、現場が抱えている課題を抽出し、DEST が現場のニーズに対応したファシリテーター研修プログラムを立案できるようにすることが必要である（研修プログラムのローカル化）。

b) 効率的に外部モニタリングとしての学校訪問を行うために、集められたデータを分析することにより、問題を抱えているディストリクト、学校を特定するなど、モニタリングデータの効果的な活用を検討すべきである（戦略的モニタリング）。

(3) ファシリテーターの量及び質的な強化

a) 少なくとも、1 ゾーンに 1 人以上の充分な数のファシリテーターを確保することが必要である。また、異動や退職などの事態に対応するためのファシリテーター養成の仕組みをつくっておく必要がある。

b) 一般の教員以上の貢献を要求されるファシリテーターを動機づけるために、ファシリテーターに対して証書の授与、昇進との連携、そして、特に優秀なファシリテーターを表彰するなどの動機づけを高める方策を考慮されたい。

(4) 授業検討会の質の向上のための方策

a) 授業の観察事実に基づいて議論をすることが必要である。今回観察した授業検討会では、ブルームのタキソノミーに沿って教員の発問をレベル分けし、どのレベルの発問がいくつあったかを議論していたが、このような方法は授業の傾向を把握したり、授業を総体的に評価したりするためには有効ではあるが、その議論からは具体的な授業の改善点はみえない。重要なのは、どのような発問が実際にされたのか、それらの発問が生徒にどう受け止められ、生徒がどのように反応したのか、それらの発問は適切

だったのかなどの、具体的な「事実」を基にした議論であり、具体的事実を議論することにより具体的な改善点が明らかになる。

b) また、生徒がどう思っていたかを把握するために、授業終了後に生徒に簡単なコメントを書いてもらい、それを検討会に活用するのも一案である。

c) 今回見られた授業検討会のやり方は、授業観察者が一人ひとり自分の感想を述べるだけで終わっていた。観察者の発言の中には、掘り下げることにより、より有意義な議論ができるようなテーマとなり得るものも含まれており、ファシリテーターがそれらを取り上げ、議論の焦点を絞ることのできる能力を身に付けることが必要であろう。さらに、学習指導案（授業案）を協働で作成する際に、あらかじめ今回の授業で特に議論したいテーマ（教科内容ではなく、発問、導入の仕方などのテーマ）を決めておき、授業後にはそのテーマについて、掘り下げた議論を行うことも考慮されたい。

d) 以上のようなことを現場レベルで進められるよう、外部者が行うモニタリング用ではなく、授業の質についての議論を促進するような、学校レベルで日常的に使うことができるような簡便な授業観察シートの導入を検討されたい。

e) また、授業検討会の議論の質を外部者がモニタリングすることも有用である。例えば、教員の声の大きさや教員の立ち居振る舞いなど授業の質へ直接影響を与えないようなコメントがどれだけなされ、主発問と教材の関連は適切だったか、生徒の反応はどうだったかなどの授業の質に直接関連するようなコメントがどの程度あったのかを、記録しコメントすることも一案である。

(5) 国家レベルの調整及び監督機能の強化

a) 授業研究の全国拡大にあたっては、州間の調整、予算の配賦など PEST レベルでは解決できないような課題に対して、国家レベルの調整・監督機関として NEST や In-service Unit はこれまで以上に大きな責任を負うことになるため、一層の機能強化が必要である。

b) 各州で集められたモニタリング結果を分析し、問題を抱えていそうな州、ディストリクトなどを特定したり、地方に出張する機会などを活用し、学校訪問したりするなど、中央レベルでもある程度現場の状況を把握していくことが必要である。

c) また、教科内容や質の課題に対して、中央レベルでの議論や助言ができるように、Directorate of Standards and Curriculum との連携を更に強化すべきである。

(6) PDM の改定について

a) 今回の調査を通して、PDM の指標のいくつかは現行のままでは事業評価には適しないことが明らかになった。目標値がないもの、指標評価のためのデータ収集が著しく困難なもの、アウトプットに対して必要以上の指標を設定しているものなどを、より適切な指標に変更する必要がある。また、PDM と活動計画の内容にも齟齬がみられるた

め、PDM と活動計画が整合するよう、PDM の改定とともに活動計画も見直す必要がある。詳細は、付属資料（ミニッツ添付評価レポート ANNEX12）を参照。

b) 2010 年 10 月前後に予定されている終了時評価に間に合うよう、2010 年 3 月までに改訂作業を終えることを提言する。

【更なる学校ベース CPD の発展と JICA の協力のために】

(1) マスタープランの完成

SBCPD の全国展開にあたっては、どのようなプロセスでどのような仕組みで拡大するかを綿密に計画する必要がある。特に、JICA が引き続き支援を行うためには、それらのプロセスがある程度具体的に書かれた計画であるマスタープランの完成と承認が前提となるため、現在教育省がドラフト策定中の「学校ベースの継続的専門性開発（SBCPD）プログラムの戦略的拡大と実施のマスタープラン」の完成が重要である。

(2) 予算の確保

上記マスタープランの承認とともに、NEST 及び In-service Unit は、中央レベルで全国展開に必要な予算を確保すると同時に、各州、各郡、各学校が十分な予算を SBCPD 活動に割り当てているかを監督する必要がある。

4．団長所感

(1) アフリカにおいて JICA が支援している教員研修プロジェクトは 10 カ国以上あるが、授業研究の導入を中心としているものは現在ではザンビアとガーナ共和国（以下、「ガーナ」と記す）の 2 カ国しかない。現在カスケード型の現職教員研修を中心に行っている国も、将来的には学校ベースで継続的に実施可能な授業研究的な要素を取り入れていく動きが出てきているなか、ザンビアの経験は他国の先駆的事例として大きな意味をもつ。

(2) 本プロジェクトでは、ザンビア側のオーナーシップの高さが非常に際立っている。英国の支援でつくった「仕組み（器）」に、日本の支援によって授業研究という「内容」を入れ、更にベルギー王国（以下、「ベルギー」と記す）などの支援を通してその仕組みと内容を拡げていくなど、ザンビア側がドナーからの支援を効果的に活用していることが感じられた。さらに、ドナーからの技術支援を咀嚼し、確実に自らの能力向上に結び付けていっていることもうかがわれた。本プロジェクトでは、ザンビア側の高いオーナーシップの下に組まれたプログラムの中でドナーの支援が効果的に活用され、まさに、「運転席に途上国自身が座ってハンドルを握っている」状況がみられた。しかしながら、それらを可能とした中心的カウンターパートが、フェーズ２の中間時点において退職や進学のために複数抜けたため、今後の進展については必ずしも楽観的ではない。

(3) 授業研究は基本的に学校ベースで行うという性質上、学校長さえやる気になれば、あ

る程度まではどの学校でも導入が可能なアプローチであり、学校レベルでの自立発展性が高いアプローチであるといえる。しかしながら、活動の継続や質の向上のためには、教員の教材研究のために必要な資料、外部者による定期的なモニタリング、授業検討会の議論の質を確保する仕組み、マンネリ化を防ぐための外部介入など、必要な環境整備を行うことも必要である。

(4) 中井専門家の話から、やる気のある学校長、管理能力の高い学校長ほど授業研究に積極的に取り組み効果的に運営する反面、やる気のない学校長、管理能力の低い学校長の学校ほど授業研究の実施には困難を伴う傾向があることが感じられた。授業研究を実施するためには、授業研究に取り組むよう教員のやる気を引き出したり、毎週集まるための時間を確保したり、教員が集まって研究授業を行っている時間に留守にする教室の生徒をどうするかなど、動機づけや校内の調整が必要になるため、学校マネジメント能力そのものが問われるアプローチであるといえる。やる気のある学校では、授業研究をやることによって、更に学校全体が良くなっていくという良循環を生む可能性をもっている反面、やる気のない学校長、管理能力の低い学校長の学校では取り組みがおろそかになるという二極化する構造を内包しているアプローチともいえる。したがって、授業研究を全国普及するにあたっては、やる気のない学校長をどのようにして動機付けるか、管理能力の低い学校長に対してどのように能力強化を図っていくか、また、それらのやる気のある学校を伸ばし、やる気のない学校をやる気にさせる制度や政策の導入などの環境整備も重要になる。

(5) 授業研究の普及にあたっては、国、州、学校などの各レベルにおいて、その上層部に、授業研究に対する熱烈な支持者（信望者）がいることが重要な条件となると思われる。授業研究の実施には、それなりの金銭的コストや実施コストが伴うため、導入に対して抵抗する関係者は少なくない。それらに対して、授業研究の効果を説き、そのような抵抗勢力に対して「とりあえずやってみよう」と思わせることが導入時には必要であり、いかにしてそのような「伝道者」を各レベルにおいて養成していくかが非常に重要である。

MINUTES OF MEETING
BETWEEN
CONSULTATIVE MISSION TEAM
OF
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF ZAMBIA
ON
JAPANESE TECHNICAL COOPERATION
FOR
SMASTE SCHOOL BASED CONTINUING PROFESSIONAL DEVELOPMENT
PROJECT PHASE II

The Japanese Consultative Mission Team (hereinafter referred to as "Team"), organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Atushi Matachi, visited the Republic of Zambia (hereinafter referred to as "Zambia") from 30th September to 10th October 2009 in order to take part of the Mid-term Joint Review of SMASTE School-Based Continuing Professional Development Project Phase II (hereinafter referred to as "the Project").

During its stay in Zambia, the Team visited several schools and exchanged views through a series of discussions with the concernd persons of the Ministry of Education, educaiton administrators and teachers of targeted three Provinces, namely Central Provice, Northwestern Provice, and Copper belt Province, on the progress and challenges of the Project.

As a result of the discussions, the members of the Joint Review Team prepared the report that summarizes the achievements of the Project, major findings, and recommendations to the Project team for further improvement of the Project. Both sides agreed on the contents of the rport as attached hereto.

Lusaka,
10th October, 2009

Permanent Secretary (Education Services, Standard and Curriculum) Ministry of Education	Leader Consultative Mission Team Japan International Cooperation Agency

ATTACHMENT

The Report of Mid-Term Joint Review SMASTE School-Based Continuing Professional Development Project Phase II

October 2009

Prepared by
Mid-Term Joint Review Team
The Ministry of Education
and
Japan International Cooperation Agency

ABBREVIATIONS

DEST	District Education Support Team
DEBS	District Education Board Secretary
ESS	Directorate of Education and Specialised Services
FW	Facilitators Workshop
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteer
NEST	National Education Support Team
PDM	Project Design Matrix
PEST	Provincial Education Support Team
PO	Plan of Operation
SBCPD	School-Based Continuing Professional Development
SMASTE	Strengthening of Mathematics, Science, and Technology Education
SPRINT	School Program of In-service for the Term
SW	Stakeholders Workshop
ZEST	Zone Education Support Team
ZIC	Zone In-Service Coordinator

ANNEXES

1. Detailed Schedule during the Stay of JICA Mission Team
2. The List of Interviewees
3. Project Design Matrix (Ver.1, revised on May 11th, 2009)
4. SMASTE-SBCPD Phase 2 Project Concept Diagram
5. Organization Chart of the Project
6. List of the Assigned Core Counterparts
7. Financial Input from Zambian Government
8. Building and other Facilities
9. List of Japanese Experts
10. Overseas Training
    - 10-1 Counterpart Training in Japan
    - 10-2 Third Country Training
    - 10-3 Technical Exchange Program
11. List of Machinery and Equipment
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Table of Contents

I. Introduction - Outline of the Mid-Term Joint Review

1. Background and Purpose of the Review

The purposes of this mission are to review the progress of project activities and assess the achievements of project outputs at the time when one year and seven months have passed since the commencement of "SMASTE School-Based Continuing Professional Development Project Phase II" (hereinafter referred to as "the Project"), which is implemented from February 2008 to October 2009, and to discuss the possible plan of further cooperation between Zambian and Japanese parties.

The objectives of the Mid-term Joint Review are;

(1) To review the implementation of activities under the Project according to Project Design Matrix (PDM) and Plan of Operation (PO);
(2) To have common understanding on the progress of the activities and issues related to project implementation among the members both in Zambian and Japanese parties; and
(3) To have a common vision for achieving targets of the Project and future cooperation between Zambian and Japanese parties.

2. Period of the Review

The Mid-Term Joint Review was conducted from September 2009 to October 2009. First, Zambian stakeholders has started its data collection in September 2009. The JICA Mission Team joined the Mid-Term Joint Review Team from September 30th to October 10th, 2009. The detailed schedule during the stay of JICA Mission Team is as in ANNEX 1.

3. Members of the Joint Review Team

The Mid-Term Review was jointly conducted by both Zambian and Japanese parties. The members of the Team are shown below.

The Members of the Mid-Term Joint Review

Zambian party:

James S. Mulungushi (Dr.)	Permanent Secretary (Education Services, Standard and Curriculum)
Ruth M. Muganba	Director (Education & Specialised Services)
Esvah Chizambe (Ms.)	Senior Education Officer - Resource Center
Gibson B. Chola (Mr.)	Senior Education Officer - High School

Kebby K. Kayombo (Mr.)	Senior Education Officer - Basic School
M. Simatende (Mr.)	Provincial Education Standards Officer, Central Province
Tabeth C. Chisanga (Mrs.)	Provincial Education Standards Officer, Copperbelt Province
Allan Lingambe (Mr.)	Provincial Education Standards Officer, Northwestern Province
Benson Banda (Mr.)	Principal Education Officer, National Science Center
Rabbecah Twelasi (Mrs.)	SMASTE/JETS Administrative Secretary, National Science Center
K.C. Lungwe	Acting Principal, Nkrumah College of Education
Alex K. Tumeo	Senior Lecture, Copperbelt College of Education
Grace K.C. Chilekwa	Acting Principal, Kitwe College of Education
Tebeka John	Senior Lecture, Mufulira College of Education
Mutobo Andrew	Principal, Solwezi College of Education
Japanese party:	
Atsushi Matachi	JICA Joint Review Mission Team Leader, Senior Advisor (Education), JICA
Minako Sugawara	JICA Joint Review Mission member, Assistant Director, Human Dev. Dept., JICA
Shiro Nabeya	Resident Representative of JICA Zambia Office
Hajime Fukuda	Assistant Resident Representative of JICA Zambia Office
John Chileshe (Dr.)	Consultant (Education Sector), JICA Zambia Office
Kazuyoshi Nakai	JICA Technical Advisor for the Project
Asami Shimoda	JICA Technical Advisor for the Project

4. Methodology of the Review

The review was conducted mainly based on the data collected by National Educational Support Team (NEST) in the collaboration with Provincial Education Support Teams (PEST), District Education Support Teams (DEST) and targeted schools. The qualitative data were also collected through several interviews and the observations of selected three demo lessons and reflection meetings conducted by the Team with concerned persons of the Project. The list of interviewees is attached as ANNEX 2.

The selection of schools and lessons observed were selected by each PEST. It should be noted that there are some limitations to this study mostly due to the time constraints, such as the limited number of stakeholders actually interviewed, and the limited number of lessons observed. Therefore, this limitation should be taken into consideration when interpreting the result of this study.

5. Structure of this Report

This report compiled the results of the Mid-Term Review and the relevant information and the rest of this report is composed by the following four sections: (1) Outline of the Project, (2) Achievement of the Project activities and outputs, (3) Major Findings, and (4) Recommendations. In addition, detailed data are attached as annexes.

II. Outline of the Project

1. Background

The Government of the Republic of Zambia attaches great importance to teacher education and the Ministry of Education has established a system, which is called "School Program of In-service for the Term (SPRINT)," in order to regularize Continuing Professional Development (CPD) of teachers. This is reaffirmed in the Fifth National Development (FND) and National Implementation Framework (NIF).

JICA has supported the Ministry's efforts by dispatching Japan Overseas Cooperation Volunteers (JOCV) in the field of science and mathematics education, and providing such opportunities as technical trainings in Japan, Kenya and Malaysia, and technical exchanges with other countries through a regional network, called Strengthening of Mathematics, Science and Technology Education in Western, Eastern, Southern, and Central Africa (SMASE-WECSA). In addition to these supports, JICA has supported the strengthening of CPD through lesson study approach by the technical cooperation project called "SMASTE School-Based Continuing Project Phase I" since 2005. This project aimed at improving science and mathematics education, mainly through lesson study, and targeted Grade 8-12 science teachers in Central Province. Phase I had successfully injected lesson study approach in the framework of SPRINT, established the monitoring system of lesson study activities, and developed the implementation guideline of lesson study. Based on these remarkable results, Zambian side and Japanese side had agreed to start "SMASTE School-Based Continuing Project Phase II" since 2008 in order to cover all grades and subjects in Central Province and add two more provinces as target provinces, namely Copperbelt and Northwestern.

2. Summary of the Project

The outline of the Project, which is stipulated in the Project Design Matrix (PDM) (Ver. 1, agreed on May 11th, 2009), is described below. The details of the Project are shown in ANNEX 3. The Diagram (ANNEX 4) also shows the Project Concept.

2-1 Overall Goal

Sustainable School Based Continuing Professional Development (SBCPD) through Lesson Study is extended to the rest of the country.

2-2 Project Purpose

Teaching/learning activities in the classroom are improved through lesson study in three target provinces (Central Province, Copperbelt Province, and Northwestern Province).

2-3 Outputs

Output 1: Lesson study activities in science are introduced to school at Grades 8-12 in Northwestern Province and Copperbelt Province.

Output 2: Lesson study is strengthened in Central Province.

Output 3: Lesson study framework is integrated into Grades 1-7 SBCPD based on the experience on Grades 8-12 of Central Province.

Output 4: Teaching Skills Book is developed based on the experiences of the three target provinces.

Output 5: Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces.

Output 6: Monitoring of SBCPD is improved in the target provinces.

3. Implementation Structure of the Project

The Project is implemented and managed by several stakeholders at national, provincial, and district levels. Two Japanese experts are assigned to the Ministry of Education's headquarters as the members of NEST in order to provide technical advice for the overall management of the Project. The details are shown in ANNEX 5.

III. Achievement of the Project Activities and Outputs

1. Inputs

Both Zambian and Japanese sides have contributed to providing sufficient inputs for the smooth implementation of the Project. The Team did not observe any serious delay in terms of the timing of inputs.

1-1 Zambian Side

The original PDM indicates that Zambian side would provide the following inputs:

- ✓ Counterpart personnel
- ✓ Office facilities (at Headquarters and in targeted provinces) and their running costs
- ✓ Costs for in-country training and conducting lesson study activities and workshops
- ✓ Funds to be allocated to Central Province for technical assistance to Northwestern Province and Copperbelt Province
- ✓ Buildings and other facilities necessary for conducting lesson study activities and workshops

The table below shows the actual inputs from Zambian side. For further details of each input, see ANNEX 6, 7, 8. It is noticeable that Zambian side has borne the major costs used for the activities conducted at provincial, districts, zone levels, such as fuel and travel allowances for monitoring, and consumables used in workshops. As the budget for these activities is secured under the Ministry's budget for SBCPD, education offices at each level is responsible for budgeting planned activities so that each office is allocated sufficient budget from the Ministry. In addition, it is remarkable that schools also have financially contributed to the programme by allocating some funds to send their teachers to workshops and facilitators (teachers) to neighbouring schools for monitoring of SBCPD.

Inputs from Zambian Side

Items	Actual Inputs
Counterpart personnel (ANNEX 6)	Total number of counterpart personnel assigned to the Project: 115 National Level (NEST): 7 Provincial Level: 33 District Level: 69 (DESO, DEBS, DRCC of 23 targeted districts) College of Education: 6

Local cost (ANNEX 7)	Local cost borne by Zambian side: total 2,856,500,000 ZMK National Level: 202,500,000ZMK Provincial Level: 226,000,000ZMK District, Zone, and School Level: 2,428,000,000ZMK These funds were used for conducting workshops, monitoring lesson study activities and workshops at various levels, providing technical assistance to Northwestern and Copperbelt Provinces by Central Province during the period between March 2008 and September 2009. Although the original PDM indicates that funds are to be allocated to Central Province for technical assistance to Northwestern Province and Copperbelt Province, such funds were not actually allocated to Central Province, but disbursed by the Ministry's headquarters. It should be noted that some of the costs are calculated based on the estimation and may not reflect the actual amount disbursed (e.g. cost for lesson study activities at schools and monitoring costs).
Buildings and facilities (ANNEX 8)	The following buildings and facilities were used for conducting the Project related activities: (1) Basic Schools and High Schools (2) Zone/District/Provincial Resource Centres (3) College of Education (4) Ministry of Education Headquarter (Curriculum Development Centre and National Science Centre)

1-2 Japanese Side

The original PDM indicates that Japanese side would provide the following inputs:

- ✓ two long-term experts
- ✓ third-country short-term experts
- ✓ training opportunities for education managers and teachers
- ✓ equipment and materials
- ✓ local costs for experts' activities and local expertise when necessary

The table below shows the actual inputs from Japanese side. For further details of each input, see ANNEX 9, 10, 11.

Inputs from Japanese Side

Items	Actual Inputs
Long-term experts (ANNEX 9)	Long-term experts: 2 1. Lesson Study and INSET Management 1 March 2008 to present 2. Coordination and Monitoring of Lesson Study Activities 1 July 2009 to present
Third-country short-term experts	Third Country Short-term experts: 4 JFY 2008: four third country experts from Kenya SMASSE
Training opportunities for education managers and teachers (ANNEX 10-1, 10-2, 10-3)	Education Managers and Teachers trained overseas: total 41 Training in Japan: 11 Training in Kenya: 17 Training in Malaysia: 6 Technical Exchange Program with Uganda: 7
Equipment and materials (ANNEX 11)	Project Equipment provided in totalling 4,513 thousand yen (approx. 237,526,315 ZMK) Vehicle: 2 PC: 4 Printer: 4 LCD Projector: 4
Local costs for experts' activities and local expertise when necessary	Local cost spent in totalling 16,174 thousand yen (approx. 851,263,157 ZMK) JFY2007: 590 thousand yen (actual) JFY 2008: 7,695 thousand yen (actual) JFY 2009: 7,889 thousand yen (planned)

2. Progress of the Project Activities and Achievements of Outputs

The Team reviewed the progress of the Project activities and achievements of the outputs. The progress of the Project activities are reviewed in comparison with the original Plan of Operation (PO), while the achievements of the outputs are basically checked by the objectively verifiable indicators stipulated in the original PDM. However, the Team found that the reliable data and information cannot be collected since the target figure and the means of verification of some indicators are not clearly defined in the original PDM. Therefore, these indicators are not considered in this review.

2-1 Output 1

Lesson study activities in science are introduced to school at Grade 8-12 in Northwestern Province and Copperbelt Province.

The achievement of this output is verified by the following indicators:

- ✓ No. of schools in the piloting districts participating in lesson study activities (target figure: 70%).
- ✓ No. of school managers who participate in SW/FWs (target figure: 70%).*[N/A[1]]*
- ✓ No. of cycles of lesson study activities in a school/cluster (target figure: 3 cycles per term). *[N/A]*
- ✓ No. of teachers participating in lesson study activities.
- ✓ No. of facilitators in SW/FWs. *[N/A]*
- ✓ The revised Implementing Guideline.

The activities under Output 1 intended mainly for science teachers who are responsible for Grade 8-12 to practice lesson study activities in Northwestern Province and Copperbelt Province. After stakeholders and facilitators of these two provinces attended the national level workshop, which was organized by NEST and PEST (Central), in August 2008, they have started their activities in each province. Actual lesson study activities at schools were launched since the first term of 2009 (from January to February). At the first stage of introduction, 5 districts in Copperbelt Province[2] and 3 districts in Northwestern Province[3] were selected as pilot districts. Later in the year, remaining districts also started their activities. It should be noted that schools in these newly joined provinces have gone through only several months since its initiation at the time of the Mid-Term Review.

(1) Achievements in Northwestern Province

The table below shows the number and percentage of schools that had conducted lesson study activities at least once per term. According to the report submitted by PEST (Northwestern), 72.9% of High Schools and Upper Basic Schools had implemented lessons study, which satisfies the target figure set in the original PDM. It is also

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[1] The indicators marked by [N/A (data are not available)] are not considered in this Mid-Term Review because it was difficult to collect reliable and valid data to verify the achievement of these indicators, or some of them were just duplicates of other indicators. These indicators should be excluded from PDM or modified when it will be revised. This will be discussed further in the Recommendation section.

[2] Ndola, Luansya, Kitwe, Kalulushi, and Mufulira Districts

[3] Solwezi, Mwinilunga, and Kasempa Districts

noticeable that a few Middle/Lower Basic Schools (19 out of 261 schools) have already implemented lesson study even though these schools are not targeted by this programme. Altogether 433 teachers of Grade 1-12 have engaged in lesson study activities so far. In addition, a few teachers from Community Schools and Private Schools have participated in lesson study activities as well.

Number of Schools Implementing Lesson Study
(Northwestern Province, Grade 8 -12)

Type of School	Total No.	Schools implementing LS	%
High Schools	39	38	97.4%
Upper Basic Schools	183	124	67.8%
Total	222	162	72.9%

(Source: PEST report submitted in September 2009)

Concerning Stakeholder Workshops and Facilitators Workshops, several kinds of workshops and meetings have been conducted so far. The details and the number of participants of major events are shown below. As of September 2009, 143 teachers were designated as facilitators. Among them 12 had been trained abroad and greatly contributed to the implementation of these events by sharing their knowledge and skills acquired during such overseas training.

Record of Workshops/Meetings Organized in Northwestern Province
(Mar. 2008 – Sep. 2009)

Name of WS/Meeting	Period	No. of Times	No. of Participants	Contents
DEST Orientation Meetings	Jan.- Feb. 2008	7	105	PEST explained the concept of lesson study to all DESTs
Facilitator Workshop	July 2008	1	155	PEST in collaboration with NEST and PEST (Central) train 155 facilitators
Baseline Survey and Encoding Training	March 2009	4	60	PEST trained DEST in data collection and encoding
Provincial Stakeholders workshop	April 2009	1	185	Give orientation to head teachers, inspectors, administrators, and facilitators
Stakeholder Workshop	Aug.-Sep. 2009	6	451	Progress Reporting
Total		19	956	

(Source: PEST report submitted in September 2009)

(2) Achievements in Copperbelt Province

The table below shows the number and percentage of schools that had conducted lesson study activities at least once per term. According to the report submitted by PEST (Copperbelt), on average 67.1% of High Schools and Upper Basic Schools had implemented lessons study, which is slightly below the target figure set in the original PDM. However, taking five pilot districts that started earlier, namely Ndola, Kitwe, Luanshya, Kalulushi, and Mufulira, the implementation ratio reaches to 90.3% (177 out of 196 High Schools and Upper Basic Schools) have implemented lesson study, which is remarkably high. Since the non-pilot districts have just started lesson study activities since one or two months ago, it requires some time for them to catch up pilot districts. According to the PEST report, 1658 teachers in High Schools and Upper Basic Schools have participated in lesson study activities. Same as in Northwestern Province, a few teachers (21 teachers in total) from Community Schools and Private Schools have participated in lesson study activities as well.

Number of Schools Implementing Lesson Study
(Copperbelt Province, Grade 8 -12)

Type of School	Pilot District		Non-Pilot District		Total		
	No. of Schools	Impl. LS	No. of Schools	Impl. LS	No. of Schools	Impl. LS	%
High Schools	46	42	16	8	62	50	80.6%
Upp. Basic Schools	150	135	80	11	230	146	63.5%
Total	196	177	96	19	292	196	67.1%

(Source: PEST report submitted in September 2009)

Copperbelt Province also has conducted various workshops and meetings to introduce and promote lesson study activities. The details and the number of participants of major events are shown below. As of September 2009, 385 teachers were trained and designated as facilitators, of whom 131 were drawn from High Schools and 232 were drawn from Upper Basic Schools.

Record of Workshops/Meetings Organized in Copperbelt Province
(Mar. 2008 – Sep. 2009)

Name of WS/Meeting	Period	No. of Times	No. of Participants	Contents
Orientation to PEST by NEST and PEST (Central)	Mar. 2008	1	13	All PEST members attended.
Orientation to DEST by PEST	Jun. 2008	1	30	Three DEST members from each district (10 districts) attended.
Induction Workshop (Luanshya District)	Feb. 2009	1	78	Induction of Head teachers and key stakeholders in lesson study
School-Based Training of science and math (Ndola District)	Feb. 2009	2	83	All ZICs and 53 science teachers were trained.
Stakeholder Workshop	Apr. 2009	1	415	
Facilitator Workshop	Aug. 2009	1	244	Building capacity of facilitators and stakeholders of Upper Basic School
District Stakeholder Workshop (Kitwe)	Aug. 2009	1	155	Sharing challenges, successes, lessons learnt
District Facilitator Workshop (Luanshya)	Aug. 2009	1	67	rolling out of lesson study activities to all subject areas
Stakeholder Workshop	Aug. 2009	1	330	DESTs and head teachers are participated for securing commitment from heads.
Total		10	1415	

(Source: PEST report submitted in September 2009)

2-2 Output 2

Lesson study is strengthened in Central Province.

The achievement of this output is verified by the following indicators:

[Coverage]

- ✓ No. and percentage of schools conducting lesson study activities (target figure: 70%).
- ✓ No. of schools newly started conducting lesson study activities. *[N/A[4]]*
- ✓ No. of schools conducting lesson study in subjects other than science.
- ✓ No. of DESTs implementing SW/FWs.
- ✓ No. of monitoring on DESTs by PESTs. *[N/A[5]]*
- ✓ No. of new facilitators.

[Quality]

- ✓ Quality of facilitation skills. *[N/A[6]]*
- ✓ Revised Implementing Guideline. *[N/A, same as the indicator of output1]*
- ✓ Developed facilitators training package. *[N/A[7]]*
- ✓ Revised questionnaire of students. *[N/A[8]]*
- ✓ Developed skills book for facilitators. *[N/A, same as the indicator of output4]]*
- ✓ Lesson study introduced to colleges (PRESET).

Major activities conducted to achieve output 2 (strengthening of lesson study in Central Province) are twofold: (1) activities promoting lesson study in Central Province (to identify resource persons in other subject, to decentralize the responsibility of organizing workshops to district level from provincial level, to develop monitoring format, etc.) and (2) activities strengthening the capacity of PEST (Central) in order for them to technically support newly joined Provinces.

Highlights of major achievements are the followings:

- ✓ 70.9% of High Schools and Upper Basic Schools had implemented lessons study;
- ✓ 158 schools (63.9%) out of 247 schools surveyed had implemented lesson study activities in subjects other than science;
- ✓ all DEST conducted two days District Stakeholder Workshops at least four times

[4] Data are not available for the Review.
[5] Data are not available for the Review.
[6] Data are not available due to the absence of instrument that measures facilitator's skills.
[7] Training contents for facilitators are mostly compiled in Implementation Guidebook and Teaching Skills Book, which are measured by other indicators. Thus, this indicator is not applicable here.
[8] Students' questionnaire has been developed for baseline survey and end-line survey; however, this indicator is not applicable to measure the achievement of output 2.

from March 2008 to September 2009; In 2009, approximately 70% of schools (head teacher and/or deputy head teacher) had attended to 1st and 2nd workshops on average;

- ✓ 45 facilitators have been newly trained in Central Province, which makes number of facilitators 121 in total;
- ✓ Two Colleges of Education in Central Province have incorporated lesson study into their curriculum; and
- ✓ One national level workshop was organized by NEST and PEST (Central) in August 2008 in order to promote lesson study activities in three targeted Provinces, to which 411 facilitators and stakeholders attended.

(1) Activities Promoting Lesson Study in Central Province

High Schools (Grade 10-12) and Upper Basic Schools (Grade 8-9) (or teachers responsible for these grades) in Central Province have been conducting lesson study activities since Phase I. The table below shows the number and percentage of schools that had conducted lesson study activities at least once per term. According to the report submitted by PEST (Central), 70.9% of High Schools and Upper Basic Schools had implemented lessons study, which satisfies the target figure set in the original PDM.

Number of Schools Implementing Lesson Study
(Central Province, Grade 8 -12)

Type of School	Total No.	Schools implementing LS	%
High Schools	29	28	96.6%
Upper Basic Schools	298	204	68.6%
Total	327	232	70.9%

(Source: PEST report submitted in September 2009)

Furthermore, the survey conducted by a JOCV in June 2009 confirmed that 158 schools (63.9%) out of 247 surveyed schools had implemented lesson study activities in subjects other than science. The details are shown in the table below. Although the ratio of schools that had introduced lesson study in subjects other than science varies, the result of this survey supports the applicability of lesson study approach to any subject.

Number of Schools Implementing Lesson Study in Subjects other than Science (Central Province, Grade 8 -12)

District	Total No. of schools	Total No. (Surveyed)	Schools implementing LS in other subjects	%
Chibombo	77	56	38	67.8%
Kabwe	42	42	31	73.8%
Kapiri Mposhi	59	37	20	54.0%
Mkushi	43	37	31	83.7%
Mumbwa	76	75	38	50.6%
Total	327	247	158	63.9%

Note: Serenje District was not included in the survey since the timings of District Workshop in Serenje was overlapped with other Workshop, at which the researcher planned to collect necessary data.

(Source: JOCV report submitted in June 2009)

One of the characteristics of implementing structure in Central Province is that PEST had transferred its responsibility of planning and holding Stakeholder Workshops to DEST since the commencement of Phase II. All DEST conducted two days District Stakeholder Workshops at least four times from March 2008 to September 2009 (Kapiri Mposhi District conducted workshops five times in the same period). All head teachers and deputy head teachers of government schools (High Schools, Upper Basic and Lower/Middle Basic Schools) and facilitators were invited to the District Stakeholder Workshops. In some cases, teachers of Community Schools also attended. The table below shows the actual record of workshops conducted by DEST (number of participants of each workshop and percentage of schools attended). In 2009, approximately 70% of schools (head teacher and/or deputy head teacher) had attended to 1st and 2nd workshops on average. However, some districts (Chibombo, Mumbwa, and Serenje) observed general decrease of attendance ratio from 1st workshop to 2nd workshop in 2009. Several factors may have discouraged stakeholders to attend, for instance;

- ✓ Late announcement may have hindered them to prepare necessary travelling cost in time; and
- ✓ The topics covered may have not responded to the needs of the participants.

It would be necessary for PEST (Central) and NEST to analyse the reason of low attendance in these districts and take necessary measures to improve the management

and contents of District Stakeholder Workshops. For example, PEST and NEST can advise these districts to minimize the number of workshops organized within a year, to squeeze the contents of workshops so that the workshop could be done within one day, and to revise the contents of workshops so as to respond to the actual needs of participants

Record of Workshops Organized by DEST (2009)

District	No. of Participants and attendance ratio	
	1st	2nd
Chibombo	250 (80%)	225 (66%)
Kabwe	236 (98%)	248 (98%)
Kapiri Mposhi	121 (51%)	252 (86%)
Mkushi	283 (73%)	210 (87%)
Mumbwa	292 (82%)	245 (62%)
Serenje	187 (57%)	102 (43%)
Total	1369 (71%)	1282 (71%)

(Source: PEST report submitted in September 2009)

Since the commencement of Phase II, 45 facilitators have been newly trained in Central Province, which makes number of facilitators 121 in total. The majority of facilitators have been given the opportunities of overseas training, either in Japan, Kenya or Malaysia. Therefore, such facilitators have contributed technical inputs to District Stakeholder Workshops by giving presentations on what they have learnt during the overseas training as well as promoted lesson study activities in each school or cluster.

Although it was not included in planned activities of PDM, PEST (Central) member successfully introduced lesson study activities to two Colleges of Education (Malcom Moffat and Mkrumah) in Central Province. As a result of this introductory activity, one College of Education (Malcom Moffat) has been practicing lesson study activities among lecturers of the college and the other College of Education (Mkrumah) has also started practicing lesson study among students.

(2) Activities Supporting Newly Joined Provinces

One national level workshop was organized by NEST and PEST (Central) in August 2008 in order to promote lesson study activities in three targeted provinces, to which 411 facilitators and stakeholders attended. This workshop encouraged all stakeholders in two provinces and pushed them forward to start the preparatory work of lesson study activities, such as a baseline survey. The technical support from PEST (Central) was

effective particularly at the initial stage of introducing lesson study in new provinces so that they could get familiar with the processes of lesson study activities and the usage of monitoring instruments (Lesson Assessment Format, Implementation Monitoring Format, etc.). Apart from the initial orientations, the technical support from PEST (Central) to other provinces was rather limited to ad-hoc basis due to the lack of sufficient budget and the overdependence on the limited number of resource persons.

2-3 Output 3

Lesson study framework is integrated into Grades 1-7 SBCPD based on the experience on Grades 8-12 of Central Province.

The achievement of this output is verified by the following indicators:

- ✓ No. of schools implementing lesson study activities in Grades 1-7 (target figure: 70%).
- ✓ No. of cycles of lesson study activities in Grades 1-7 (target figure: 3 cycles per term). *[N/A[9]]*
- ✓ No. of learning areas integrating lesson study in Grades 1-7.
- ✓ No. of teachers participating in lesson study activities in Grades 1-7. *[N/A[10]]*

Activities under Output 3 intended for teachers responsible for lower grades (Grade 1-7) so that they can also practice lesson study activities based on the experiences of higher grades teachers in Central Province. According to the PEST report as of July 2009, only 90 (or 42.1% on average) out of 214 Middle/Lower Basic Schools had implemented lesson study at least one cycle per term so far, which is still below the target figure. The table below shows the detailed figure of schools implementing lesson study by district. Although the average figure is below the target, the gap between two advantaged districts and three other districts are apparent. It was observed that three districts, namely Mumbwa, Chibombo, and Serenje, showed noticeably low implementation ratio. Since the attendance ratio of District Stakeholder Workshops in these three districts were generally low as mentioned earlier, the low implementation ratio of lesson study activities shown below may indicate that there might be some hindrances in organizing workshops (e.g. late announcement of workshop) and reporting (e.g. school report did not reach to DEST due to its absence from the workshop).

[9] Data are not available for the Review.
[10] Data are not available for the Review.

Number of Schools Implementing Lesson Study
(Central Province, Grade 1-7, by District)

	Kabwe[11]	Kapiri	Mumbwa	Mkushi	Chibombo	Serenje	Total
No. of S	n.a	48	19	40	42	65	214
No. of S impl. LS	n.a	40	3	31	5	11	90
%	n.a	83.3%	15.8%	77.5%	11.9%	16.9%	42.1%

(Source: PEST report submitted in September 2009)

According to the same PEST report, it was found that lesson study was conducted in thirteen (13) learning areas in total, namely English, Literacy, Mathematics, Social Development Study, Community Technology Study, Science, Geography, Civics, History, Chemistry, Religious Education, Zambian Language, and Physical Education. It is clear that Grade 1-7 teachers had well incorporated lesson study activities in the variety of subjects once they got interested in lesson study and realized its effect on the improvement of teaching and learning. Although science was the entry point of lesson study in Central Province, this result also supports the applicability of lesson study to any subjects other than science.

2-4 Output 4

Teaching Skills Book is developed based on the experiences of the three target provinces.

The achievement of this output is verified by the following indicator:

- ✓ Availability of Teaching Skills Book (Approved Teaching Skills Book)

The first edition of Teaching Skills Book was published in August 2009 as planned. Teaching Skills Book will be used as one of the training materials of Stakeholder Workshops and/or Facilitator Workshops, which will be conducted at provincial level (in case of Central Province, at district level). The second edition of Teaching Skills Book will be published in 2010.

[11] Since all Basic Schools in Kabwe run from Grade 1 to 9 and the implementation ratio of lesson study in these schools have been reported in Output 2, earlier section in this report, the same data are not reported here.

2-5 Output 5

Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces.

The achievement of this output is verified by the following indicator:

- ✓ Availability of Management Skills Book (Approved Management Skills Book)

NEST members, with the technical support from Japanese experts, have drafted the first edition of Management Skills Book by August 2009 as planned. The first edition of Management Skills Books will be authorized by the Ministry of Education and published by the end of March 2010. Furthermore, training for education managers on effective management of school-based CPD is planned to be conducted in 2010.

2-6 Output 6

Monitoring of SBCPD is improved in the target provinces.

The achievement of this output is verified by the following indicators:

- ✓ The number of monitoring by external supervisions (NEST, PEST, DEST) *[N/A[12]]*
- ✓ The number of monitoring by implementers (school managers, facilitators and teachers) *[N/A[13]]*
- ✓ The assessment of planned versus implemented activities *[N/A[14]]*
- ✓ Harmonized monitoring instruments
- ✓ Developed common format for monitoring

The various monitoring formats were developed and disseminated to concerned stakeholders. The table below shows the title, user, purpose and contents of each format.

List of Monitoring Formats

Title	User	Purpose and Contents
School-Based CPD Termly School Implementation Report	Head Teacher	• To record the lesson study activities conducted at each school • To be submitted to DEST together with actual lesson plans prepared for lesson demonstrations, reporting the progress of activities, concerns, and self-evaluation.

[12] Data are not available for the Review.
[13] Data are not available for the Review.
[14] This is not appropriate as indicators.

Termly Progress Report of School-Based CPD	PEST, DEST	・ To summarise and analyse the data of "School-Based CPD Termly School Implementation Report" submitted from schools ・ To be submitted to PEST by DEST, and to NEST by PEST
Progress Report Format for NEST Technical Sub-committee Meeting	PEST	・ To summarise such data submitted from DEST to PEST as Implementation of lesson study, number of facilitators, progress of implementation, and record of workshops/meetings/orientations ・ To be submitted to NEST Technical Sub-committee Meeting for reporting
Implementation Monitoring Format (Operational Monitoring)	PEST, DEST	・ To monitor and record the progress of SBCPD by PEST and DEST
Lesson Assessment Format (Technical Monitoring)	PEST, DEST	・ To assess a demonstrated lesson ・ To be shared among teacher group members in the discussion after demo lesson for reflection

The Lesson Assessment Format was revised and has been used for trial in Central Province. From April 2009 to May 2009, PEST (Central), in collaboration with NEST, had conducted workshops for District Resource Centre Coordinators and their assistants of five districts in Central Province so that they could become familiar with data inputs and data analysis work by using MS-Excel. The Lesson Assessment Format was also introduced to Northwestern Province and Copperbelt Province through the workshop conducted by NETS and PEST (Central) in July 2009.

The Progress Report Format for NEST Technical Sub-committee Meeting was recently introduced to summarize the data collected from PESTs that compiled the Termly Progress Report of School-Based CPD. Although NEST members recognize that some part of this format need to be modified for further improvement, the data and information collected by using this format helped the Mid-Term Joint Review Team grasp the general picture of the progress of activities and problems faced by each Province.

IV. Major Findings

The Team observed that the progress of the Project is on the right track. It may take a few months for newly joined schools to fully incorporate lesson study activities into their own SBCPD framework. Once they get understand the benefits of lesson study, however, teachers themselves can continue and advance lesson study activities in their own schools. Some interviewees of successful schools mentioned that lesson study activities have such benefits as; encouraging teachers to prepare a lesson, strengthening team work and sense of unity among teachers, enhancing teachers' confidence in teaching difficult topics, deepening students' comprehension on the topics taught, etc. Since the nature of lesson study is school-based, once a head teacher and teachers understand the significance of lesson study, they can easily adopt the approach with own initiative.

The Team found that the Project activities had been conducted very effectively and efficiently, since this Project fully utilizes the existing framework and organizations of In-Service Training, called SPRINT. The injection of lesson study approach into the existing system in fact revitalized each component of SPRINT, such as Teachers Group Meeting (TGM), Subject Meetings at the Resource Centre (SMARC), etc. Furthermore, the opportunities of overseas training have been strategically allocated to key stakeholders at various levels who have become fully engaged in the Project right after the training.

The major findings by the Team, in terms of quality, management, and monitoring of lesson study, and the unexpected impact of the Project, are summarized below.

1. Quality of Lesson Study

The Team had observed three demo lessons and the reflection meeting after each demo lesson during the field visits. The Team found several strengths and weaknesses of observed lesson study sessions in terms of quality.

✓ **Strengths**

- All lessons observed are different from ordinary lessons, which normally do not allow students to think, express their own ideas, and deepen their understandings.
- Lesson plans were well prepared, which apparently showed that the teachers devoted some time, knowledge, and resources to prepare the lesson.
- All teachers engaged had a sense of ownership over the lesson since the lesson plan was jointly prepared by teachers group.

✓ **Weaknesses**

- The majority of comments in the reflection meeting after the demo lesson only touched apparent and easily observable matters (time management of lesson delivery, preparation of the materials, teacher's utterance, etc.).
- Only a few observers actually took verbatim records of teacher's questions, although such records could be used for critiquing the quality of questions (e.g. whether a specific question was "analysing question" or "understanding question").

2. Management of Lesson Study

All schools observed by the Team were successful schools in terms of implementing lesson study. The Team found the commitment and leadership of head teachers essential for such success. Some good examples of strong leadership of head teachers are mentioned below.

- Lesson study activities are well incorporated into the school calendar, so that teachers can engage in the activities within their normal working hours.
- A head teacher strongly supports teachers to implementing lesson study activities by securing sufficient budget for purchasing necessary teaching materials upon request by teachers, and by assigning senior teachers to take care of other classes during conducting a demo lesson in one class.
- Teachers are encouraged to prepare a lesson plan of every lesson, which is reviewed by a Head teacher before, and in some cases even after, conducting the actual lesson.

In addition to the strong leadership of school managers, a strong commitment of key Education Officers putting the Ministry's policy into practice is crucial as well. It is very important for key Education Officers to understand the significance of SBCPD, which is supported by the Ministry's policy, and take necessary actions to promote it. For example, PEO (Copperbelt) encourages and urges all head teachers to promote SBCPD through lesson study, by issuing a circular that directs head teachers to prioritize the participation in lesson study activities as the first criterion of the recommendation for teachers' promotion.

The Team also noticed that some factors may hinder the advancement of lesson study activities, such as distance among neighbouring schools and insufficient budget allocation to SBCPD. The below is the issues raised by some of the interviewees.

- It is difficult for rural teachers to form a teachers group to conduct lesson study

within their school because number of teachers in same subject is very small (one or two, in case of Grade 8 – 9). Although such teachers need to travel to the core school of own cluster/zone to participate in lesson study, they find it difficult to do so because of the distance, the lack of transport or funds to cover such travel.

- Some facilitators mentioned that they found difficult to secure enough amount of budget for monitoring, since some head teachers think that facilitators' activities supporting other schools should not be borne by own school budget.

Although these issues may surface apparently at the very initial stage of introducing lesson study activities, with a strong commitment of key Education Officers and a strong leadership of school managers, these issues are probably handled in due course.

3. Monitoring of Lesson Study

The Team has found that monitoring (participation in lesson study activities) by external stakeholders is very effective since it can add new views to the improvement of the quality of lessons. Since a demo lesson is prepared by teachers group and normally criticized by the same group, it is probably difficult for them to spot the very weakness of the lesson. In such a case, external monitors can help them review the lesson from the different perspectives.

Concerning the overall monitoring of lesson study activities, various instruments for monitoring were developed and used as mentioned in 2-6 above. The data collected by using these instruments indeed help the Team to understand the overall situation. However, these collected data were used mainly to keep records of implemented activities, not to improve the quality of lesson study or not to give guidance to retarded Province/districts.

4. Unintended Outcome of the Project

The Team found that the Project was achieving intended outputs as planned so far, which have been already reported in the earlier part of this report (III. Achievement of the Project activities and outputs). In addition to these intended outputs, the Team found that the Project had produced several unintended positive outcomes.

- Some Upper Basic Schools in Copperbelt Province and Northwestern Province have already introduced lesson study activities to lower grades (G1-7) or subjects other than science at higher grades (G8-12), even though these grades and subjects are not targeted in this phase of the Project.

- A few Community Schools and Private Schools have already started lesson study activities in their school with the support of DESTs.
- Colleges of Education in Northwestern and Copperbelt Provinces also have incorporated and been practicing lesson study either with their lectures or students.

V. Recommendations

[Measures to be taken by the end of the Project]

1. Continuously Motivating and Strengthening the Capacity of School Heads

- ✓ Commitment to and enthusiasm for lesson study of school heads is one of the most influential factors for the success in school-based CPD. Hence, it is important for school heads to understand the significance and benefits of conducting lesson study.
- ✓ The capacity of school heads in school management should be continuously strengthened including how to allocate budget for school based CPD and how to keep records.
- ✓ In particular, in order to address the issue of insufficient budget for school visits for monitoring, capacity for internal monitoring of school heads, deputy heads, and heads of departments should be further strengthened.
- ✓ Management Handbook should be completed as planned.
- ✓ Acknowledging and sharing good practices of those heads and schools which are earnestly engaged in lesson study may be effective to stimulate those schools which are not.

2. Effective Utilization of Data Collected through Monitoring and Evaluation (M&E)

- ✓ Analyzing data collected through M&E will enable DEST to identify further areas for training for facilitators (Localization of training programmes).
- ✓ Analyzing data also enables PEST to decide which district and schools should be visited for monitoring (Strategic monitoring).

3. Enhancing Quantity and Quality of Facilitators

- ✓ It is necessary to secure the sufficient number of facilitators, for instance, at least one facilitator for each zone. Furthermore, it is recommended to train facilitators where some of them are transferred or left.
- ✓ In order to motivate facilitators, some incentives should be considered such as awarding a certificate.

4. Strengthening Coordination and Supervision at National Level

- ✓ Ministry of Education, in particular, ESS, is expected to play a role of coordination and supervision of School based CPD at national level. In particular, they need to take more responsibility when the lesson study approach is rolled out to nationwide. Hence, it is necessary to further strengthen the capacity of NEST and In-service

Unit, including the increment of the number of staff assigned to the Unit, when the SBCPD would be rolled out. In addition, they need to further strengthen such a capacity as identifying and addressing issues that are difficult to be solved by PEST solely.

- ✓ They also need to familiarize themselves with issues that schools are facing by sometimes visiting schools and observing lesson study activities.
- ✓ Collaboration with the Directorate of Standards and Curriculum is suggested to be strengthened in order to deal with technical issues such as curriculum, subject contents, and quality of learning at national level.

5. Some Ideas for Improving the Quality of Discussion and Reflection of Lesson

- ✓ Discussion should be based on evidence and facts, not interpretation. For instance, actual questions and pupils responses need to be recorded. It may be interesting to collect pupils' comments for reflection meeting.
- ✓ For those schools which have gained enough experience, it is suggested to decide a specific theme for reflection meeting for the further enhancement of the quality of lesson study.
- ✓ A lesson observation format should be developed which is more concise and easy to fill in at school level.
- ✓ In the future, it is also recommended to monitor the quality of reflection meeting, for instance, how much comments are to do with improving the quality of lessons.

6. Revision of PDM

Some of the indicators stipulated in the PDM are not appropriate to be used for evaluation. For example, some of the indicators are not necessarily relevant to the actual activities. Target values of some indicators are also not determined. The details are shown in ANNEX 12. The NEST Technical Sub-committee is recommended to modify irrelevant indicators by March 2010. The Team recommended that the indicators of each output would be minimized.

[Measures to be taken for the further advancement of school based CPD and future cooperation of JICA]

1. Finalization of the Master Plan

It is crucial that the Master Plan for Strategic Expansion and Implementation of School-based Continuing Professional Development (SBCPD) programme (2010-2023) should be finalized and authorized.

2. SBCPD Budget for Roll-out

At the same time, it is essential that the sufficient budget at national level should be allocated to SBCPD for nationwide rolling out. Furthermore, the Ministry headquarters should supervise whether education offices at provincial and district levels and schools allocate sufficient amount of budget for the implementation of SBCPD.

ANNEX 1 Detailed Schedule during the Stay of JICA Mission Team

	Date		Team A: Ndola (Sugawara & Shimoda)	Team B: Solwezi (Matachi & Nakai)	Accommodation
1	9/30	Wed	16:00 Courtesy call on JICA RR		Lusaka
2	10/1	Thu	09:00 Courtesy call on Embassy of Japan 11:30 Meeting with Representatives of NEST 14:00 Courtesy call on Ministry of Education officials (PS and Director) 15:00-17:00 Move to Central Province		Kabwe
3	10/2	Fri	08:15 Visit Provincial PEO - Kabwe 09:00 Courtesy call on PS- Kabwe 09:30 Observation of Lesson Study 12:00 Interview to Teachers paricipating Lesson Study 14:00-16:00 Interview to PEST/DEST 16:30-19:00 Move to Lusaka		Lusaka
4	10/3	Sat	Report Writing		Lusaka
5	10/4	Sun	Report Writing		Lusaka
6	10/5	Mon	**Team A: Ndola** 09:00 Move to Copperbelt Province 14:00 Visit Provincial PEO - Ndola 14:30-16:30 Interview to PEST/DEST	**Team B: Solwezi** 09:00-17:00 Team B: Move to Northwestern Province	A:Ndola B:Solwezi
7	10/6	Tue	**Team A: Ndola** 08:30 Observation of Lesson Study 14:00-16:00 Move to Lusaka	**Team B: Solwezi** 08:30 Visit Provincial PEO - Solwezi 09:30 Observation of Lesson Study 14:00-16:00 Interview to PEST/DEST 16:00-19:00 Move to Kitwe	A:Lusaka B:Kitwe
8	10/7	Wed	**Team A: Ndola** 09:00-14:00 Drafting of Minutes 15:00-20:00 Internal Meeting & Drafting of Minutes	**Team B: Solwezi** 08:00-14:00 Move to Lusaka	Lusaka
9	10/8	Thu	09:00-11:30 Drafting of Minutes & Preparation of Presentation 12:00-17:00 Meeting w/ NEST for Joint Review work		Lusaka
10	10/9	Fri	09:00-12:00 Drafting of Minutes (Final Draft) 16:00 Report to Embassy of Japan 17:00 Report to JICA RR		Lusaka
11	10/10	Sat	10:00 Signing on M/M 11:00-12:00 Meeting with NEST for future Cooperation		Lusaka
12	10/11	Sun	07:15 Departure of Mission SA067		

ANNEX 2 The List of Interviewees

Office of the President Provincial Administration Central Province

Lumbama Denny	Permanent Secretary

Ministry of Education

James S. Mulungushi (Dr.)	Permanent Secretary, Education Services, Standard, and Curriculum
Ruth M. Muganba	Director, ESS
Esvah Chizambe	Acting Principal Education Officer (In-service), ESS
Kunda D.	Acting Principal Education Officer (Pre-service), ESS
Kebby K. Kayombo	Senior Education Officer (Basic Schools), ESS
Gibson B. Chola	Senior Education Officer (High Schools), ESS
Rabecca M. Twelasi	SBCPD Secretary, National Science Centre

[Central Province]

Ngoma Paul	Provincial Education Officer
Simatende Martin	Principal Education Standards Officer
Zulu Peter. M.	Senior Education Standard Officer (Natural Science)
Florence Mwandila	Acting Education Officer (Teacher Education)
Richard Singoyi	Provincial Resource Center Coordinator
K.C. Lungwe	Acting Principal, Nkrumah College of Education
Kayira M.	Education Standards Officer, Kabwe District
Osinald Yabilimba	Head Teacher, Neem Tree Basic School, Kabwe District
Mwiko M.Z.	Head Teacher, Nkwashi Basic School, Kabwe District
Chiyamba R.M.	Deputy Head Teacher, Nkwashi Basic School, Kabwe District
Lungu Mateyo	Senior Teacher, Nkwashi Basic School, Kabwe District
Munshta Leonard	Senior Teacher, Nkwashi Basic School, Kabwe District
Clavec Bwalta	Senior Teacher, Nkwashi Basic School, Kabwe District
A. M. Mulenga	Class Teacher (Grade 7), Nkwashi Basic School, Kabwe District
H. Mukoshta	Class Teacher (Grade 7), Nkwashi Basic School, Kabwe District
Chabala. N.	Class Teacher (Grade 7), Nkwashi Basic School, Kabwe District
Yubana Violet	Class Teacher (Grade 1), Nkwashi Basic School, Kabwe District
Mukonka Geoffrey	Zone In-Service Coordinator, Nkwashi Basic School, Kabwe District

[Copperbelt Province]

Valentine Yumba	Senior Education Standards Officer (Open and Distance Learning)
Joseph Musonda	Senior Education Standards Officer (Mathematics)

Charles Chisanga	Acting Education Officer, Teacher Education
Mwlambia Jennifer	Provincial Resource Centre Coordinator, Ndola
Chiwala J Mwape	Provincial Resource Centre Coordinator, Copperbelt-South
Chiwala J.M.	Provincial Resource Centre Coordinator, Copperbelt-South
Grace K.C. Chilekwa	Acting Principal, Kitwe College of Education
Alex K. Tumeo	Senior Lecture, Copperbelt College of Education
Tebeka John	Senior Lecture, Mufulira College of Education
Alexander M. Mulenga	District Education Board Secretary, Ndola District
T. Kalumba	Assistant District Resource Centre Coordinator, Ndola District
Abbia C. Mwamba	Acting Assistant District Resource Centre Coordinator, Ndola District
Mwale Henry	District Education Standards Officer, Masaiti District
Malambo Dkson	Acting Assistant District Resource Centre Coordinator, Masaiti District
Kanga Patrick	District Education Standards Officer, Mpongwe District
Zulu Kalonde	Assistant District Resource Centre Coordinator, Mpongwe District
Benson Musyani	Acting District Education Standards Officer, Chingola District
Elizabeth Mwila Ngosa	District Resource Centre Coordinator, Chingola District
Paul Mulenga	Acting District Education Standards Officer, Chililabombwe District
Imelda Mwamba S.	Acting District Resource Centre Coordinator, Chililabombwe District
Kulelwa N. Hilda	District Education Standards Officer, Kitwe District
Chibesa Jessy	District Resource Centre Coordinator, Kitwe District
Mwape K. Rosemary	District Education Standards Officer, Luanshya District
Liseli Maswana	District Resource Centre Coordinator, Luanshya District
Mupanda Hazel M.	Head Teacher, Temweni High School, Ndola District
Lupuwga C. Elizabeth	Acting Deputy Head, Dominican Convent High School, Ndola District
Mpundu, Kennedy	Facilitator/Class Teacher, Masala High School, Ndola District
Chiteme, Bertha	Facilitator/Class Teacher, Ndola District
Makulu James	Facilitator/Class Teacher, Ndola District

[Northwestern Province]

Lingambe Allan	Principal Education Standards Officer
Mulenga Sylvester	Acting Senior Education Standards Officer (Natural Science),
Lindunda Z. N.	Acting Senior Education Standards Officer (Practical Subjects)
Florida Hampondela	Senior Education Standards Officer (Mathematics)
Rodgers Kapyololo	Education Officer, Teacher Education
Kambungu Evelyn	Provincial Resource Center Coordinator – Basic School
Lukama L.N.	Acting Provincial Resource Center Coorinator – High School

Mutobo Andrew	Principal, Solwezi College of Education
Fredrick Munkinyi	District Education Board Secretary, Solwezi District
Mondew Collins	District Education Standards Officer/Facilitator, Solwezi District
Kasangula Webby	Education Standards Officer (Special Education), Solwezi District
Malichi M. Kyombe	District Resource Center Coordinator, Solwezi District
David Mulila	Facilitator/Class Teacher, Solwezi District
Nkowe Fred	Facilitator/Class Teacher, Solwezi District
Chewe Lazarous	Facilitator, Solwezi District
Kyembe Jonathan	Planning Officer, Solwezi District
Lalley Amanda	Peace Corps Volunteer, US Peace Corps, Solwezi District
Ngazhi M.	Acting Head Teacher, Solwezi Day High School
Mandanda M.	Acting Deputy Head Teacher, Solwezi Day High School
Michael Chirwa Mumba	Class Teacher, Solwezi Day High School
Mukinda Erick	Class Teacher, Solwezi Day High School
Mulenga Michael	Class Teacher, Solwezi Day High School
Lukama John	Class Teacher, Solwezi Day High School
Kutela Davious	Class Teacher, Solwezi Day High School
Lursha Danny	Class Teacher, Solwezi Day High School

Embassy of Japan

H.E. Hideto Mitamura	Ambassador
Hitoshi Suzuki	Second Secretary

JICA Zambia Office

Shiro Nabeya	Chief Representative
Hajime Fukuda	Representative
John Chileshe	Senior Education Consultant

JICA Experts

Kazuyoshi Nakai	Long-term Expert (Lesson Study and INSET Management)
Asami Shimoda	Long-term Expert (Coordination and Monitoring of Lesson Study Activities)

ANNEX 3 : Project Design Matrix

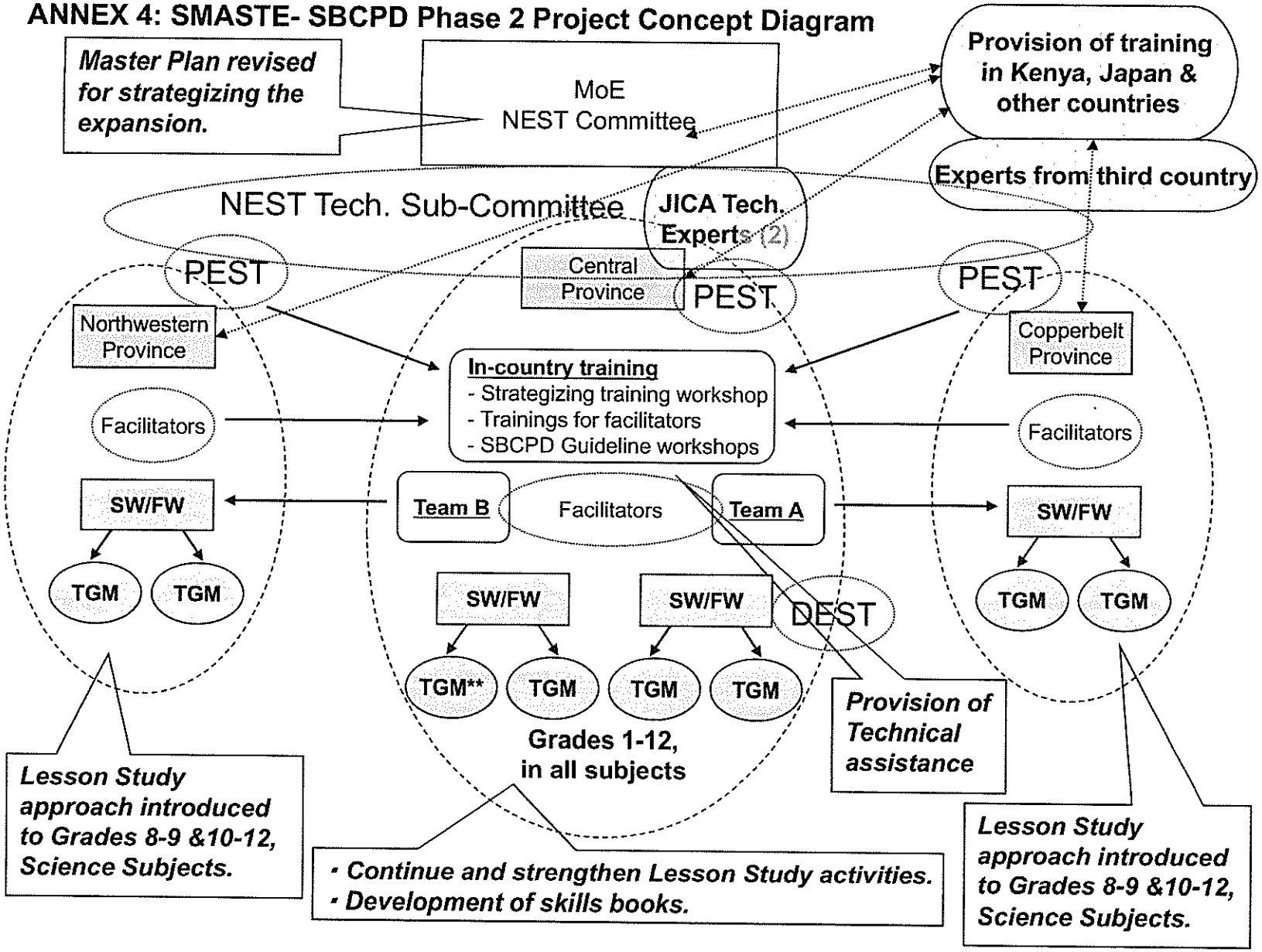
Name of the Project: SMASTE School-Based CPD Phase 2
Executing Bodies: Ministry of Education and JICA
Target Area: Central Province, Copperbelt Province and Northwestern Province
Target Group: Science teachers for Grades 8-12 in Copperbelt Province and Northwestern Province
Teachers for Grades 1-12 in Central Province

Duration of the Project: Feb 2008 - Feb 2011
Version No.: PDM_1
Date: May 11th, 2009

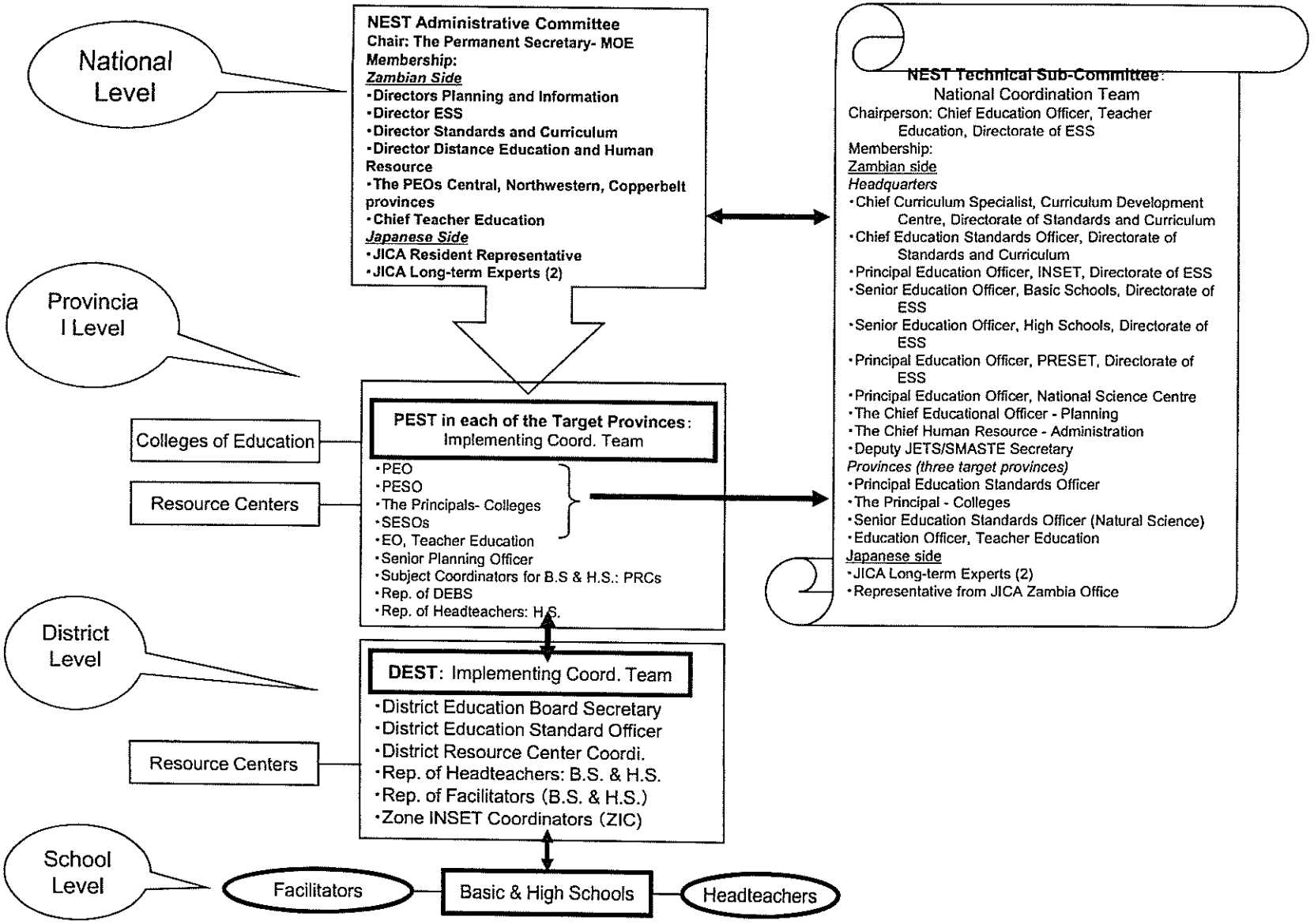
Narrative Summary	Objectively verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Sustainable School Based Continuing Professional Development (SBCPD) through Lesson Study is extended to the rest of the country.	1. Implementation guidelines being used. 2. Lesson study activities being conducted regularly. 3. Master plan on SBCPD modified.	1. CPD Workplan 2. CPD Report	
Project Purpose Teaching/learning activities in the classroom are improved through lesson study in three target provinces.	**Central Province** 1. Improved observation results of the lessons. 2. Improved Students' perception of the lessons. 3. Improved School managers' perception of the Lessons. 4. Improved Teachers' perception of their Lessons. (Northwestern Province and Copperbelt Province) 1. Observation results of the lessons. 2. Students' perception of the lessons. 3. School managers' perception of the Lessons. 4. Teachers' perception of their Lessons.	1. Report of lesson observation. 2. Result of questionnaire to the pupils/students. 3. Result of questionnaire to the school managers. 4. Result of questionnaire to the teachers.	
Outputs 1. Lesson study activities in science are introduced to schools at Grades 8 to 12 in Northwestern Province and Copperbelt Province.	1-1. No. of schools in the piloting districts participating in lesson study activities (target figure: 70%). 1-2. No. of school managers who participate in SW/FWs (target figure: 70%). 1-3. No. of cycles of lesson study activities in a school/cluster (target figure: 3 cycles per term). 1-4. No. of teachers participating in lesson study activities. 1-5. No. of facilitators in SW/FWs. 1-6. The revised Implementing Guideline.	1-1. Monitoring reports from schools. 1-2. Plan on School-based CPD from schools. 1-3. Attendance records on SW/FWs.	
2. Lesson study is strengthened in Central Province.	**Coverage** 2-1. No.and percentage of schools conducting lesson study activities (target figure: 70%). 2-2. No. of schools newly started conducting lesson study activities. 2-3. No. of schools conducting lesson study in subjects other than science. 2-4. No. of DESTs implementing SW/FWs. 2-5. No. of monitoring on DESTs by PESTs. 2-6. No. of new facilitators. **Quality** 2-7. Quality of facilitation skills. 2-8. Revised Implementing Guideline. 2-9. Developed facilitators training package. 2-10. Revised questionnaire of students. 2-11. Developed skills book for facilitators. 2-12. Lesson study introduced to colleges (PRESET).	2-1. Results of questionnaires to the teachers. 2-2. Results of questionnaires to education managers. 2-3. Monitoring reports from schools. 2-4. Attendance records on SW/FWs. 2-5. Results of observation by external observers.	
3. Lesson Study framework is integrated into Grades 1-7 SB CPD based on the experience on Grades 8-12 of Central Province.	3-1. No. of schools implementing lesson study activities in Grades 1-7 (target figure: 70%). 3-2. No. of cycles of lesson study activities in Grades 1-7 (target figure: 3 cycles per term). 3-3. No. of learning areas integrating lesson study in Grades 1-7. 3-4. No. of teachers participating in lesson study activities in Grades 1-7.	3-1. Monitoring reports from schools. 3-2. Plan on School-based CPD from schools. 3-3. Attendance records on SW/FWs. 3-4. School In-service Record (SIR) Book (Grades 1-9)	
4. Teaching Skills Book is developed based on the experiences of the three target provinces.	4-1. Availability of teaching skills book.	4-1. Approved teaching skills book	
5. Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces.	5-1. Availability of management skills book.	5-1. Approved management skills book	
6. Monitoring of SBCPD is improved in the target provinces.	6-1. The number of monitoring by external supervisions (NEST, PEST, DEST) 6-2. The number of monitoring by implementers (school managers, facilitators and teachers) 6-3. The assessment of planned versus implemented activities. 6-4. Harmonized monitoring instruments. 6-5. Developed common format for monitoring	6-1. Monitoring report by external supervisors. 6-2. Monitoring report from schools. 6-3. Numbers of achieved activities. 6-4. My Monitoring Book (Grades 1-9).	

Activities		
1-1. Review the School-based CPD of SPRINT-CPD. 1-2. Develop the strategy for scaling of SBCPD within the provinces. 1-3. Conduct needs assessment (No. of zone/clusters, No. of schools, No of target teachers, No. of pupils, information on staffing, etc.). 1-4. PESTs attend the Strategizing Workshop and develop Plan of Operation (P/O). 1-5. Train facilitators (in-country and outside country). 1-6. Conduct Stakeholder Workshops. 1-7. Conduct Facilitators Workshops. 1-8. Conduct lesson study activities as school-based CPD at school/cluster level. 2-1. Conduct needs assessment (including identify the resource persons of other subjects for FWs). 2-2. Conduct the orientation meeting for PEST. 2-3. Conduct meeting among DESTs and PEST. 2-4. Conduct Stakeholders Workshop at district level. 2-5. Conduct Facilitators Workshop. 2-6. Conduct training of District of Facilitators. 2-7. Identify some facilitators as potential national trainers. 2-8. Strengthen the capacity of selected facilitators as national trainers. 2-9. Conduct lesson study activities as school-based CPD at school/cluster level. 2-10. Provide the technical assistance to Copperbelt and Northwestern Province. 2-11. Develop the monitoring format and lesson assessment format for other subjects. 3-1. Harmonize the existing classroom teaching interventions with lesson study. 3-2. Train facilitators (in-country and outside country) 3-3. Conduct Stakeholder Workshops. 3-4. Conduct Facilitators Workshops. 3-5. Conduct lesson study activities as school-based CPD at school/cluster level. 4-1. Identify and select suitable content for the teaching skills book. 4-2. Identify the writers of the teaching skills book. 4-3. Conduct teaching skills book development workshop. 4-4. Produce teaching skills book. 4-5. Conduct dissemination workshop on the use of the teaching skills books for the target provinces. 5-1. Identify and select suitable content for the management skills book (manual). 5-2. Identify the writers of the management skills book. 5-3. Conduct the management skills book development workshop. 5-4. Conduct training for Education Managers on effective management of school-based CPD. 5-5. Produce the management skills book. 5-6. Conduct dissemination workshop on the use of the management skills book for the target provinces. 6-1. Develop, revise and harmonize monitoring instruments for effective school monitoring. 6-2. Identify a monitoring team spear-headed by standard officers 6-3. Conduct training on how to use the lesson study implementation report. 6-4. Conduct training on the use of the monitoring instrument. 6-5. Strengthen the use of the monitoring instruments and implementation reports. 6-6. Develop a common format for summary reports.	**Japanese side** • Dispatch of long-term experts: Lesson Study and INSET Management/Coordination and Monitoring of Lesson Study Activities and INSET • Dispatch of third country short-term experts • Provision of training opportunities for education managers and teachers in other countries (including airfares for international travel, transportation outside the country, meals and accomodation) The rest of the training costs will be borne by the Zambian side. • Procurement of equipment (vehicle, printing equipment, PCs etc.) and materials • Local costs for the experts • Costs of local expertise when necessary (e.g. for in-country training). **Zambian side** • Counterpart personnel • Office facilities (at Headquarters and in targeted provinces) and running costs • Costs for in-country training • Funds for conducting lesson study activities and workshops • Buildings and other facilities necessary for conducting Lesson Study activities and workshops • Funds to be allocated to Central Province for technical assistance to Northwestern Province and Copperbelt Province.	**Preconditions** ・Zambian Government policy for strengthening and implementing CPD activities of teachers does not change adversely. ・There is not too much transfers of core officers. ・There will be good political will. ・Ministry of Education budget is sustained.

ANNEX 4: SMASTE- SBCPD Phase 2 Project Concept Diagram



ANNEX 5: Organization Chart of the Project



ANNEX 6:

List of the Assigned Core Counterparts

No.	Name	Profession	Position	From	To
1	Ruth M. Mubanga (Mrs.)	Director - Teacher Education & Specialised Services	Project Manager (National)	Feb. 2008	present
2	Paul Ngoma (Mr.)	Provincial Education Officer, Central Province	Project Manager (Provincial)	Feb. 2008	present
3	Muyangwa Kamutumwa (Mr.)	Provincial Education Officer, Copperbelt Province	Project Manager (Provincial)	Feb. 2008	May 2009
4	J. H.Siwingwa (Mr.)	Provincial Education Officer, Copperbelt Province	Project Manager (Provincial)	June 2009	present
5	Jenipher Malama (Mrs.)	Provincial Education Officer, Northwestern Province	Project Manager (Provincial)	Feb. 2008	present
6	Ronald Kaulule (Mr.)	Chief Edcuation Officer - Teacher Education Dept.	Project Coordinator (National)	Feb. 2008	Dec. 2008
7	James Silwimba (Mr.)	Chief Edcuation Officer - Teacher Education Dept.	Project Coordinator (National)	Jan. 2009	present
8	Edward Tindi (Mr.)	Principal Education Officer, In-service - Teacher Education Dept.	Project Adiministrator (National)	Feb. 2008	Dec.2008
9	Esvah Chizambe (Ms.)	Principal Education Officer, In-service - Teacher Education Dept.	Project Adiministrator (National)	Jan. 2009	present
10	Esvah Chizambe (Ms.)	Senior Education Officer - Resource Center	NEST Tech. Sub-committee member	Feb. 2008	Dec.2008
11	Gibson B. Chola (Mr.)	Senior Education Officer - High School	NEST Tech. Sub-committee member	Feb. 2008	present
12	Kebby K. Kayombo (Mr.)	Senior Education Officer - Basic School	NEST Tech. Sub-committee member	Feb. 2008	present
13	M. Simatende (Mr.)	Provincial Education Standards Officer, Central Province	NEST Tech. Sub-committee member	Feb. 2008	present
14	Tabeth C. Chisanga (Mrs.)	Provincial Education Standards Officer, Copperbelt Province	NEST Tech. Sub-committee member	Feb. 2008	present
15	Allan Lingambe (Mr.)	Provincial Education Standards Officer, Northwestern Province	NEST Tech. Sub-committee member	Feb. 2008	present
16	Benson Banda (Mr.)	Principal Education Officer, National Science Center	NEST Tech. Sub-committee member	Oct. 2008	present
17	Rabbecah Twelasi (Mrs.)	SMASTE/JETS Administrative Secretary, National Science Center	NEST Tech. Sub-committee member	Feb. 2008	present
18	Benson Banda (Mr.)	Senior Education Standards Officer - Natural Science, Central Province	Project Coordinator (Provincial)	Feb. 2008	Sep. 2008
19	Peter. M. Zulu (Mr.)	Senior Education Standards Officer - Natural Science, Central Province	Project Coordinator (Provincial)	Oct. 2008	present
20	Alexander Mulenga (Mr.)	Senior Education Standards Officer - Natural Science, Copperbelt Province	Project Coordinator (Provincial)	Feb. 2008	Mar. 2009
21	Chikalekale F.M. (Mrs.)	Senior Education Standards Officer - Natural Science, Copperbelt Province	Project Coordinator (Provincial)	Apr. 2009	present
22	Allan Lingambe (Mr.)	Senior Education Standards Officer - Natural Science, Northwestern Province	Project Coordinator (Provincial)	Feb. 2008	Dec. 2008
23	S. Mulenga (Mr.)	Senior Education Standards Officer - Natural Science, Northwestern Province	Project Coordinator (Provincial)	Jan. 2009	present
24	Bessie Tembo (Ms.)	Education Officer - Teacher Education, Central Province	Project Administrator (Provincial)	Feb. 2008	Mar. 2009
25	Harris Kabwe (Mr.)	Education Officer - Teacher Education, Central Province	Project Administrator (Provincial)	Apr. 2009	Jul. 2009
26	F. Mwandila (Ms.)	Education Officer - Teacher Education, Central Province	Project Administrator (Provincial)	Aug. 2009	present
27	K. Mwale (Mr.)	Education Officer - Teacher Education, Copperbelt Province	Project Administrator (Provincial)	Feb. 2008	Mar. 2009
28	Charles A. Chisanga (Mr.)	Education Officer - Teacher Education, Copperbelt Province	Project Administrator (Provincial)	Apr. 2009	present
29	Rodgers Kapyololo (Mr.)	Education Officer - Teacher Education, Northwestern Province	Project Administrator (Provincial)	Feb. 2008	present

ANNEX 7:

Financial Input from Zambian Government (from 26 Feb. 2008 to 30 Sep. 2009)

1. National Level:

No.	Item	Average Amount per Event	No. of Event Conducted	Sub Total (ZMK)
1	Conduct of Facilitators Workshops (Sep. 2008)	145,000,000.00	1	145,000,000.00
2	Monitoring Activities	7,000,000.00	5	35,000,000.00
3	Conduct of NEST Administrative Committee meeting	1,500,000.00	1	1,500,000.00
3	Conduct of NEST Technical Sub-committee meeting	3,000,000.00	7	21,000,000.00
			Total in Zambian Kwacha	202,500,000.00

2. Provincial Level (Total of 3 provinces):

No.	Item	Average Amount per Event	No. of Event Conducted	Sub Total (ZMK)
1	Conduct of Stakeholders' & Facilitators Workshops	6,000,000.00	16	96,000,000.00
2	Monitoring Activities	2,500,000.00	30	75,000,000.00
3	Conduct of PEST meetings	500,000.00	30	15,000,000.00
4	Conduct of meetings/workshops at/for Colleges	1,500,000.00	16	24,000,000.00
5	Participation in Nnational level meetings	2,000,000.00	8	16,000,000.00
			Total in Zambian Kwacha	226,000,000.00

3. District, Cluster, Zone, School Level

No.	Item	Average Amount per Event	No. of Event Conducted	Sub Total (ZMK)
1	Conduct of Stakehoders' Workshops	3,000,000.00	44	132,000,000.00
2	Conduct of DEST meetings	200,000.00	115	23,000,000.00
3	Monitoring Activities	1,000,000.00	115	115,000,000.00
4	Participation in National & Provincial level meetings/workshops	500,000.00	3,900	1,950,000,000.00
5	Conduct of Lesson Study Activities*	100,000.00	3,400	340,000,000.00
			Total in Zambian Kwacha	2,428,000,000.00

Overall Total (ZMK): 2,856,500,000

Overrall Total (JPY): ¥54,273,500.00

* The amounts are estimated based on the number of workshops/meeting and their participants.
* All the items include expenses for fuels, consumables, subsistances & allowances of staffs.
* The amount for Lesson Study Activities is based on the estimation (680 schools × Average 5 cycles).

ANNEX 8:

Building and other Facilities

1.Building and other Facilities Necessary for the Project

No.	Building/Facilities	Venue
1	Ministry of Education , Curriculum Develop Centre	Office space for JICA Expert
2	National Science Centre	Office space for JICA Expert
3	Provincial Education Office, Central Province	Office space for JICA Expert
4	2 Provincial Resource Centers, Kabwe & Serenje , Central Province	Venue for Joint Technical Committee Meetings
5	2 Provincial Resource Centers, Ndola & Kitwe, Copperbelt Province	Venue for Joint Technical Committee Meetings
6	1 Provincial Resource Centers, Solwezi , North Westen Province	Venue for Joint Technical Committee Meetings
7	2 College & 5 Schools, Central Province	Venue for Stakeholders' & Facilitators' Workshops
8	3 College & 5 Schools, Copperbelt Province	Venue for Stakeholders' & Facilitators' Workshops
9	1 College & 6 Schools, Northwestern Province	Venue for Stakeholders' & Facilitators' Workshops
10	6 District Resource Centers, Central Province	Venue for District Workshops
11	10 District Resource Centers, Copperbelt Province	Venue for District Workshops
12	7 District Resource Centers, North Wesren Province	Venue for District Workshops
13	89 Zone Resource Centers, Central Province	Venue for Zonal Workshops
14	79 Zone Resource Centers, Copperbelt Province	Venue for Zonal Workshops
15	92 Zone Resource Centers, NorthWeatern Province	Venue for Zonal Workshops
16	28 High, 204 Upper Basic & 90 Basic Schools, Central Province	Venue for Lesson Study Activities of Teachers
17	50 High & 146 Upper Basic Schools, Copperbelt Province	Venue for Lesson Study Activities of Teachers
18	38 High & 124 Upper Basic Schools, North Weatern Province	Venue for Lesson Study Activities of Teachers

ANNEX 9:

List of Japanese Expert

No.	Name	Title	From	To
1	Kazuyoshi NAKAI (Mr.)	Lesson Study and INSET Management	12 Mar. 2008	11 Mar. 2010
2	Asami SHIMODA (Ms.)	Coordination and Monitoring Lesson Study Activities	23 Jul.2009	25 Feb. 2011

ANNEX 10-1:

Counterpart Training in Japan

JFY	Name of Course	From	To	No.	Name of Participants	Profession	Institution/School	Province/Org.	Present Position
2008	Improvement of School Management in Sub-Saharan Africa	10-Sep-08	21-Oct-08	1	Ms. Maseka, Dorothy	DEBS, Mwinilunga	DEBS Office	North Western	Unchanged
				2	Ms. Chunda, Loyce	Headteacher	Kanyihampa Basic School	North Western	Unchanged
	Secondary Education Development	6-Oct-08	8-Nov-08	3	Mr. Haakanene, Dominic	DESO, Chibombo	DEBS Office	Central	Unchanged
	Educational Evaluation and Monitoring	23-Oct-08	14-Nov-08	4	Ms. Chilekwa, Grace	Vice Principal	Mufulira College of Ed.	Copperbelt	Acting Principal Muf
	INSET Management	17-Nov-08	19-Dec-08	5	Ms. Chizambe, Esvah	SEO, Resource Center	TED, MOE-HQ	NEST	Unchanged
	Training Program for Young Leaders (Education)	27-Jan-09	13-Feb-08	6	Mr. Mulenga, Michael	Teacher (HOD)	Solwezi Day High School	North Western	Unchanged
				7	Mr. Mazimba, Jonathan	Teacher	Kasempa Boys High School	North Western	Unchanged
				8	Ms. Chiteme, Bertha	Teacher	Malela High School	Copperbelt	Unchanged
				9	Mr. Mpundu, Kennedy	Teacher	Masala High School	Copperbelt	Unchanged
	Strengthening of Local Education for SMASE-WECSA for Sub-Saharan Africa	13-Jan-09	14-Feb-08	10	Ms. Mapanda, Hazel	Headteacher	Temineni High School	Copperbelt	Unchanged
				11	Mr. Mugwagwa, Givern	Headteacher	Mwinilunga High School	North Western	Unchanged

ANNEX 10-2:

Third Country Training

JFY	Venue	Name of Course	From	To	No.	Name of Participants	Profession	Institution/School	Province/Org.	Present Position
2008	Kenya	ASEI/PDSI approach in Secondary Mathematics and Science Education (Group 10)	3-Nov-09	28-Nov-08	1	Ms. Simunyola, Catherine	PRCC, Kitwe	PRC	Copperbelt	Unchanged
					2	Ms. Ngulube, Moreen	Teacher	Jasmine Boys High School	Central	Unchanged
					3	Mr. Sakayombo, Joseph	Lecturer	Malcom Moffat College	Central	Mufulira College of Ed. Copperbelt
					4	Mr. Kabubi, Vincent	Teacher	Lunga Day High School	North Western	Unchanged
					5	Ms. Moya, Prudence	Teacher	Kansenshi High School	Copperbelt	Unchanged
					6	Ms. Salwanja, Vumbi	Teacher	Solwezi Tech. High School	North Western	Unchanged
					7	Mr. Kalaba, Stephen	Teacher	Helen Kaunda High School	Copperbelt	Unchanged
					8	Ms. Mamlundu, Carol	Teacher	Kasempa Basic School	North Western	Unchanged
		ASEI/PDSI approach in Secondary Mathematics and Science Education (Group 8)	14-Jan-09	8-Feb-08	9	Mr. Kayombo, Kebby	SEO, Basic School	TED, MOE-HQ	NEST	Unchanged
					10	Mr. Chama, Shila	DESO, Kabwe	DEBS Office	Central	Unchanged
					11	Mr. Mulenga, Alexander	SESO-NS	MOE-Copperbelt	Copperbelt	DEBS Ndola
					12	Mr. Munkinyi, Fredrick	DEBS, Solwezi	DEBS Office	North Western	Unchanged
					13	Ms. Chirwa, Esnart	Deputy Headteacher	Mine Basic School	Central	Unchanged
					14	Mr. Kapanga, Kelly	DRCC, Mumbwa	DEBS Office	Central	Unchanged
					15	Mr. Tebeka, John	Lecturer	Malcom Moffat College	Central	Mufulira College of Ed. Copperbelt
					16	Ms. Hampondela, Floridah	SESO-Math	MOE-North Western	North Western	Unchanged
					17	Ms. Shichela, Georgina	Lecturer	Nkrumah College of Ed.	Central	Unchanged
	Malaysia	Training for Science and Mathematics Educators (Customised for Teachers in Uganda, Nigeria and Zambia)	4-Aug-08	29-Aug-08	18	Mr. Mudenda, Vincent	Lecturer	Nkrumah College of Ed.	Central	Unchanged
					19	Ms. Kapumpa, Grace	Teacher	Mwayasunka Basic School	Central	Unchanged
					20	Ms. Mushani, Mercy	Teacher	Kasolo Basic School	Central	Unchanged
		Secondary Science and Mathematics Teacher Educators Training for African Countires	6-Oct-08	31-Oct-08	21	Mr. Tumeo, Alex	Senior Lecturer	COSETCO	Copperbelt	Unchanged
					22	Mr. Kabaso, Johnies	Senior Lecturer	Malcom Moffat College	Central	Unchanged
					23	Ms. Poho, Kamavu Prisca	ZIC, Solwezi	Solwzi Basic School	North Western	Unchanged

ANNEX 10-3:

Technical Exchange Program

JFY	Venue	Name of Course	From	To	No.	Name of Participants	Profession	Institution/School	Province/Org.	Present Position
2008	Uganda	Technical Exchange Workshop between Zambia and Uganda on School-Based In-service Teacher Education	19-Oct-08	25-Oct-08	1	Mr.Edward Tindi	PEO	MOE-HQ Teacher Education	NEST	VVOB consultant
					2	Mr.Benson Banda	PEO	National Science Centre	NEST	Long-term Training in Japan (2 years) '09.Sep-'11.Oct
					3	Ms.Bessie Tembo	Education Officer	P.E.O.'s office	Central	Master Course in Zambia (2 years)
		Secondary Science and Mathematics Teacher's Programme (SESEMAT) International Workshop	22-Mar-09	28-Mar-09	4	Mr.Charles Chisanga	PRCC	Ndola PRC	Copperbelt	E.O. TED at P.E.Os Office
					5	Mr.Machiko Visto Zacharia	PRCC	Kabwe PRC	Central	Unchanged
					6	Ms.Mervis Makayi Michelo	DRCC	Kasempa DRC	NorthWestern	Unchanged
					7	Mr.Gibson Chola	SEO High School	MOE-HQ Teacher Education	NEST	Unchanged

ANNEX 11:

List of Machinery and Equipment

Ministry of Education HQ

Place	JFY	Equipment	Manufacturer	Model Number	Unit Cost	Quantity	Total Cost(ZMK)
HQ	Mar.2008	Desktop PC	HP Compaq	DX2300	3,600,000	1	3,600,000
	Mar.2008	Computer Printer	HP	LaserJet2015	1,695,574	1	1,695,574
	Mar.2008	LCD projector	SONY	VPL-ES4	5,262,000	2	10,524,000
	Jan.2009	Printer	HP	DX3500	3,440,000	1	3,440,000
						Phase2 Total in Zambian Kwacha	19,259,574

Central Province

Place	JFY	Equipment	Manufacturer	Model Number	Unit Cost	Quantity	Total Cost(ZMK)
Transferred from Project Phase1							
Provincial Education Office	Oct.200	4X4 Vehicle	TOYOTA	Land Cruiser S/W 1HG	149,104,953	1	149,104,953
	Mar.200	LCD projector	SONY	VPL-ES2	6,297,872	1	6,297,872
	Jun.2006	Laser Jet Printer	HP	LaserJet 1320	1,531,915	1	1,531,915
Procured in Project Phase 2							
Provincial Education Office	Mar.2008	Desktop PC	HP Compaq	DX2300	3,600,000	1	3,600,000
						Phase2 Total in Zambian Kwacha	3,600,000

Copperbelt Province

Place	JFY	Equipment	Manufacturer	Model Number	Unit Cost	Quantity	Total Cost(ZMK)
Provincial Education Office	Mar.2008	Laptop PC	HP	6710B	5,000,000	1	5,000,000
	Mar.2008	Computer Printer	HP	LaserJet2015	1,695,574	1	1,695,574
	Mar.2008	LCD projector	SONY	VPL-ES4	5,262,000	1	5,262,000
	Dec.2008	4X4 Vehicle	Mitsubishi	L200 Pick-up	*95,370,000	1	95,370,000
						Phase2 Total in Zambian Kwacha	107,327,574

*$=¥95.37、¥=0.021Kwacha (JICA regulated rate in Dec. 2008)

North Western Province

Place	JFY	Equipment	Manufacturer	Model Number	Unit Cost	Quantity	Total Cost(ZMK)
Provincial Education Office	Mar.2008	Laptop PC	HP	6710B	5,000,000	1	5,000,000
	Mar.2008	Computer Printer	HP	LaserJet2015	1,695,574	1	1,695,574
	Mar.2008	LCD projector	SONY	VPL-ES4	5,262,000	1	5,262,000
	Dec.2008	4X4 Vehicle	Mitsubishi	L200 Pick-up	*95,370,000	1	95,370,000
						Phase2 Total in Zambian Kwacha	107,327,574

*$=¥95.37、¥=0.021Kwacha (JICA regulated rate in Dec. 2008)

Phase2 Total in Zambian Kwacha	237,514,722
Phase2 Total in ¥*	4,512,780

*¥=0.019Kwacha (JICA regulated rate in Aug. 2009)

ANNEX 12: Recommended Indicators to be Modified

Output1. Lesson study activities in science are introduced to schools at Grades 8 to 12 in Northwestern Province and Copperbelt Province.

Original PDM	Issues observed	Recommendations
1-1. No. of schools in the piloting districts participating in lesson study activities (target figure: 70%).	-	-
1-2. No. of school managers who participate in SW/FWs (target figure: 70%).	Relevant data were not collected since the lists of participants of SW/FW did not distinguish their positions.	Proposed modification: "Percentage of schools that participate in SW/FWs"
1-3. No. of cycles of lesson study activities in a school/cluster (target figure: 3 cycles per term).	Relevant data were not collected.	Combine with 1-1. as these two indicators measures same aspect (quantity and frequency) of lesson study implementation.
1-4. No. of teachers participating in lesson study activities.	-	-
1-5. No. of facilitators in SW/FWs.	same as 1-2	Proposed modification: "No. of facilitators who were trained and assigned as facilitators"
1-6. The revised Implementing Guideline.	Deadline is not defined.	Proposed modification: "Implementing Guideline is revised by ** 2010."

Output2: Lesson study is strengthened in Central Province.

Original PDM	Issues observed	Recommendations
<u>Coverage</u>		
2-1. No.and percentage of schools conducting lesson study activities (target figure: 70%).	-	-

2-2. No. of schools newly started conducting lesson study activities.	Relevant data were not collected since the list of schools implementing lesson study was not available.	Delete
2-3. No. of schools conducting lesson study in subjects other than science.	-	-
2-4. No. of DESTs implementing SW/FWs.	-	-
2-5. No. of monitoring on DESTs by PESTs.	Relevant data were not available since the monitoring has been conducted several ways and the progress report format should be revised so that it can capture the monitoring activities actually done.	Delete or modify
2-6. No. of new facilitators.	-	-
Quality		
2-7. Quality of facilitation skills.	Relevant data were not available since an instrument measuring the quality of facilitation skills has not yet developed.	Revise this according to the instruments to be developed.
2-8. Revised Implementing Guideline.	Duplication with 1-6.	Delete
2-9. Developed facilitators training package.	Corresponding activities were not conducted.	Delete
2-10. Revised questionnaire of students.	Corresponding activities were not conducted.	Delete this as this indicator is measuring same items as the indicator for Project Purpose.
2-11. Developed skills book for facilitators.	Duplication with 4.	Delete
2-12. Lesson study introduced to colleges (PRESET).	Corresponding activities were not mentioned in the PDM	Add related activities

Output3: Lesson Study framework is integrated into Grades 1-7 SB CPD based on the experience on Grades 8-12 of Central Province.

Original PDM	Issues observed	Recommendations
3-1. No. of schools implementing lesson study activities in Grades 1-7 (target figure: 70%).	-	-
3-2. No. of cycles of lesson study activities in Grades 1-7 (target figure: 3 cycles per term).	Relevant data were not collected.	Combine with 3-1. as these two indicators measures same aspect (quantity and frequency) of lesson study implementation.
3-3. No. of learning areas integrating lesson study in Grades 1-7.	-	-
3-4. No. of teachers participating in lesson study activities in Grades 1-7.	Relevant data were not collected.	

Output4: Teaching Skills Book is developed based on the experiences of the three target provinces.

No problems are observed.

Output5: Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces.

No problems are observed.

Output6: Monitoring of SBCPD is improved in the target provinces.

Original PDM	Issues observed	Recommendations
6-1. The number of monitoring by external supervisions (NEST, PEST, DEST)	Relevant data were not available since the monitoring has been conducted in several ways.	Proposed modification: "Progress Report for NEST Technical Sub-committee Meeting is compiled termly basis."
6-2. The number of monitoring by implementers (school managers, facilitators and teachers)	Relevant data were not available since the monitoring has been conducted in several ways.	Delete
6-3. The assessment of planned versus implemented activities.	Not appropriate as indicators	Delete
6-4. Harmonized monitoring instruments.	-	Combine 6-4. and 6-5 into one indicator since these two measure same thing.
6-5. Developed common format for monitoring	-	Combine 6-4. and 6-5 into one indicator since these two measure same thing.

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REPUBLIC OF ZAMBIA

MINISTRY OF FINANCE AND NATIONAL PLANNING

CHIMANGA ROAD
P.O. BOX 50062
LUSAKA

MFAL/101/07/099 TJ

11th February, 2010

Mr. Shiro Nabeya
Resident Representative
Japan International Cooperation Agency
LUSAKA

RE: MASTER PLAN FOR THE STRATEGIC EXPANSION OF SCHOOL- BASED CONTINUING PROFESSIONAL DEVELOPMENT

The above subject refers.

The Ministry of Education working in Collaboration with your Agency has implemented the Strengthening Mathematics, Science and Technology Education (SMASTE) School-Based Continuing Professional Development(SBCPD) through Lesson Study project. The main aim of the project is to improve the practice of teachers using the Lesson Study Approach.

JICA started supporting this project in 2005 before being rolled out to North Western and Copperbelt Provinces in 2008.There are plans to roll out this project to the remaining six (6) Provinces of Zambia in 2011.To this effect, a 'Master Plan for the Strategic Expansion and Implementation of SBCPD Programme 2010-2023' has been developed. The Master Plan highlights the key strategies that will be used to expand the project using the experience gained in the pilot provinces and the current In-service for the Term (SPRINT).We consider this project to contribute greatly to improvement in teaching and learning as teachers' capacity will be built as a result.

Find attached the Master Plan for your consideration and subsequent submission to JICA Tokyo office.

The Government of Zambia is grateful for your continued support in the area of education.

Justin C. Mubanga
Director Economic Management Department
For/ Permanent secretary (Budget and Economic Affairs)
MINISTRY OF FINANCE AND NATIONAL PLANNING

c.c : The Permanent Secretary
Standards and Curriculum
Ministry of Education
LUSAKA

Republic of Zambia

Ministry of Education

MASTER PLAN
FOR STRATEGIC EXPANSION AND IMPLEMENTATION OF SCHOOL-BASED CONTINUING PROFESSIONAL DEVELOPMENT (SBCPD) PROGRAMME 2010 – 2023

Contents:

Abbreviations

AIEMS	Action to Improve English, Mathematics and Science
ASEI/PDSI	ASEI = Activity, Student, Experiment and Improvisation; PDSI = Plan, Do, See, Improve
BEDMAS	Bachelor of Education in Mathematics and Science
BESSIP	Basic Education Sub-Sector Investment Programme
CHANGES	Community Health and Nutrition, Gender and Education Support Program
CPD	Continuous Professional Development
DEST	District Education Support Team
DRCC	District Resource Centre Coordinator
EEC	European Economic Commission
EO-TE	Education Officer-Teacher Education
EQUIP	Educational Quality Improvement Program
FNDP	Fifth National Development Plan
GRZ	Government of the Republic of Zambia
HIM	Head Teacher's In-service Meeting
GRACE	Grade Meeting at the Resource Centre
HOTS	Higher Order Thinking Skills
INSET	In-Service Training
JICA	Japan International Cooperation Agency
MARK	Mathematics Rainbow Kit (MARK
MoE	Ministry of Education
NBTL	National Breakthrough to Literacy
NEST	National Education Support Team
NIF	National Implementation Framework
NISTCOL	National In-Service Training College
NSC	National Science Centre
PAGE	Programme for the Advancement of Girls' Education
PEST	Provincial Education Support Team
PRCC	Provincial Resource Centre Coordinator
PRP	Primary Reading Programme
PTDDL	Primary Teachers' Diploma by Distance Learning
ROC	Read On Course
SBCPD	School Based Continuous Professional Development
SIMON	School In-Service and Monitoring

SIR Book	School In-Service Record Book
SITE	Step Into English
SMARC	Subject Meetings at the Resource Centre
SMASE-WECSA	Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa
SMASTE	Strengthening of Mathematics, Science and Technology Education
SPRINT	School Programme of In-service for the Term
TGM	Teacher Group Meeting
TICC	Teacher In-Service Credit Card
TRC	Teacher Resource Centre
UNZA	University of Zambia
USAID	United States Agency for International Development
VVOB	Flemish Association for Development Co-operation and Technical Assistance
ZAMISE	Zambia Institute of Special Education
ZAMSTEP	Zambia Mathematics and Science Teacher Education Programme
ZIC	Zonal Inset Coordinator

1. Background

The Zambian people's vision is to become ***"A Prosperous Middle Income Nation by 2030".*** By 2030, Zambians, aspire to live in a strong and dynamic middle-income industrial nation that provides opportunities for improving the well being of all, embodying values of socioeconomic justice, underpinned by the principles of: (i) gender responsive sustainable development; (ii) democracy; (iii) respect for human rights; (iv) good traditional and family values; (v) positive attitude towards work; (vi) peaceful coexistence and; (vii) private-public partnerships.

The Ministry of Education attaches great importance to this vision which can be achieved through the provision of quality education. Key to this are issues of curriculum design and standards, teacher education, human resource development and careful planning of initiatives and programmes aimed at equipping citizens with necessary skills and competences to drive the engines of prosperity forward. Programmes so developed should be relevant and responding to societal needs. Programmes that have a focus on improving the practice of teaching and learning should carefully be developed at both levels of initial teacher preparation and actual practice at school level. Thus quality education is of central importance to enhancing economic and social development.

Continuing Professional Development (CPD) and the School Programme of In-Service for the Term (SPRINT)

CPD is birthed by a desire to fulfil or attain quality education for development and innovations and reforms all over the world are being implemented in a quest to improve the quality of education and respond to the changing needs of a globalising knowledge society. CPD is an on-going process of education, training, learning and support activities which take place in either external or work-based settings and engaged in by qualified, educational professionals. It is aimed mainly at promoting learning and development of their professional knowledge, skills and values

In direct response to the provision of quality education, reform efforts have focused on designing strategies to promote Continuing Professional Development (CPD) for all levels of staff in the Ministry of Education. The Ministry of Education has further streamlined CPD through the establishment of a system of in-service called the School Programme of In-service for the Term (SPRINT). The SPRINT is a system through which all CPD innovations and activities are implemented at school level. Because CPD is vitally important it is reflected in the National Implementation Framework (NIF) and the Fifth National Development Plan (FNDP) and its objective is 'to strengthen the systems for continuous professional development, management and support' which is already done through the establishment of the SPRINT system.

Although great milestones have been attained in the implementation of CPD through the SPRINT system, numerous challenges have been encountered. Some of the challenges reflected in the National Assessment Surveys have revealed the low learning achievements at school level. In an attempt to improve the quality of education and improve the learning gains, a number of programmes and initiatives have been

implemented using project-type approaches through SPRINT encouraging teachers to share in teacher groups. Some of the efforts include:

a) The Primary Reading Programme (PRP) Courses namely the Zambian New Break Through to Literacy (ZNBTL); Read on Course (ROC) and the Step into English (SITE).
The Primary Reading Programme (PRP) represents a new national literacy strategy for Zambia, following some research and piloting of potential approaches in teaching initial literacy. The primary purpose of the PRP was to address the extremely low literacy levels recorded in the country's basic schools through the teaching of literacy in the seven Zambian languages as well as in English to all children of eligible school age. In order to achieve the main objective of the programme, a three pronged approach was adopted as follows:

- Children acquire basic literacy skills in a familiar language in Grade 1;
- Children then transfer these skills into English in Grade 2;
- Children extend these vital literacy skills in Grade 3 to 7 in both English and Zambian Languages and gain access to better learning in the entire curriculum.

b) Mathematics Rainbow Kit (MARK)
The Mathematics Rainbow Kit (MARK) was developed within the Primary Reading Programme in order to address the low levels of numeracy. Through the MARK, teachers were supported with skills and resources to make the learning of numeracy in Middle Basic Schools interesting, fun, active, collaborative and easy

c) Bachelor of Education in Mathematics and Science Project (BEDMAS)
The BEDMAS project began in 1998 as a partnership between UNZA school of Education, MoE and the Belgian government to provide a three year in-service undergraduate degree programme for non-graduate secondary mathematics and science teachers, in order to increase the number of graduate teachers of these subjects in Zambian schools.

d) Primary Teachers' Diploma by Distance Learning (PTDDL)
The PTDDL is a College based distance learning programme for primary school teachers which are aimed at upgrading and retaining Grade 1-7 teachers. The programme envisions improved teacher competency and quality education.

e) Zambia Mathematics and Science Education Project (ZAMSTEP)
In 1988, the Ministry of Education (MoE) in conjunction with the European Economic Commission (EEC) started the Zambia Mathematics and Science Teacher Education project (ZAMSTEP) an advanced diploma program to upgrade the content, knowledge and pedagogical skills of non-graduate mathematics and science teachers to enable them teach mathematics and science effectively at senior secondary level.

f) Action to Improve English, Mathematics and Science (AIEMS)
The AIEMS process began in 1994 in order to improve the quality of teaching and learning of English, Mathematics and Science through a decentralised structure for in-service teacher education and developed durable mechanisms for materials provision at the primary and secondary levels. The project also worked towards the achievement of equity of access for women and men and boys and girls.

All these initiatives were designed and implemented to respond to emerging needs and improve the quality of education at school level. The SMASTE SBCPD programme is equally designed to respond to the need of improving the quality of education and ultimately contribute to the attainment of vision 2030.

2. Overview of Teacher Education Programmes

The Ministry of Education offers pre-service and in-service courses at various levels of education including Universities and Teachers' Resource Centres. The objectives of the Teacher Education Programme include the following:

a) To review and implement appropriate methodologies and technologies to strengthen the systems for initial teacher training, management and support;

b) To expand the capacity of teacher education training (with particular focus at graduate teachers) through the public sector whilst providing incentives to private sector participation;

c) To review and implement appropriate methodologies and technologies to strengthen the systems for continuing professional development, management and support; and

d) To review and implement appropriate methodologies and technologies in the areas of delivery of services targeting Learners with Special Educational Needs (LSEN); guidance and Counselling Services to schools and institutions of higher learning; science and technology in learning institutions ; and the provision of Library Services to schools, communities and institutions of higher learning.

Pre-service Programmes

There are several pre-service institutions which offer initial teacher training at certificate, diploma and degree levels. The courses offered include the Zambia Teacher Education (certificate) Course (ZATEC) , Primary and Secondary Diploma Courses, and Degree courses which are offered at university level

Currently, teacher education training does not meet the demand for teachers at various levels within the education delivery system. This problem is more acute at high school where, officially, teachers are expected to have a degree qualification in their teaching subjects but in practice only 12% of them possess this level of qualification. The majority have a diploma, either in primary or secondary education. More acute is the shortage of qualified teachers of mathematics and science. In high schools as of 2006, only 147 graduate teachers were qualified to teach mathematics, and only 120 qualified to teach science.

Degree courses in education are offered at the University of Zambia (UNZA) and the Zambian Open University which trains teachers using the Distance Education mode. It is noteworthy that the national output of graduate teachers is only half what is required at high school level to meet the demand. In addition, the Copperbelt University has began offering a degree course for Science teachers and two Colleges of Education have been transformed into universities and have began offering degree programmes.

In-service Programmes

In line with Educating Our Future policy (1996), the Ministry of Education in Zambia recognises that the Education of teachers is a continuing process which should go on throughout one's teaching life. Although the initial pre-service training may be adequate and sound as a starting point, it will never be sufficient for life.

Teachers, therefore, have a responsibility to themselves and to their profession to deepen their knowledge, extend their professional skills and to keep up-to-date with major developments affecting their profession. Thus, teaching is said to be both a learned and a learning profession.

The Ministry does recognise the fact that any vital education system is not static, but rather dynamic. It is one that promotes change, responds to the needs and expectations of society. This change could be in the area of subject content, pedagogy, guidance and counselling for pupils, school management and many more.

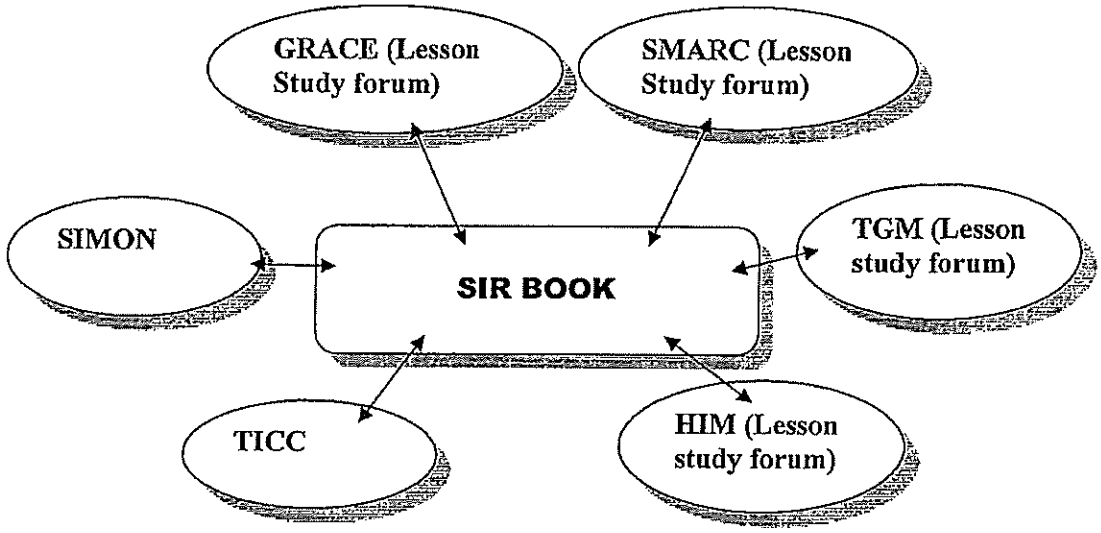
In trying to meet the diverse needs of teachers for continuing professional and personal development, a strategic approach will be adopted which embodies a number of basic principles such as:

1. Programmes will be demand driven, responding to identified needs;
2. The majority of in-service programmes will focus on teachers' and school needs and that such be based in schools (School-Based Continuing Professional Development (SBCPD) and supported by Teachers' Resource Centres (TRCs);
3. Cost effective programmes that will reach large numbers at minimum cost will be a priority;

3. SPRINT as a Framework for School-Based CPD

As a way of accelerating and decentralising operations, the School Programme of In-service for the Term (SPRINT) was introduced in Zambia in 1996. This was introduced to avoid duplicity of intervention and streamlining the operations of in-service provision. SPRINT is a purely school based system of continuous professional development for teachers based in schools and supported by teacher Resource Centres and In-service providers. The system involves small teacher group meetings that meet on a regular basis to discuss professional issues.

The recently adapted lesson study approach has fitted perfectly as a mechanism to strengthen SPRINT in both basic and high schools. Below is a diagrammatic representation and explanation of the components of SPRINT:



School In-service Monitoring (SIMON) is a regular in-service monitoring programme conducted by Standards Officers, Resource Centre Coordinators (RCC) Zone INSET Coordinators (ZIC) and School INSET Coordinators (SIC) in a term.

The Teacher In-service Credit Card (TICC) is a card on which credits a teacher accrues for attending or facilitating at Teacher Group Meetings (TGM) are recorded.

Subject Meetings at the Resource Centre (SMARC): In SMARC, teachers of the same subject meet to discuss various issues in their subject areas.

Grade Meeting at the Resource Centre (GRACE): under GRACE, teachers handling the same grades meet to discuss issues related to a particular grade.

Teacher Group Meeting (TGM): in TGMs, teachers of different subjects and grades meet to discuss different issues of common interest.

The Head Teacher's In-service Meeting (HIM) is any meeting held by the Head teacher to review, and plan for the school in-service activities.

The School In-Service Record (SIR is a record book in which all SPRINT activities are recorded.

Strengths and Characteristics of SPRINT

- Many teachers are reached on a continuous basis at minimum cost.
- It ensures minimum disturbance of the learning of pupils, since training takes place in schools or resource centres nearby.
- The focus is on improving teaching and learning in the classroom in which teachers act as agents of change.
- Once established, it promotes mutual and collaborative learning
- Capacities of teachers and head teachers are developed simultaneously.
- The SBCPD program emphasizes a paradigm shift:
    i. from "top-down" to "bottom-up"
    ii. from teachers "being recipients" to being "main facilitators" in CPD
    iii. from perceiving workshops as a source of income to source of knowledge

Challenges of SPRINT

- In-service provision has been decentralized and there are abvious disparities in terms of implementation of the programme from district to district, zone to zone and school to school
- There are no resources committed at school level to implement the programme hence the difficulties experienced during implementation
- Lack of support by head teachers
- Poor attitudes towards local in-service activities

4. Strengthening Mathematics, Science and Technology Education (SMASTE)

SMASTE is a JICA-supported programme aimed at improving the quality of teaching science and mathematics, essentially through the lesson study approach. The project began in 2005 as a pilot in Central Province. During the pilot phase, the project focussed on supporting the professional development of Grade 8 to 12 science and mathematics teachers.

MoE has taken lesson study as an important intervention which has added value and fitted into the SPRINT system of in-service. It is for this reason that MoE has found it necessary to extend lesson study to all the subjects and all grades. This is currently being implemented in Central, Copperbelt and North Western Provinces before rolling out to the rest of the country.

SBCPD through lesson study is a participatory methodology in which teachers corroboratively study and develop lessons. The focus is on subject content enhancement and teaching methodology in which the content to be discussed is dependent on the

individual needs of teachers and schools. The CPD activities are included in the annual work plan and budgets.

5. Zambia's model of Lesson Study

The Lesson study approach is a redesigned model of Japan and the Philippine's School-Based Training Programme (SBTP). The modifications were made in order to contextualise the approach within the Zambian school context. This model is an appropriate approach for building the capacity of teachers teaching mathematics and science in upper basic and high schools who do not have the minimum stipulated qualifications to teach at these levels.

Lesson study is an approach that teachers use to collaborate, develop and design lessons while examining successful teaching strategies which enhance student learning. One teacher implements the lesson in a real classroom while others observe and take notes on the quality of the lesson. The group then comes together to discuss their observations so that the improved lesson can be re-taught in another class. Finally, the teachers produce a report of what they have learnt from the lesson, particularly with respect to their observation focus.

The development of an "ideal lesson" is not the main aim in the lesson study but the focus is on student learning and professional collaboration. Evaluation of lesson study shows that collaboration of teachers, through the use of lesson study groups, increases learner achievement and decreases teacher isolation. Hence, Zambia has fully embraced lesson study as a critical approach for building capacities of teachers.

6. Implementing Lesson Study through the SPRINT Framework for SBCPD

The Lesson Study approach was implemented in order to strengthen the SPRINT programme. The following are the key areas in which the lesson study approach strengthens in-service training:

1. Collaborative problem solving. The platforms for this kind of collaboration are SMARC, GRACE and TGMs.
2. Exploration of ways of developing good classroom practices and promoting quality teaching to enhance pupil performance and participation.
3. Building confidence in teachers to handle difficult content.
4. Strengthening teachers' pedagogical skills.

The monitoring of the SBCPD through lesson study uses the SIMON. There are two (2) kinds of monitoring, namely internal and external. Internal monitoring is performed by officers within the institution while external monitoring is conducted by officers from the Zone, District, Provincial and National levels. During monitoring an institution is assessed to a certain the quality, impact and success of implementation of the SBCPD Lesson study.

Although this system has been operational, there is a need to enhance the capacity of staff at various levels to sharpen their assessment and analytical skills to carryout effective monitoring in institutions of learning. The National In-Service Training College (NISTCOL) will work with Colleges of Education and TRCs to ensure that head teachers are adequately trained through the Education Leadership and Management course. The current monitoring instruments/tools developed under the SBCPD through lesson study, should be reviewed to suit the demands of phase 3f implementation and align them with the Education Leadership and Management course and other CPD activities.

7. Master Plan for Strategic Expansion of SBCPD

The Master Plan for the SBCPD highlights the following activities:

- Stage I (2006 – 2009): Establishment of model and guidelines
- Stage II (2009 – 2012): Upgrading of content and skills through the development of the teaching skills book and the management skills book in consultation with NISTCOL
- Stage III (2013 – 2017): Use of skills book to improve CPD in schools and colleges
- Stage IV (2018 – 2023): Application of skills books in schools, districts and by teachers

Other activities include event hosting and participation in the SMASE-WECSA Conference, exchange programmes, 3rd country training, education leadership and management training, SBCPD through lesson study integrated in Colleges of Education including NISTCOL and the National Science Centre as centres of excellence and inclusion of community schools in lesson study activities.

Expected outcomes through the programme is improved teaching and learning across the curriculum with Mathematics and Science as entry points and enhanced instructional leadership and management at all levels of the education sector.

With the introduction of short and long term continuing professional development courses/programmes and the provision of management and leadership training for the different levels of personnel in Ministry of Education (and other government departments), there will be improved quality of teaching/learning and improved performance in management and leadership in institutions. The training will promote a positive work culture and change of attitude towards work.

8. Strategies for Rolling Out

In order to ensure effective implementation of the Lesson Study Approach to the remaining six (6) provinces, the strategies outlined below will be employed. This will entail bringing on board all phase I and II stakeholders to share their experiences in the implementation of lesson study in the pilot provinces. It is hoped that as teachers interact and share such experiences, they would sharpen their pedagogical and instructional skills for enhanced teaching and learning.

The role-out will be implemented as follows:

1. *Orientation of Standards Officers, PEST, DEST and other levels of implementation*
   This will be done at various levels beginning with orientation of Standards Officers by the NEST in collaboration with representatives from PEST in Central, Copperbelt and North Western Provinces. The other orientation programmes will be conducted by individual provinces. The three provinces implementing lesson study will be tasked to support two new provinces each. Central province will support and take responsibility for assisting implementation of activities in Southern and Northern provinces; the Copperbelt Province will support Lusaka and Eastern provinces, while North Western province will support Western and Luapula Provinces. However, the final decision on how this will work will be made during the phase III program formulation.

2. *Introduction of Lesson Study Approach into the SPRINT framework*
   Provincial Strategies of implementation – School level Planning and Implementation
   PEST in each province in liaison with NEST and DEST will strategise on how to introduce lesson study approach into the SPRINT framework. Strategies and criteria for selecting facilitators, capacity building of facilitators, orienting school head teachers and teachers will be discussed and planned.

3. *Selection of Lesson Study facilitators and Facilitator Training (Capacity Building) and induction programmes for newly appointed teachers.*
   Facilitators will be selected and assigned in each zone or school following the design of implementation plan. The selection will be done by DEST and PEST.

4. *Planning and Conducting Management Training*
   The planning and capacity development for head teachers will be implemented concurrently with the Facilitator training. This training is aimed at building the capacities of head teachers to effectively and more efficiently support CPD activities at school level.
5. *Conduct of 1st Stakeholders/Facilitators workshop in each province*
   The 1st workshop will be held for head teachers, deputy heads and facilitators at Provincial workshops. PESTs and DESTs will coordinate the conduct of the workshops. The proposed items for training each stakeholder is shown in the Appendix.

6. *Introduction of Lesson Study in schools in each province*
   As soon as schools make termly implementation plan, they will start conducting lesson study as their CPD at school.

7. *Monitoring and assistance to schools by PEST and DEST in coordination with NEST and supporting provinces*
   PEST and DEST will be tasked to conduct monitoring activities and provide assistance to the schools so that the activities can be done effectively according to SBCPD Implementation Guidelines.

In parallel with rolling-out to all the provinces, the following activities have to be done especially in the first three provinces to extend the benefit of the programme and upgrade the quality of implementation.

A. In Central Province, all Government (GRZ) high and basic schools introduce lesson study as school-based CPD in all the subject areas.

B. In Copperbelt and North Western Provinces, lesson study activities will be extended to all GRZ high and basic schools (Grades 1-12) in all subject areas.

C. Colleges of Education will introduce lesson study as CPD activity for their lecturers, while lecturers will also attend and technically support lesson study activities at high and basic schools.

MoE realises that the task of rolling out of SBCPD s challenging and has to be considered carefully. Among the major issues to be addressed will be the role that NEST will play in ensuring that adequate support is given to all the provinces. One key strategic point is to review the Ministry's existing structure in order to strengthen the capacities of NEST, PEST and DEST.

Other strategies will include the following:

a) Training of Core Personnel

The importance of training stakeholders at the different levels of the education system cannot be over-emphasised because the success of any innovation depends on the involvement of key stakeholders and management.

In the current School-Based Continuing Professional Development through Lesson Study training programme, the training of stakeholders is well structured through stakeholders' workshops. These workshops take place at suitable venues in schools, resource centres or colleges of education during every school holiday. School-Based CPD activities such as Teacher Group Meetings (TGM) are conducted regularly in respective schools during school terms. The workshops and School-Based CPD which are conducted in the school term form a basic INSET cycle of a learning module. Therefore, six (6) cycles in two years are considered as one (1) learning module. The main activities comprise Stakeholders' Workshops, Facilitators Workshop and Cluster (GRACE) or School-Based CPD (TGM) which are held once a term.

Participants to these workshops include Facilitators, Heads of Department, Senior Teachers, Deputy Head Teachers and Head Teachers. Facilitation and monitoring are done by the officers at the Provincial Education Office (PEO) and the District Education Board Secretaries (DEBS) in line with specified objectives for that particular training.

Objectives for Deputy Head Teacher Training centre on:

- Strengthening of their knowledge and competences in the implementation of the SBCPD activities and on
- Consolidating progress reporting on SBCPD activities

Objectives for Head Teacher Training centre on:

- Strengthening of their knowledge and competences in the management of schools including teacher professional development through SBCPD activities
- Exchanging information an experiences on school management
- Consolidation of the school development report.

The expansion of the programme should, therefore, not only focus on locally organised training programmes as outlined above, but should in addition work closely with the National In-service Training College (NISTCOL), National Science Centre (NSC), Teacher Resource Centres (TRCs), Colleges of Education and the Universities in the country. NISTCOL has launched the Education Leadership and Management course which is intended for all head teachers in the education sector. The schools will in turn reap benefits from this programme since the issue of management of institution has been identified as critical to the success of educational innovations.

b) NISTCOL and NSC as Centres of Excellence

Research shows that one of the factors influencing school effectiveness is the nature and quality of the leadership and management provided by each head teacher. The prevailing situation in most of the schools is far from the Ministry of Education's expectation of excellence in the way that schools are run. The Ministry's policy document - Educating Our Future notes that '... *excellence is not something that happens to a school; it is something that must be deliberately and painstakingly created and maintained ...'* (MoE, 1996:159).

The quality of teaching and learning has been of great concern to government and members of the public at large. This condition is made worse due to an absence of capacity development opportunities for equipping workers in the Ministry with appropriate competences for enhanced performance. The strategies for addressing this challenge include:

a) sharpening the pedagogical competences and research skills
b) Upgrading professional and academic qualifications of teachers through strengthened continuing professional development courses.
c) Providing management and leadership training has skeleton staff as of now, it has infrastructure to enable it to transform into a Centre of Excellence immediately.

In a bid to address the above, the Ministry of Education plans to establish a Centre of Excellence for Continuing Professional Development (CPD) at the National In-service Training College (NISTCOL). The Centre of Excellence will develop, organize and manage the provision of continuing professional development (CPD) for all levels of personnel in the Ministry of Education and other government departments.

The courses to be offered will help to sharpen the pedagogical competences, upgrade professional qualifications of teachers. The courses will also enhance the training of teachers and other education personnel in ICT, research, *guidance and counselling* and other relevant educational skills. The head teachers and different personnel will be equipped with leadership and management skills

The roles that TRCs have been performing in the SBCPD need to continue, however, in the master plan they will be linked to the National In-service Training College and the National Science Centre in the delivery of CPD. The TRC existing infrastructure should be expanded and fully equipped so as to increase access for teachers to CPD programmes. In addition, all CPD efforts in tertiary institutions other than TRCs and NISTCOL should be harnessed and managed more effectively so that schools receive adequate pedagogical support.

NSC will f strengthens knowledge and skills of teachers in Science, Mathematics and Technological subjects. In addition, NSC will contribute to teachers professional development at school level by providing teaching materials such as Mobile laboratory produced at its own workshop.

Currently the constraints of NSC are a limited capacity for conducting continuous activities both in training of teachers and producing necessary materials. To this effect, the Ministry of education is reviewing its structures and NSC is included. Further the Ministry intends to upgrade the infrastructure at NSC, in order to accelerate the implementation of quality Science Mathematics and Technology (SMT) subjects in schools. The NSC will be upgraded by constructing additional classrooms, laboratories and boarding facilities, in this way NSC would be able to take charge of the following tasks in SBCPD programme.

a) Regular conduct of scheduled Lesson Study training/workshops
b) Conduct educational research that will feedback into the training workshops
c) Provide basic teaching materials to schools that promote learning activities of pupils at classroom level

Below are the main activities at NSC and NISTCOL. The activities that these two institutions will be involved in will greatly contribute to Zambia's accelerated attainment of the EFA goals and MDGs. In the long run this School Based approach would help neighbouring countries as the case is at RECSAM and CEMASTEA. The In Service training will be in

NSC	NISTCOL
• Mathematics Education	• Management skills
• Science Education	• Social Sciences
• Technology Education	• Accounting
• Lesson Study	• Institutional management
• Monitoring, evaluation and assessment	• Administrative skills
• Use of Science Kit	• Human Resource management
• Pedagogical skills	• Professional ethics
• Audio-visual skills	• Types of leadership

c) Role of Colleges of Education in SBCPD

The term "College of Education" was introduced in 1999 to change the limited role each college had to include other teacher training functions. The dream has not been fully realised because of a number of challenges. Colleges of Education have not yet fully embraced School In-service Programmes into their activities whether for training purposes or for their own practice. This is one of the key result areas that the ministry has targeted to address under the current Teacher Education transformations.

Zambia Institute of Special Education (ZAMISE) has a challenge of adapting Lesson Study to learners with special needs while NISTCOL has to draw up training programmes for teachers at grades 1-7 and for those at grades 8-12.

The universities need to be brought on board to embrace Lesson study. This can be done through utilising the existing personnel in the training and orientation programmes at the various levels including the school level. In addition, the Lesson Study approach could form part of content for in the training.

d) Roles of Cooperating Partners in Supporting SBCPD

Zambia, as a developing country, has many areas which need both financial and material support.

Cooperating partners may therefore channel their support to the following areas:
1) School level:
Financial support to school based CPD through lesson study.
2) College level:
The support being sort is mainly Technical, Financial and Human resources which should enhance Capacity Development (CD) of Ministry's personnel and strengthen the effort for institutionalization of SBCPD.

Japan International Cooperation Agency (JICA)

JICA has supported a number of projects in the Ministry of Education. One such project is the implementation of the SBCPD through lesson study. The Ministry in Phase III requires technical and financial support in implementing effective conduct of lesson study, continuing support to activities of promoting science and mathematics education such as Junior Engineer, Technician and Scientist (JETS) programme and assistance in upgrading facilities and infrastructure at NISTCOL and NSC

Flemish Association for Development Cooperation and Technical Assistance (VVOB)

VVOB has been supporting the Ministry of Education activities at three levels namely Colleges of Education, Teachers' Resource Centres (TRC) and community schools. The areas of support include capacity development in specific areas of training, materials provision and development, ICT, OD(e)L and, especially, to provide technical assistance for specific technical skills such as ICT. The organisation has been helping to raise the institutional capacity of teacher training colleges through introducing ICT skills and teaching materials as well as supporting CPD activities of college lecturers. VVOB-SPRINT programme has directly assisted teachers at basic and community schools through meetings and workshops in SPRINT framework in order to upgrade the quality

of teaching especially at rural and small schools. This support will continue until 2012, however there will be need to streamline their operation to fit into this master plan.

United States Agency for International Development (USAID)
USAID is supporting the Ministry of Education through capacity building programmes for head teachers and other education managers which focus on leadership and management through Equip 2 programme. NISTCOL is the lead institution in this although all Colleges of Education will be involved in the delivery of the course. This support comes to an end in 2010; therefore NISTCOL will require support to continue with this program to fit in the lesson study approach at managerial level.

Appendix 1:

Ministry of Education
School-based CPD Programme

Lesson Study Implementation Data by Province

As of December (month)/ 2009 (Year)

1. Implementation of Lesson study

Name of district	Central	Copperbelt	Northwestern							Total
GRZ & Grant aided										
No. of high schools	29	62	39							130
No. of high schools implementing LS	29	62	38							129
Percentage of schools implementing LS	100.0%	100.0%	97.4%							99.2%
No. of teachers	1342	3569	778							5689
No. of teachers participating in LS	1315	1760	305							3380
Percentage of teachers participating in LS	98.0%	49.3%	39.2%							59.4%
No. of upper basic schools	301	236	185							722
No. of upper basic school implementing LS	253	223	124							600
Percentage of schools implementing LS	84.1%	94.6%	67.0%							83.1%
No. of teachers	5908	10655	1280							17843
No. of teachers participating in LS	4474	4395	563							9432
Percentage of teachers participating in LS	75.7%	41.2%	44.0%							52.9%
No. of Middle/ lower Basic schools	217	145	261							623
No. of middle /lower basic schools implementing LS	162	2	19							183
Percentage of schools implementing LS	74.7%	1.4%	7.3%							29.4%
No. of teachers	2546	3661	1771							7978
No. of teachers participating in LS	2091	60	14							2165
Percentage of teachers participating in LS	82.1%	1.6%	0.8%							
Total no. of schools	547	443	495							1475
Total no. of schools implementing LS	444	287	181							912
Percentage of schools implementing LS	81.2%	64.8%	37.3%							61.8%
Total no. of teachers	9050	17885	3829							30764
Total no. of teachers implementing LS	6713	6255	882							13850
Percentage of teachers implementing LS	74.2%	35.0%	23.0%							45.0%
Community schools										
No. of schools	495	388	229							1112
No. of schools implementing LS	122	3	0							125
Percentage of schools implementing LS	24.6%	0.8%	0.0%							11.2%
No. of teachers	290	18	204							512
Total no. of teachers implementing LS	251	18	0							269
Percentage of teachers implementing LS	86.6%	100.0%	0.0%							52.5%
Private schools										
Total no. of schools	38	164	12							214
No. of schools implementing LS	6	13	1							20
Percentage of schools implementing LS	15.8%	7.9%	8.3%							9.3%
No. of teachers	129	122	n/a							251
Total no. of teachers implementing LS	75	122	n/a							197
Percentage of teachers implementing LS	58.1%	100.0%	n/a							78.5%
Total										
Total no. of schools	1080	995	726							2801
No. of schools implementing LS	572	303	182							1057
Percentage of schools implementing LS	53.0%	30.5%	25.1%							37.7%
No. of teachers	9469	18025	4033							31527
Total no. of teachers implementing LS	7039	6395	882							14316
Percentage of teachers implementing LS	74.3%	35.5%	21.9%							45.4%

College		
Name of College	Malcom Moffat	Activities
No. of teachers	37	1 Participation to District Stakeholders Workshops
Total no. of teachers implementing LS	26	2
Percentage of teachers implementing LS	70%	3
Name of College	Mkrumah	Activities
No. of teachers	-	1 Sensitisation meeting to lecturers
Total no. of teachers implementing LS	-	2
Percentage of teachers implementing LS	-	3
Name of College	COSETCO	Activities
No. of teachers	44	1.Training in practice of Lesson Study done in September, 2009
Total no. of teachers implementing LS	30	2.One Lecturer Participated Participated as Trainer for Basic School Facilitators at Ndola Tech Sch Aug
Percentage of teachers implementing LS	68%	3
Name of College	Kitwe	Activities
No. of teachers	65	1.Oriented Lecturers in VVOB CPD in September, 2009
Total no. of teachers implementing LS	42	2.Oriented Lecturers in LS during Staff Meeting in Oct 09
Percentage of teachers implementing LS	65%	3
Name of College	Mufulira	Activities
No. of teachers	19	1 Trained Lecturers and Students in use of Problem Solving Techniques in Maths and Science Sept 09
Total no. of teachers implementing LS	15	2 Participated in Monitoring and Evaluation at Dom Convent during mid term Review
Percentage of teachers implementing LS	79%	3 Trained Lecturers in LS in Oct 09
Name of College	Solwezi	Activities
No. of teachers	34	1
Total no. of teachers implementing LS	34	2
Percentage of teachers implementing LS	100%	3

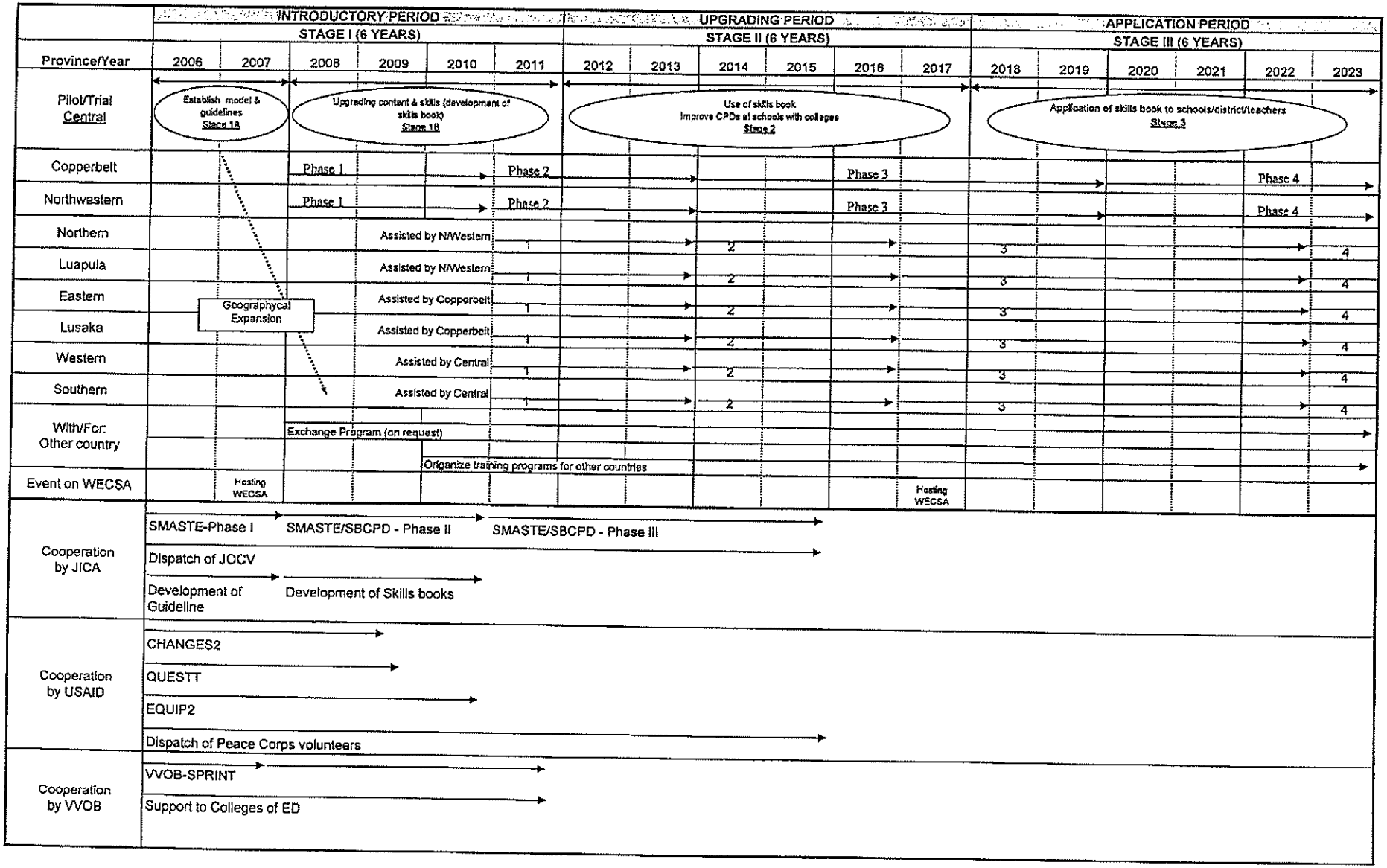
2.Current number of facilitators in the province

Name of the Province	Central	Copperbelt	Northwestern							Total
From College	4	6	3							13
From High school (G10 -12)	32	131	135							298
From Basic School (G8-9)	62	232	5							299
From Basic School (G1 - 7)	93	2	0							95

Appendix 2: Master Table for the Expansion of SBCPD through Lesson Study

Ministry of Education, Teacher Education Department
30/11/09

MASTER PLAN FOR SCHOOL-BASED CPD PROGRAMME IN ZAMBIA
(Through Lesson Study Approach)



Appendix 3:

Expected Contents of the Training for Core personnel

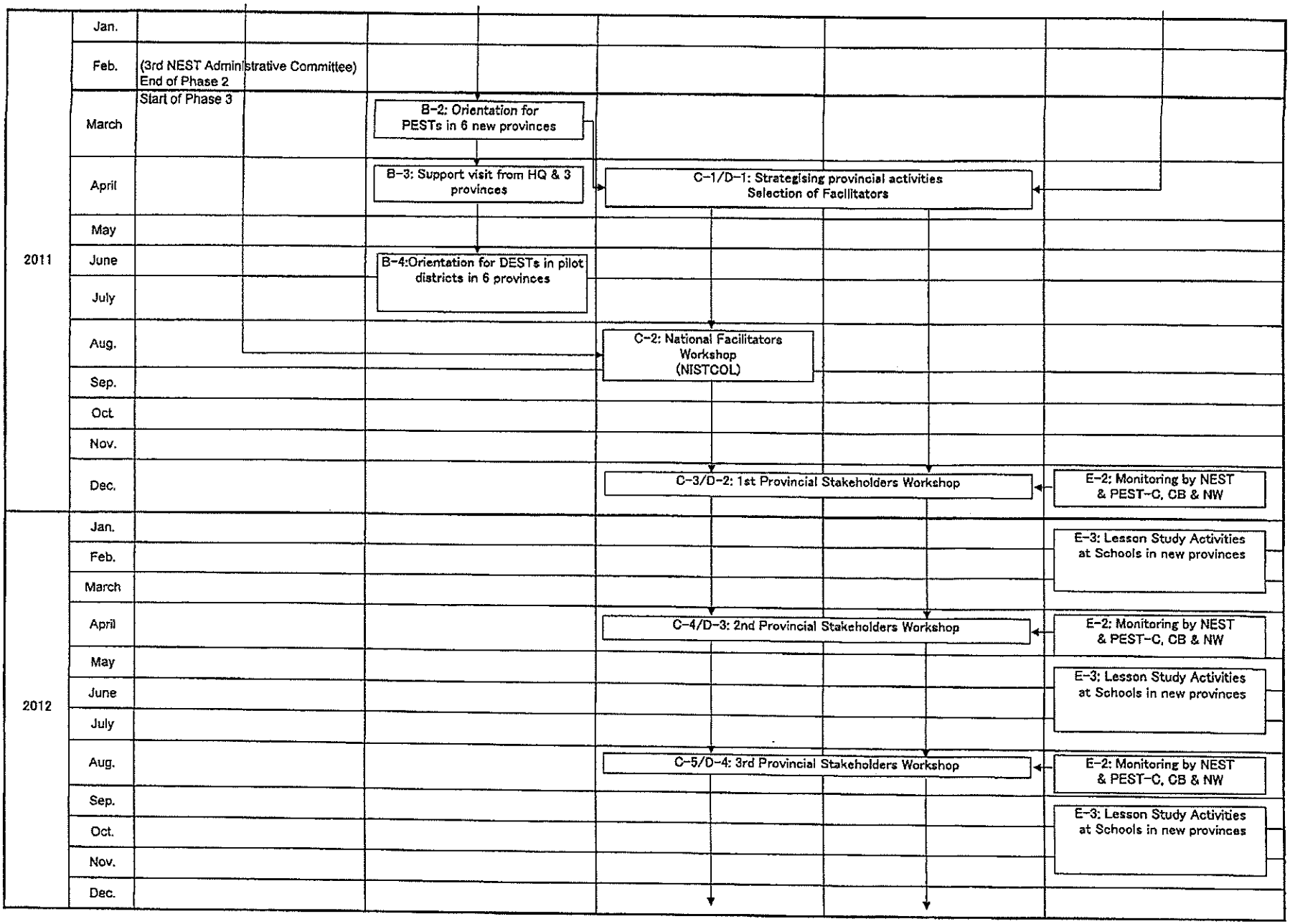
Target Group	Content	Methodology
School Head teachers and deputies	• School management skills • Planning and goal setting • Monitoring and evaluation • Effective communication • Entrepreneurship • Decision making • Strategic Planning • Policy interpretation • Basic accounting • Human Resource management/Development • School improvement • Management of SBCPD	Lecture. Group activity. Practicals. Problem solving
Newly appointed personnel (teachers)	• Professional ethics • Channel of communication • Terms and conditions of service. • Principle accountabilities. • SPRINT frame work • Lesson study principles and process.	Lecture. Group activity. Practicals.
Education Board members	• Entrepreneurship • Decision making • Strategic Planning • Policy interpretation • School improvement	Lecture. Group activity. Practicals.
Facilitators	• Facilitation skills • Communication skills • Content mastery • Pedagogical skills • Lesson critiquing skills	Lecture. Group activity. Practicals.
Standards Officers	• Monitoring and evaluation • Research methods • Curriculum evaluation • Facilitation skills • Lesson critiquing skills • Policy interpretation • Policy formulation • Basic accounting • Human Resource management/Development • HOTS • Lesson Study cycle	Lecture. Group activity. Practicals.
Subject Specialists	• Content mastery • Pedagogical skills • Use of the mobile Labs and science kits. • Monitoring and evaluation • Questioning techniques • The Bloom's taxonomy • Lesson critiquing skills • HOTS • ASEI/PDSI	Lecture. Group activity. Practicals.
College Lecturers	• Lesson Study cycle • Lesson Critiquing • HOTS • ASEI/PDSI • Monitoring and evaluation • Questioning techniques	Lecture. Group activity. Practicals.
PRCCs / DRCCs/EO-TED	• Lesson Study cycle • Lesson Critiquing • HOTS • ASEI/PDSI • Monitoring and evaluation • Questioning techniques • Research methods	Lecture. Group activity. Practicals.

Appendix 4

Roadmap for Implementing Master Plan for School-based CPD Programme through Lesson Study (2010 - 2012)

as of 29/01/2010

Category of Activity		A: Prepration and Authorisation of Documents	B: Orientation of Core Officers	C: Training of Facilitators	D: Orientation of School Managers	E. Monitoring & other activities
2010	Jan.	(8th NEST Technical Sub-committee) A-1:Completion of Final Draft of Master Plan ↓ A-2:Discuss at 2nd NEST Administrative Committee				
	Feb.	A-3: Finalisation of Master PLan ↓ A-4: Processing for Authorisation ↓ A-5: Print & Distribution to related organisations				
	March	(9th NEST Tech, Sub-Committee)				
	April	A-6: Revising Implementation Guidelines (4th edition)				
	May	A-7: Print & Distribution of revised Implementation Guidelines (4th edition)	(Conduct Endline Survey for Phase 2)			
	June	(10th NEST Tech, Sub-Committee)	(Conduct Endline Survey for Phase 2)			
	July		(Conduct Endline Survey for Phase 2)			
	Aug.		B-1: Orientation for Stakeholders at HQ & NISTCOL			E-1: Orientation for Universities & Colleges
	Sep.	(11th NEST Tech, Sub-Committee) (Final Evaluation of Phase 2)				
	Oct.	A-8: Revising Teaching & Management Skills Books (2nd edition)	B-2: Conduct Rapid Appraisal for Phase 3 in 6 new provinces			
	Nov.	A-9: Print and Distribution of revised Skills Books (2nd edition)				
	Dec.					


2011
Jan.
Feb.
(3rd NEST Administrative Committee)
End of Phase 2
March
Start of Phase 3
April
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
B-2: Orientation for PESTs in 6 new provinces
B-3: Support visit from HQ & 3 provinces
B-4:Orientation for DESTs in pilot districts in 6 provinces
C-1/D-1: Strategising provincial activities
Selection of Facilitators
C-2: National Facilitators Workshop (NISTCOL)
C-3/D-2: 1st Provincial Stakeholders Workshop
E-2: Monitoring by NEST & PEST-C, CB & NW
2012
Jan.
Feb.
March
April
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
E-3: Lesson Study Activities at Schools in new provinces
C-4/D-3: 2nd Provincial Stakeholders Workshop
E-2: Monitoring by NEST & PEST-C, CB & NW
E-3: Lesson Study Activities at Schools in new provinces
C-5/D-4: 3rd Provincial Stakeholders Workshop
E-2: Monitoring by NEST & PEST-C, CB & NW
E-3: Lesson Study Activities at Schools in new provinces

ザンビア　SMASTE　授業研究支援　プロジェクトフェーズII

（教育評価）短期専門家

業務完了報告書

平成22年　11月

１．専門家氏名：伊藤治夫
２．プロジェクト名：ザンビア　SMASTE　授業研究支援　プロジェクトフェーズII
３．指導分野：教育評価
４．派遣期間：平成22年8月29日～平成22年10月23日
５．本邦所属先：ICONS国際協力株式会社

6．専門家活動内容と成果達成状況

(1) 活動内容

SMASTE 授業研究支援プロジェクトを通じて実施してきた授業研究活動の学校現場における効果を確認することを計画し、中央州におけるインパクト調査の実施及び他州での将来的なインパクト調査実施に向けた準備作業を実施した。具体的には下記の内容を行った。

・中央州における国家試験データの分析

・授業研究活動のインパクト調査分析および調査分析にかかわるカウンターパートへの技術移転

(2) 達成状況

中央州におけるインパクト調査の実施に関しては、高等学校の理科において、プロジェクトの効果の把握、授業研究活動の促進・阻害要因の分析をするといった目的は達成した。この調査結果を教育省関係者間に共有したことにより、今後、ザンビア政府の政策である「学校ベースの教員の継続的職能開発」(School-Based CPD) への調査結果の反映が期待される。インパクト調査・分析にかかわるカウンターパートへの技術移転については、調査全般にわたり、カウンターパートの高い主体性がみられたものの、調査・分析技術の定着には、専門家との協働によるさらなる技術指導が必要であることからも達成度は十分とは言えない。

(3) 成果品

① 業務実施計画書

② 現地業務結果報告書

③ 和文現地業務報告書（別添 1）

④ ECZ データの加工マニュアル（別添 2）

(4) 計画と進捗に齟齬があった場合、その理由

インパクト調査の対象範囲について、プロジェクトのフェーズ 2 から対象となった他教科、基礎教育学校における調査・分析の実施は困難であった。理由としては、特に基礎教育学校からの国家試験合格率等のデータの入手が困難であったこと、調査期間が限定されていたことが挙げられる。

また、授業研究による教員、生徒の態度変容へのインパクトの測定に関しては、当初、プロジェクト内のベースライン、エンドラインデータの使用を想定していたが、ベースラインとエンドラインデータの一貫性が低いことから、事前、事後の態度変容を分析項目として用いることが困難であった。

(5) プロジェクト事業進捗に果たした専門家業務の役割

相手側プロジェクト関係者、日本人専門家の継続的な努力により達成した授業研究活動成果を、国家試験を用いて視覚化することにより、プロジェクト関係者への活動に対するモチベーションの向上が図られることが期待される。また、学校レベルでの授業研究活動の促進、阻害要因の分析を行うことで、学校レベルでの授業研究の課題が明確になることにより、今後のプロジェクト効果の全国展開の計画策定を効果的に行うことに寄与する。同時にカウンターパートに対するインパクト調査の技術移転の結果、現在プロジェクトで実施しているモニタリング・評価の実施の精度、報告書の分析の向上が期待される。

7．指導分野および関連分野にかかる受入国、協力先の現状と問題点

指導分野である教育評価での現状として、プロジェクトの効果をモニタリングする制度はすでに構築されている。一方でモニタリング結果の分析が授業研究活動の質の向上に活用されないといった問題が指摘されている。

8．専門家指導分野およびその関連分野で、今後プロジェクト目標を達成するために残された課題

本短期専門家派遣と同時期(2010 年 10 月)に実施されたプロジェクト終了時評価調査において、プロジェクト目標である「対象州において学校ベースの授業研究活動を通じて、教室レベルの授業・学習活動が向上する。」の達成見込みは確認された。一方で授業研究活動の実践度は、学校によって異なる。教育評価の視点から、さらなる授業研究活動の定着に向けた取り組みとしては、校内モニタリングの強化及び PEST、DEST を中心とした外部モニタリングの強化が求められる。特に外部によるモニタリングの重要性が確認された一方で、予算不足よりモニタリングの実施が限定的であることが課題となっている。この課題に対しては、インパクト調査結果等から、優先課題、対象校を絞り込み、費用対効果の高いモニタリングの実施を提言した。

9．専門家指導分野およびその関連分野で、今後受入国が取り込む必要があると考えられる課題

相手側機関が中心となったインパクト調査の実施には、適切なデータ処理能力、データの解釈に関して、高い技術が求められている。特に国家教育統計を必要な形式に処理する必要があることからも、その扱いには精度が求められる。インパクト調査のみならず、モニタリング結果の活用に関しても、関係者の情報処理技術、結果の分析にかかわる関係者の能力向上が必要となる。この分野におけるカウンターパート機関の人材育成の際には、ザンビア国家試験委員会（ECZ）等の情報処理部門の巻き込みを図ることにより、本省レベルでの統計分析能力の向上を図る必要がある。

10．　類似プロジェクト、類似分野への今後の協力実施にあたっての教訓、提言等

JICA 理数科プロジェクトにおいて、生徒の成績向上を測定することを目的としたインパクト調

査を実施することの意義は高い。ザンビア国の国家教育統計には、国家試験合格率、残留率、修了率を教育の質の指標としている。プロジェクトは教育の質の改善を目指していることからも、国家政策目標と整合した、プロジェクト効果を示すことで、プロジェクト経費を双方で分担している同プロジェクトにおいては、カウンターパート機関がプロジェクト継続のための説明責任を果たすことが可能となり、プロジェクトの自立発展性の向上が期待される。

アフリカにおける JICA 理数科プロジェクトの多くが、教員、生徒の意識変化、態度変容といった中間成果物をプロジェクト目標の指標としているが、その結果生じる最終成果である生徒の能力向上を成果として示し、関係者に共有することにより、プロジェクトの自立発展性が確保される。そのためには、教育統計の入手が困難であるアフリカ諸国において、インパクト調査を戦略的にプロジェクト形成段階に組み込むと同時に、カウンターパートが主体的に実施できる範囲での統計分析等を用いた質の高いエビデンスを収集するための調査計画の策定が必要となる。

別添1：和文現地業務報告書

1．背景

SMASTE 授業研究支援プロジェクトは 2005 年 10 月より 2007 年 10 月の 2 年間、中央州をパイロット州とし、8 から 12 学年担当の理科教員を対象として実施された。授業研究のさらなる普及展開を目指し、2008 年 2 月から 3 年間の計画でプロジェクトフェーズ 2 を開始し、中央州における 1-7 学年、理科以外での教科、コッパーベルト州、北西部州における 8-12 学年の理科での授業研究導入を支援している。プロジェクトはザンビア政府の政策である「学校ベースの教員の継続的職能開発」（School-Based CPD:SBCPD）の具体活動として授業研究を導入し、授業研究活動を通じた教員の授業実践力および指導力の向上を目的としている。ザンビア教育省は 2000 年から現職教員研修プログラム(School Program of In-Service for the Term: SPRINT)を実施しており、同 SBCPD は SPRINT のフレームワームの中で実施されている。

2．インパクト調査の目的

プロジェクト実施機関であるザンビア国教育省が、プロジェクトフェーズ 1 及びフェーズ 2 を通じて実施してきた授業研究活動の学校現場における効果を確認することを計画し、中央州におけるインパクト調査の実施及び他州での将来的なインパクト調査実施に向けた準備に対する技術的な支援を我が国に要請した。具体的には、中央州における国家試験データの分析および授業研究活動のインパクト調査分析、分析にかかわるカウンターパートへの技術移転を実施した。

3．調査期間

平成 22 年 8 月 29 日～平成 22 年 10 月 23 日

4．調査方法

本調査は定量的、定性的調査手法を用いて SMASTE における授業研究活動のインパクトを測定した。まず定量的手法では、ザンビア国家試験委員会（Examination Council of Zambia: ECZ）からの試験合格率の経年データを一般指標モデルにより、中央州とプロジェクト未実施州[1]との比較を行うことでプロジェクト効果を分析した。また、国家試験合格率を被説明変数として、学校訪問ならびに質問票により測定した授業研究度定着度および他の因子を説明変数とした相関分析、重回帰分析を行った。

一方、プロジェクト関係者に対するインタビューの結果を定性的データとして、定量的調査結果を補完する形で用いた。

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[1] コッパーベルト州、北西部州はフェーズ 2 対象のため除外している。

5．データ収集

(1) 国家試験合格率の分析に用いたデータ

ECZ からの全国の国家試験合格率（12 学年）のデータをメモ帳形式で入手し、EXCEL フォーマットに変換後、理科および数学の合格率を高等学校毎に抽出した。国家試験合格率のプロジェクト未実施州と中央州の比較に用いたデータ数[2]は表 1 に示す通り。また、分析に用いた合格率には、各高等学校の合格率以外に、それらの学校で実施されている補習クラス（Academic Production Unit: APU）および一般教育証明（General Certificate Education：GCE）の試験結果[3]も含まれている。

表 1: 国家試験合格率集計データ数

	2005	2006	2007	2008	2009
ﾌﾟﾛｼﾞｪｸﾄ未実施州	432	434	448	480	481
中央州	57	59	60	76	81

(2) 相関・重回帰分析に用いた収集データ

- 分析単位：すべてのデータは学校平均に変換
- 被説明変数：2009 年の中央州の各高等学校の理科における国家試験合格率[4]
- 説明変数：①学校の属性情報、②授業研究定着度、③学校関係者への質問票の結果

① 学校の属性情報

説明変数および授業研究実施に影響を与えると推定された高等学校の属性として、教会系、寄宿舎、APU クラスの有無を中央州教育事務所において確認した。

② 授業研究定着度

中央州の高等学校の理科においては、1 学期当たり 2 回から 3 回の授業研究活動が定着している。しかし、授業研究活動の成果である教員による日常的な指導案の作成および校長、教科主任等による定期的な授業観察の実施といった授業研究の定着度には、学校間で格差がある。したがって、授業研究活動の定着度を学校訪問により確認し、表 2 を基準として、学校毎にレーティングを行うことによりプロジェクトの効果を示す説明変数とした。

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[2] 各高等学校、APU、GCE の試験センターの合計を示している。

[3] APU、GCE における授業も、プロジェクトにおける授業研究により教授技術を向上させた教員が担当しており、プロジェクト効果の影響を受けていることから集計に含めた。

[4] 本来、プロジェクト効果の測定には、プロジェクト実施以前の 2005 年から現在の 2009 年の合格率の伸び率を被説明変数として用いる必要があるが、2005 年から実施された新教育制度による学校のアップグレード等により、2005 年の 12 学年の試験結果がない学校があり、また、合格率が常に高い学校では、伸び率の変化が少ない等、プロジェクト効果を測定する上で他の要因が強いことから、直近の試験結果である 2009 年の合格率を被説明変数として用いている。

表 2：授業研究実施レーティング

	授業観察ツール	指導案	授業研究実施計画
0	授業観察ツールがない	指導案がない	授業研究実施計画がない
1	過去の学期のツールがある	過去の学期の指導案がある	過去の実施計画がある
2	現在の学期のツールがある	数名の教員の現在の学期の指導案がある	現在の学期の実施計画がある
3	授業研究サイクル以外にも授業観察ツールが活用されている	全教員が指導案を作成している	授業研究のﾃﾞﾓ実施者を含む詳細計画が作成されている
4	校長、副校長により授業観察ツールが定期的に活用されている	教科主任、副校長により指導案がチェックされている	授業研究の実施実績が計画に基づき記録されている

③ 学校関係者への質問票

中央州における高等学校 33 校の内、私立高校（3 校）および 12 学年の試験がまだ実施されていない新設校（1 校）を除く 29 校を対象として、校長、ファシリテータ、理科教員、生徒（12 学年）に対して質問票を配布した。

表 3: 質問票収集数

対象	質問票
校長	29
ファシリテータ	23
理科教員	136[5]
生徒（12 学年）	280[6]

(3) インタビュー調査[7]

インタビュー調査は 2009 年の国家試験結果の上位、下位、各 5 校の校長、ファシリテータ、理科教員を対象として実施し、インタビューを IC レコーダーにより録音し、文章化し分類することにより、各変数の定量的分析結果に併記した。

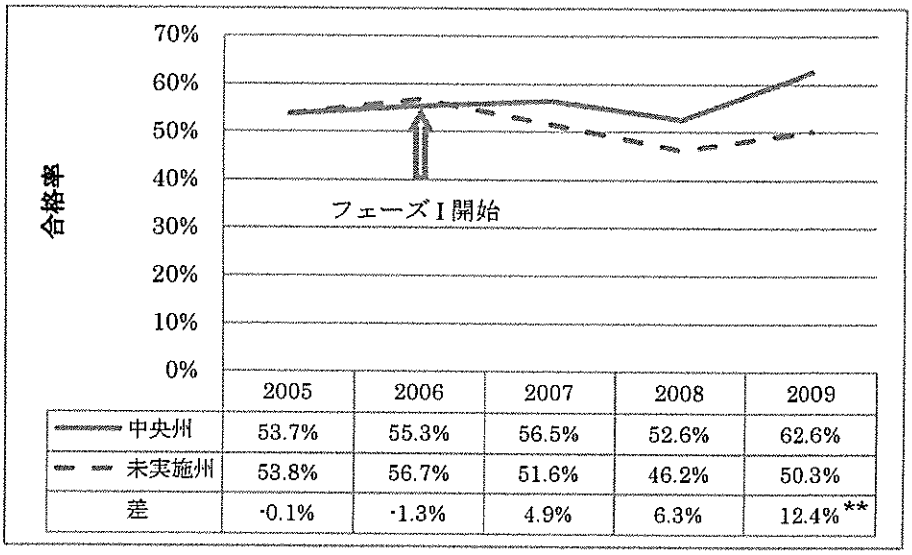
6．調査結果

(1) 理科におけるプロジェクト未実施州と中央州の比較

プロジェクト未実施州と中央州の合格率の比較の結果、プロジェクト開始の 2006 年以降、授業研究の実施率が 100%[8]の中央州における理科[9]・生物では、図 1、2 に示すように試験合格率に正のイン

[5] 質問票の結果、対象校における全理科教員数は 209 名となっている。
[6] 2009 年国家教育統計によると、中央州における 12 学年の全生徒数は 7,817 名となっている。
[7] インタビュー調査結果については、現地業務結果報告書（英文）を参照。
[8] プロジェクトモニタリング結果より。
[9] 理科の試験は物理、化学の教科内容（各 50%）から構成されている。

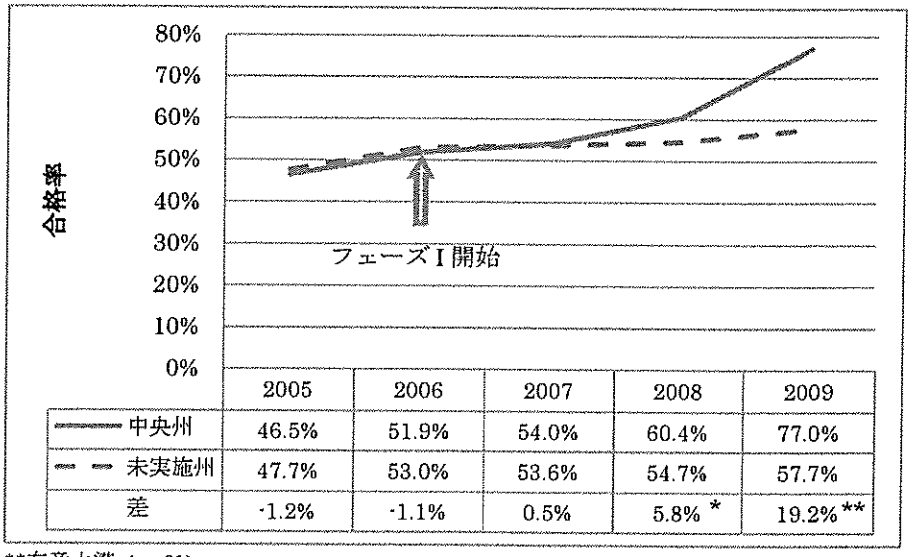
パクトが確認された。また、各年の合格率の差をt検定（Independent t-test）により確認した結果、理科（2009年）、生物（2008、2009年）の中央州とプロジェクト未実施州の試験合格率の差には統計的有意差が確認された。



	2005	2006	2007	2008	2009
中央州	53.7%	55.3%	56.5%	52.6%	62.6%
未実施州	53.8%	56.7%	51.6%	46.2%	50.3%
差	-0.1%	-1.3%	4.9%	6.3%	12.4%**

**有意水準 (p<.01)

図1：理科合格率比較



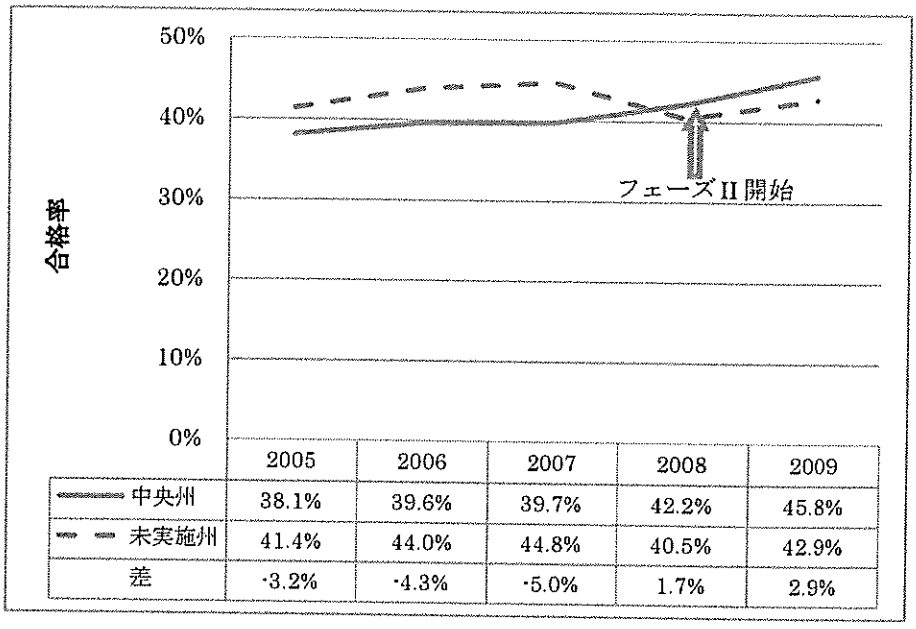
	2005	2006	2007	2008	2009
中央州	46.5%	51.9%	54.0%	60.4%	77.0%
未実施州	47.7%	53.0%	53.6%	54.7%	57.7%
差	-1.2%	-1.1%	0.5%	5.8% *	19.2%**

**有意水準 (p<.01)
*有意水準 (p<.05)

図2：生物合格率比較

(2) 数学におけるプロジェクト未実施州と中央州の比較

中央州においてフェーズ2（2008年）より対象となった数学に関しても、理科との比較対象として分析した。その結果、数学においては、プロジェクト開始直後の2008年から中央州ではプロジェクト未実施州との比較において、合格率の向上がみられるものの、現時点では顕著な差は確認されない。（図3参照）



	2005	2006	2007	2008	2009
中央州	38.1%	39.6%	39.7%	42.2%	45.8%
未実施州	41.4%	44.0%	44.8%	40.5%	42.9%
差	-3.2%	-4.3%	-5.0%	1.7%	2.9%

図3：数学合格率比較

(3) レベル別国家試験合格率

以下の図は中央州の理科、生物のレベル別合格率[10]を示しているが、大学進学などの条件となるレベル6以上の合格者がプロジェクト未実施地域に比べ多い。中央州の合格者のレベルが単なる合格レベル（レベル7、8）でないことは、生徒が理科・生物にかかわる高い水準の理解度を身につけていることを示している。

10 レベル1が最も高くレベル1からレベル6までがPass rate with qualityと呼ばれ大学進学等の条件となっている。

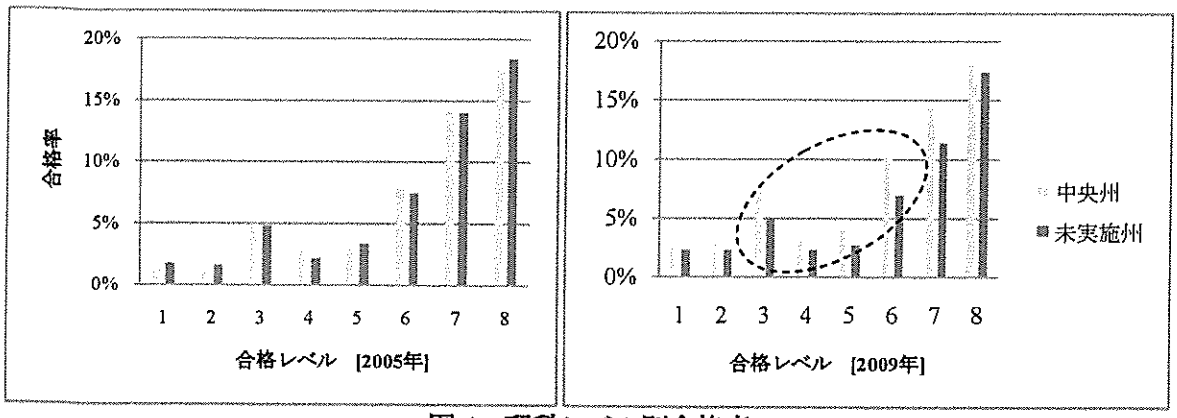


図 4：理科レベル別合格率

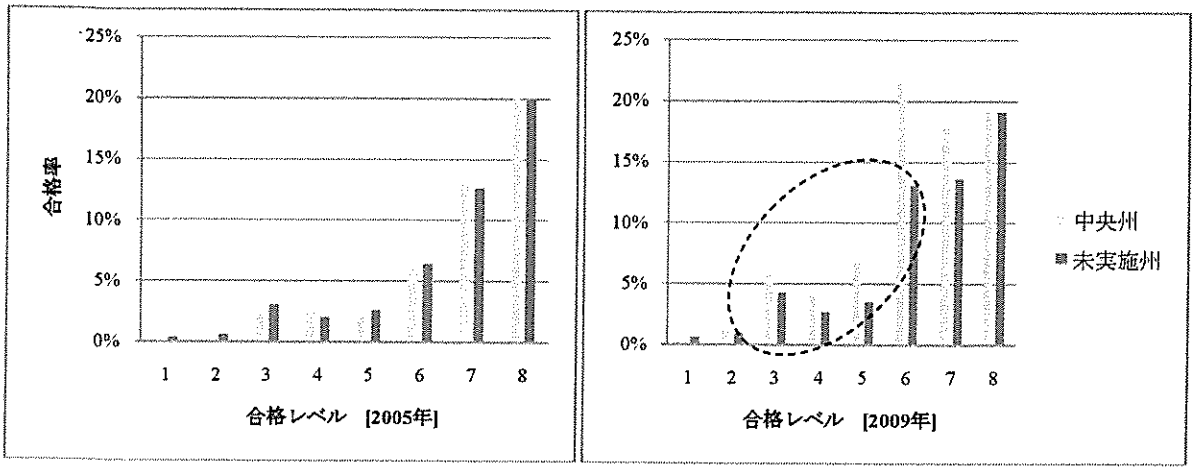
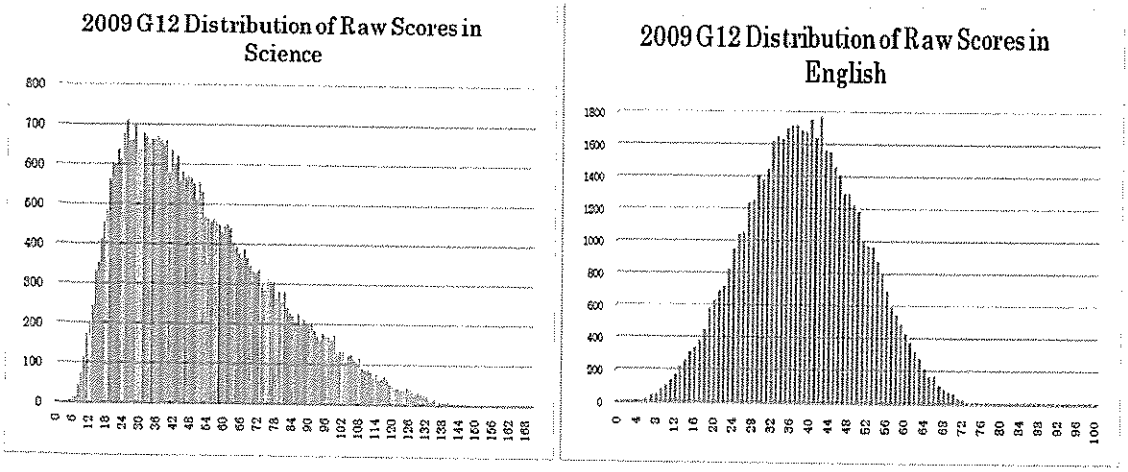


図 5：生物レベル別合格率

(4) 理数科分野の国家試験合格率におけるインパクトの要因

理科分野における国家試験合格者の素点は図 6 に示す通り、英語などの教科に比べ非常に低く、下位 20%のスコアに 30%以上の受験者が位置している。このことからも、特に理数科分野においては、若干の合格率の伸びであっても、プロジェクト未実施地域との差が顕著に現れる傾向にあり、授業研究活動による教員の教授技術、生徒の理数科に対する関心の向上が確認されていることからも、授業研究活動が国家試験の結果に部分的にインパクトを与えたことが想定される。



出所：Examination Council of Zambia :ECZ

図 6：理科、英語の試験結果（12 学年）

(5) 国家試験合格率と授業研究定着度の関連性

授業研究活動の定着状況と各学校における教育の質を示す国家試験合格率には、統計的にも有意な相関関係が確認された($r = .70$　$p < .01$) [11]。理科の国家試験合格率が高い高等学校ほど、授業研究活動の実施が活発であるという相関関係があることが分かる（図 7）。教会系高等学校は一般的に授業研究活動が定着しており、同時に高い試験合格率を有している。

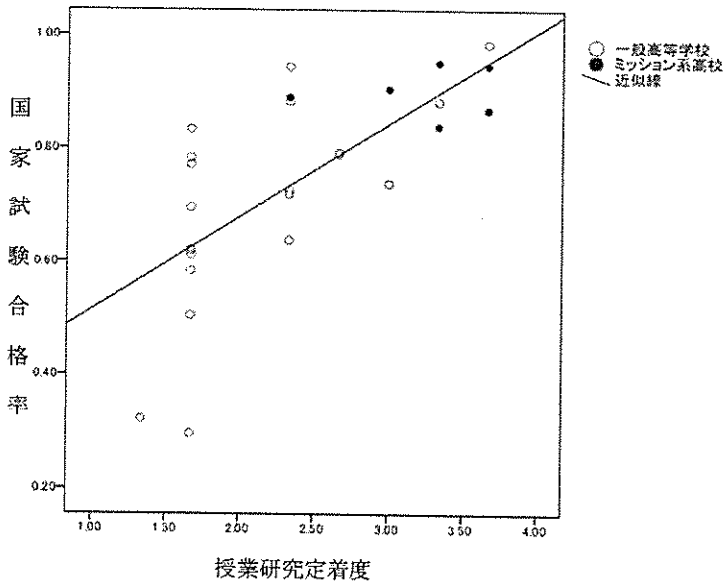


図 7：授業研究定着度と国家試験合格率の相関関図

11 相関係数の判断基準としては、[±.1：弱い相関、±.3：中程度の相関、±.5：強い相関]を用いた。参照文献：Field, A. P. (2009). *Discovering statistics using SPSS*. London: Sage.

(6) 授業研究定着度の国家試験合格率への影響

図 8 の右側の数値は国家試験合格率を被説明変数、授業研究定着度および他の要因を説明変数[12]として他の説明変数の影響を除外した関係の強さを示す標準化偏回帰係数 β を示している。重回帰分析[13]の結果、授業研究定着度と国家試験合格率は $\beta = .71$　$p < .01$ であり、他の要因を考慮しても授業研究の定着が国家試験合格率に強い影響を与えていることが確認できる。

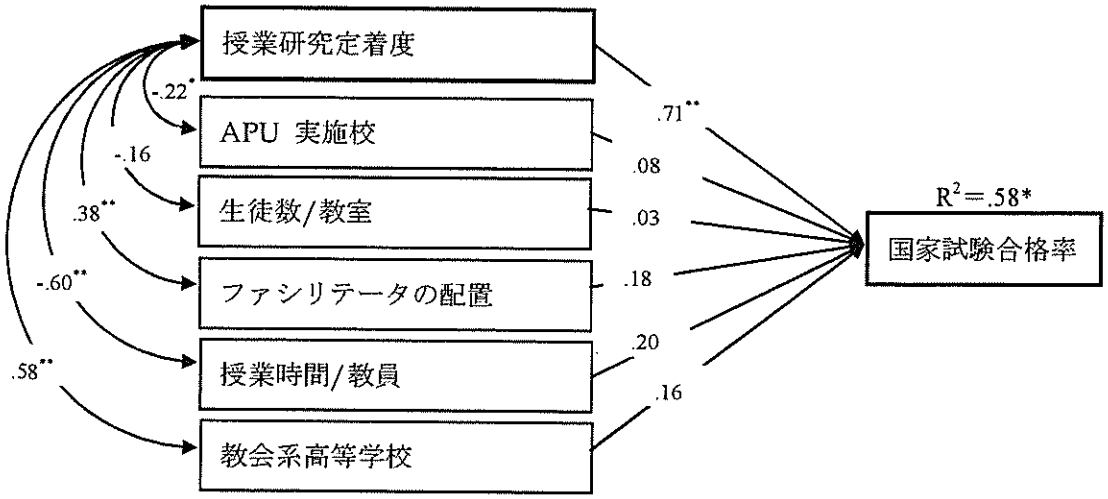


図 8：国家試験合格率を被説明変数とする重回帰分析結果

(7) 授業研究活動定着の促進・阻害要因

図 8 の左側の数値は授業研究定着度と各要因との間の相関係数を示している。数値は各説明変数間の相関の強さを示し、マイナスの相関係数は、その要因が授業研究の定着度に負の影響を与えていることを示している。

1) APU 実施校

大部分の公立高等学校では Academic Production Unit: APU と呼ばれる補習クラスを午後から実施している。APU は国家試験合格者であるが、学校の収容能力から午前中の授業に参加できない生徒が、試験結果を基に 2 部制の午後クラスに割り振られ、授業を受けている。午前のクラスの教員が午後の APU での授業も担当しており、教員の負荷が増えることで教育の質の低下が指摘されている。APU の教室は生徒数が 80 名を超えるケースもあり、グループワークや実験を取り入れた授業の実施が困難となっている。同時に授業研究活動の実施にも、教員が十分な時間を確保できないことを要因として、APU 実施校と授業研究の定着度には負の相関関係（$r = -.22$　$p < .05$）がある。

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12 決定係数である R^2 は.58 でありこれらの説明変数により、試験合格率の 58%を説明している。

13 中央州による英文報告書は、カウンターパートの理解度に配慮し、各変数間の相関分析にとどめ、重回帰分析は使用していない。

2）クラス当たり生徒数

聞き取り調査では、クラス当たりの生徒数の増大が教育の質の低下に影響を与えることが指摘された。調査対象校の1クラス当たりの生徒数の平均は45.1名となっているが、一般高等学校（47.3名/クラス）と教会系高等学校（36.8名/クラス）には格差がある。また、弱い相関($r = -.16$　$p > 0.5$)ではあるが、1クラス当たりの生徒数が増えるほど授業研究活動の定着度、特に教員による指導案の準備状況が低下する傾向が確認された。

3）ファシリテータの配置

ケニア、マレーシア、日本で研修を受講したファシリテータが配属されている高等学校では、授業研究の定着度が高いといった相関がみられる（$r = .38$　$p < .01$）。対象29校中、18校に本邦研修、第三国研修を受講したファシリテータが配属されており、多くの場合、理科の教科主任として他の教員の指導案の確認、授業観察による指導を実施している。この結果は、プロジェクトによるファシリテータの育成が、授業活動の実施に正の影響を与えていることを示している。

4）教員当たりの授業時間

教員の週当たり授業時間の平均値と授業研究実施度との間には、強いマイナスの相関関係が確認された（$r = -.60$　$p < .01$）。一般的に理数科教員の充足率は他の教科に比べ低く、1教員当たりの授業時間も他教科に比べ多い。シラバスをこなすことが優先され、授業研究活動に充てる時間の確保が困難であることが多くの理科教員から指摘された。高等学校における特に理数科教員の人数の不足を補うことは教育省内でも優先課題となっている。

5）教会系高等学校

教会系の高等学校であることは授業研究の定着に正の影響を与えている（$r = .58$　$p < .01$）。教会系の高等学校の12学年の試験合格率が高い理由として、保守的な学校運営により、旧セカンダリースクールの体制を維持しており、中高一貫校として8年から受け入れを行い、その後9学年の国家試験の結果を基に選抜が行われ、成績の良い生徒のみが10学年に進級し、12学年の試験を受けていることが挙げられる。また、カブウェ以外の地域では学校に寄宿舎が併設されており、生徒の高い出席率を確保している。さらには、教会系の高校はGrant-aided schoolとも呼ばれ、教会からの寄付金により学校経営を行っていることから、他の公立高校と比較しても充実した学校インフラを有していると同時に、教会が学校の人事権等を有しており、コミットメント、能力の高い教員が定着していることが指摘された。

6）活動経費

本調査においては、各学校での授業研究活動にかかわる予算状況の把握が困難であったため、分析対象としていないが、学校運営委員会（High School Board）[14]からの授業研究活動へ十分な予算配分（ワークショップへの交通費、ミーティング時の飲み物、その他文具）が活動の実施、ワークショップの参加に影響を与えることが指摘された。

(8) 授業研究定着度と生徒中心学習との相関

図 9 は授業研究実施度と生徒中心学習[15]の相関を示している。これらの変数間には、統計的有意な正の相関が確認された（$r = .33$　$p < .05$）。このことは、授業研究が定着している学校においては、教室でグループワーク、実験を中心とした生徒中心学習が実施されていると感じる生徒が多いことを示している。12 学年の理科の国家試験には実技が含まれることからも、授業研究による生徒中心学習の促進が合格率の向上に正の影響を与えていることが想定される。一方で本インパクト調査においては、国家試験合格率と生徒中心学習との強い相関は確認されなかった。生徒中心学習が生徒の学習能力向上に与える影響に関しては別途詳細な調査・分析が必要である。

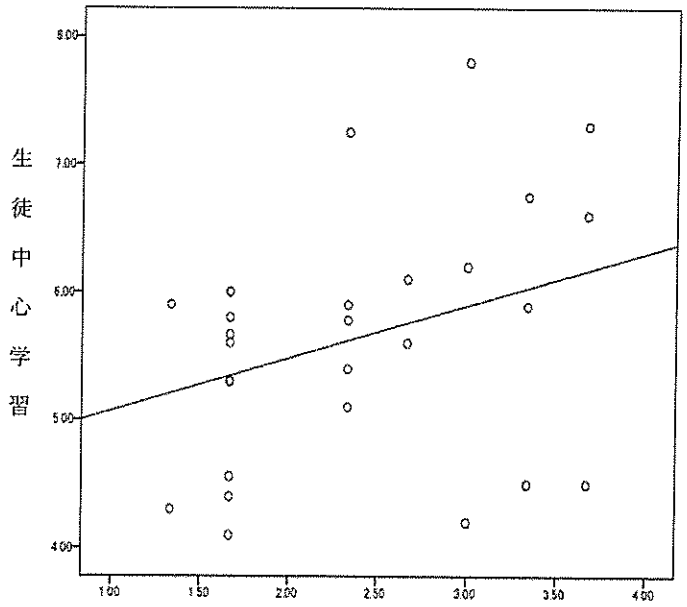


図 9：授業研究定着度と生徒中心学習の相関

[14] 高等学校は学校運営委員会により自主的な運営が任されており、政府予算とともに年間 500,000～700,000 ｸﾜﾁｬ（約 1～1.4 万円）程度の授業料収入により運営が行われている。授業料の設定は各学校の運営委員会に任されており、学校毎に異なる。授業研究活動の年次計画が年初に教科主任により作成され、校長を委員長とし、教員、生徒代表、労働組合代表からなる学校運営委員会に対して予算申請を行う。

15 生徒中心学習の実施度は生徒への質問票により確認した。

7．提言

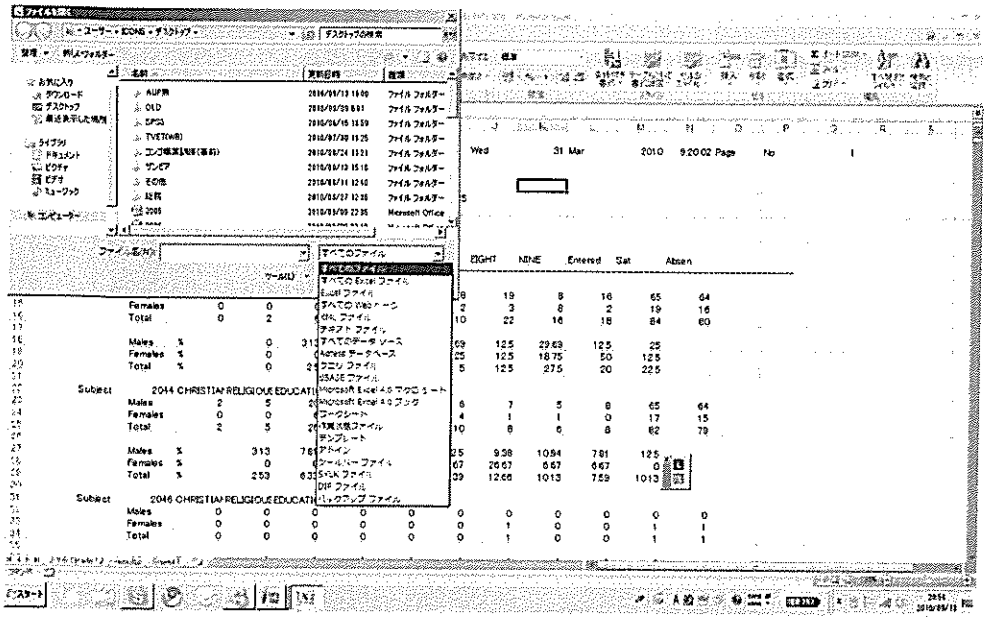
- 全部の高等学校において授業研究活動が実施されている中央州では、プロジェクトが行われていない州との比較からも、理科の国家試験合格率が高い傾向にあることが確認された。また、授業研究の定着度と試験合格率の重回帰分析の結果からも、授業研究が生徒の成績向上に寄与していることがわかる。一方でフェーズ2から対象になった他教科、基礎教育学校における成果は、今回の調査対象としていない。今後、授業研究の全国展開が計画されていることからも、別途これらの分析を行うことは有用である。
- 授業研究の定着度は校長を中心とした内部モニタリング体制に影響を受けている。しかし、内部のモニタリング体制が構築されていない学校では、PEST、DEST、ZEST による外部モニタリング・指導の実施が授業研究実施の継続性を確保するために不可欠であり、モニタリング実施能力のさらなる向上が求められる。
- 授業研究の主な阻害要因は授業時間の増大、APU クラスの実施等による時間の不足である。指導者による学校での効率的な授業研究活動の実施、教員の授業研究活動への理解の促進が求められる。
- 授業研究の定着には、国内外の研修を受講したファシリテータの各学校への配置、ファシリテータワークショップ等による継続的な研修機会の提供が必要となる。

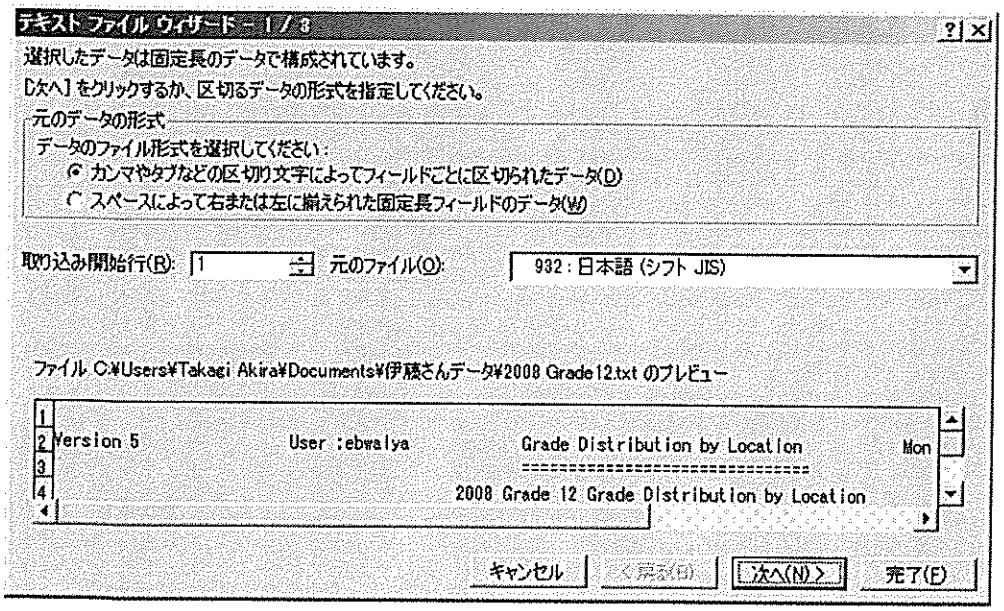
ベースライン、エンドライン調査の結果の有効利用のために、同一校での事前、事後調査の実施により一貫性を確保する必要がある。また、学校の属性、学習環境、教員プロファイル等を含む情報を質問票で確認することにより、プロジェクトの促進・阻害要因分析が容易となる。

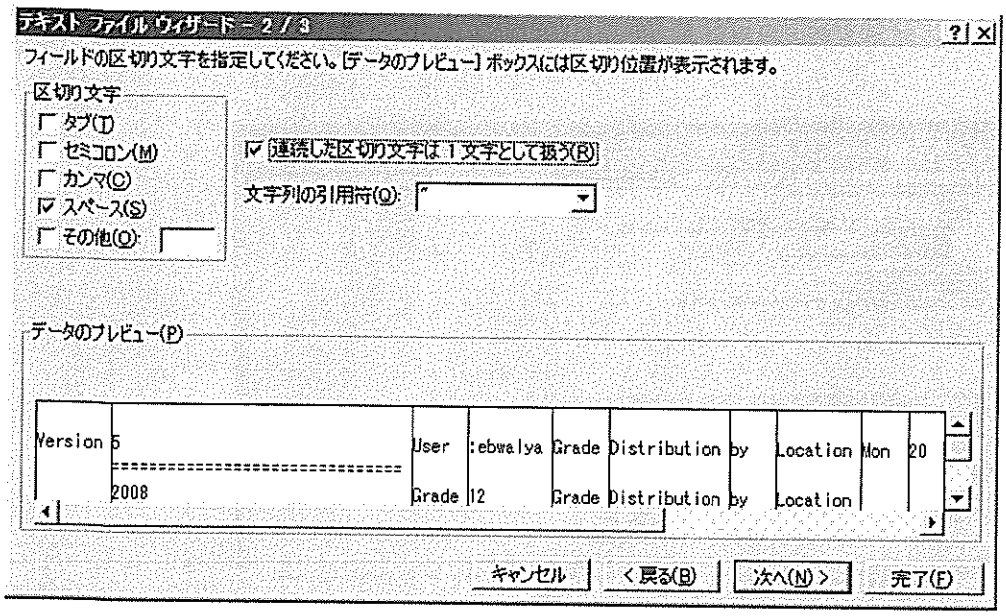
別添2：ECZデータの加工マニュアル

ECZ からの国家試験合格率データはメモ帳の形式で保存されていることから、EXCEL に変換する必要がある。また、インパクト調査で用いた 2005 年から 2009 年の EXCEL ファイルには理数科の合格率を自動計算、抽出するためのプログラム（マクロ）が組まれており、同ファイルを活用することにより、今後のデータ集計が容易になる。下記に EXCEL への変換、集計方法を示す。

1．　EXCEL 画面からメモ帳で保存された ECZ からのデータを開く。（すべてのファイルを選択）

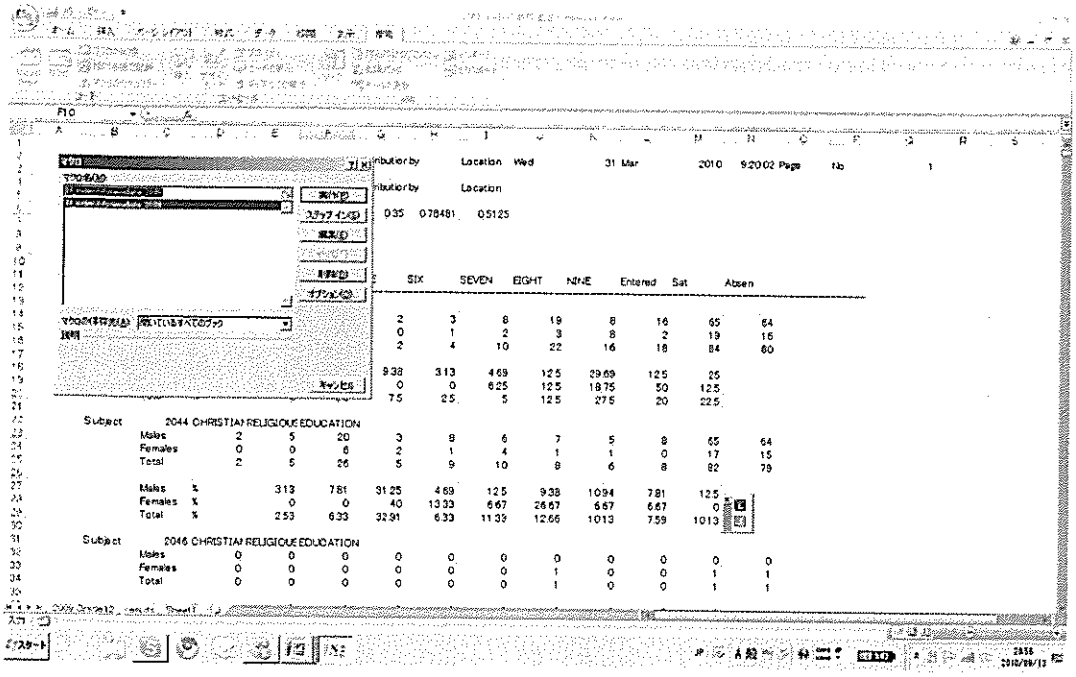




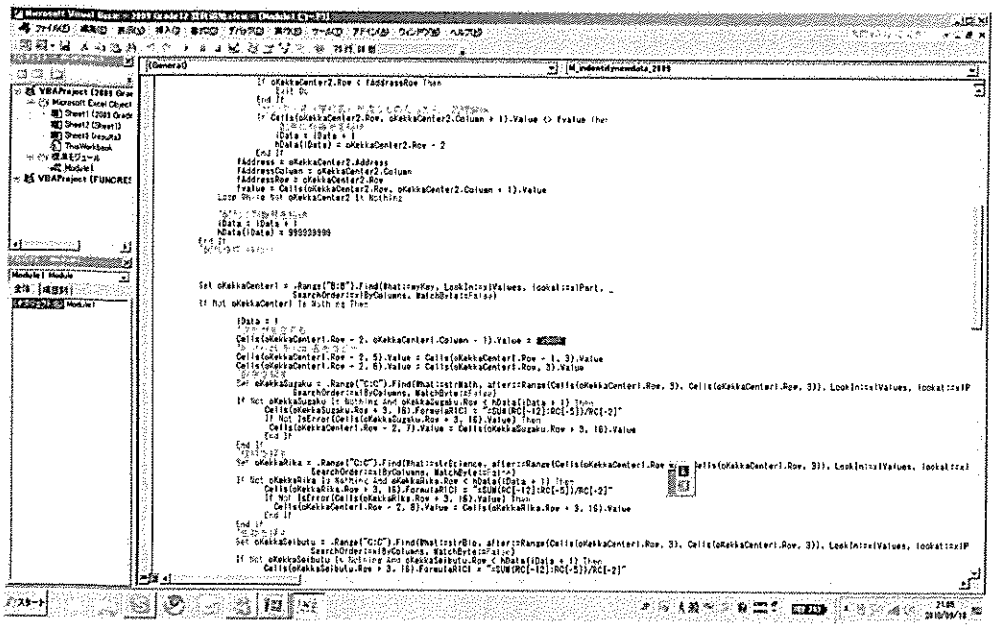


2．開いたファイルを 2009 年のデータに貼り付け、左端（A 列）に 1 行セルを追加挿入する。

3．「開発」→「マクロ」→「編集」でマクロを編集する。



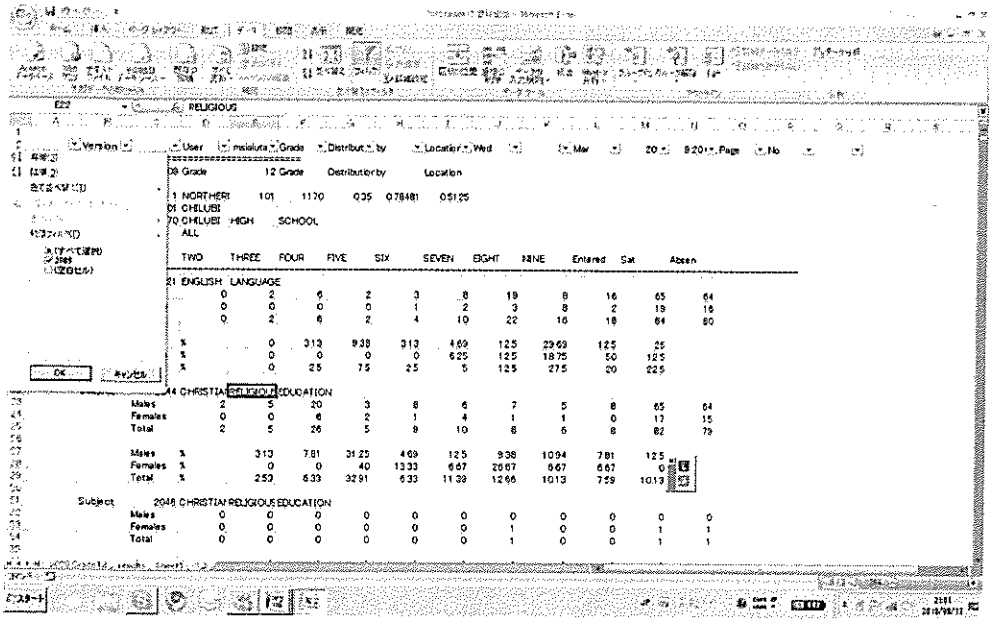
4．編集点は 1 か所。「フラグを立てる」の 1 行目”2009”を張り付けるデータの年（例“2010”）に修正。



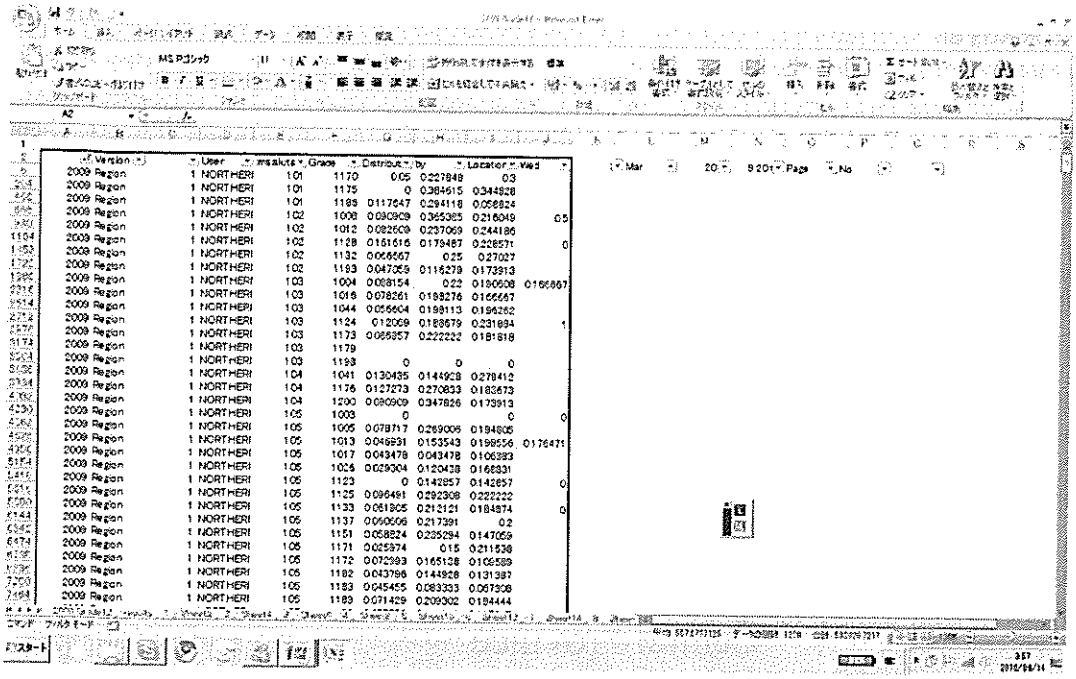
5．「開発」→「マクロ」→「実行」でマクロを実行する。

6．年数が記載された行に左から、年、Region、州コード、州名、郡コード、学校コード、数学、理科、生物、化学、物理の順に数字が記載される。

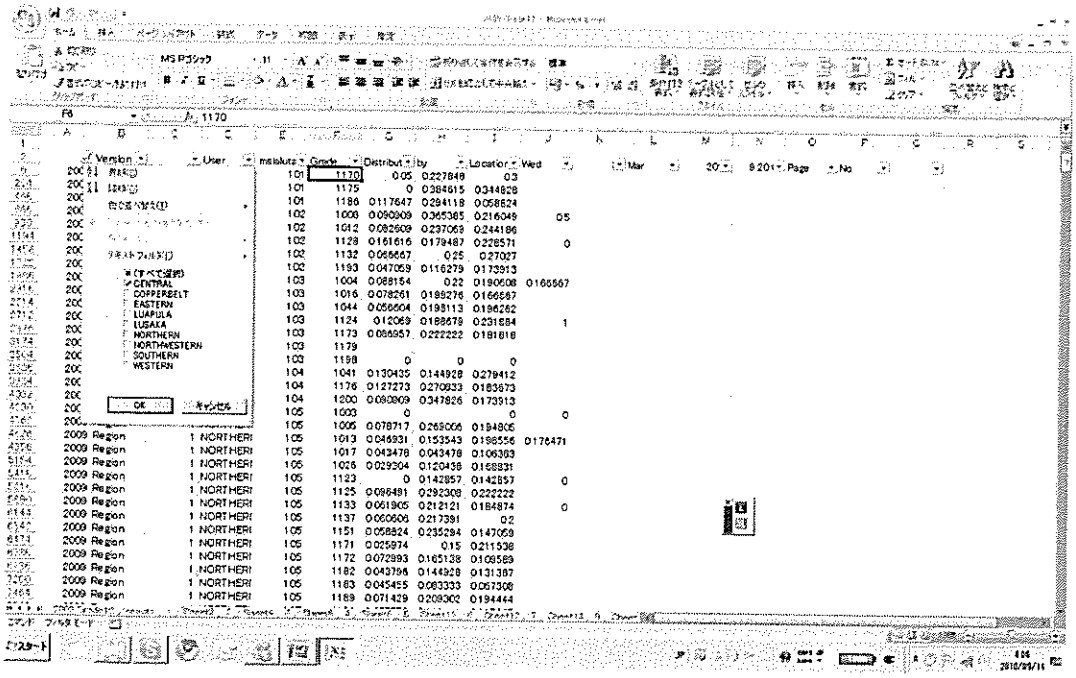
7．フィルターにより A 列の年が記載された行を抽出する。



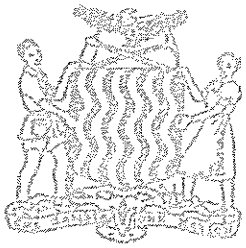
8．ソートの結果をコピー、Result に貼り付ける。



9．フィルターにより、合格率データが必要な州を抽出し、使用する。



以上



Republic of Zambia

Ministry of Education

Central Province

Report on the Impact Assessment of the School-based Continuing Professional Development Programme in Central Province

October 2010

Table of Contents

1. INTRODUCTION

1.1 Background to the Programme

In 2006, the Strengthening of Mathematics, Science & Technology Education – School-Based Continuing Professional Development (SMASTE-SBCPD) Project was initiated in Central Province, Zambia, to improve teaching/learning activities in the classroom through 'lesson studies'. The Project works in collaboration with and also provides technical assistance to the existing School Program of In-service for the Term (SPRINT). Currently SMASTE-SBCPD (hereafter, the SBCPD programme) is being promoted as a programme of the Zambian Ministry of Education, using SPRINT as a framework.

1.2 Purpose of Impact Assessment

In order to understand the impact of the SBCPD programme, especially the impact of lesson study activity[1] at the school level, the Ministry of Education of Zambia requested technical assistance. To that end, the Japan International Cooperation Agency (JICA) short-term expert was deputed to support the implementation of the impact assessment. The impact of the SBCPD programme on the pupils' achievements in the field of science and the factors promoting and hindering the SBCPD programme in Central Province were described and identified by the impact assessment team[2]. The impact assessment generated information that can be used by the Ministry of Education, JICA, and other donors to gauge the effectiveness of the SBCPD programme and can inform decisions about the design of future programmes.

1.3 Period of Assessment

The impact assessment was conducted from 29 August 2010 to 22 October 2010 (For details, see **Annexe 9**).

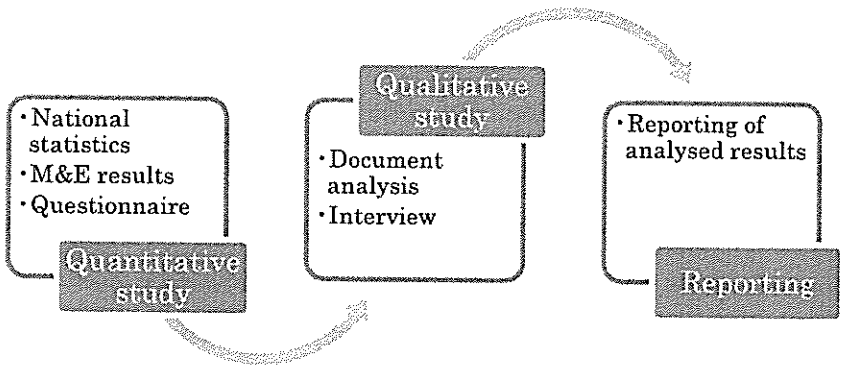
1.4 Methodology

The research design combined quantitative and qualitative methods. The quantitative part of the study employed a difference-in-difference approach by using data collected from the Examinations Council of Zambia (ECZ). The quantitative data from a questionnaire survey were also statistically analyzed (correlation analysis) with SPSS and combined with qualitative

[1] The lesson study activity is one of the components of the SBCPD programme.
[2] The impact assessment team was composed of senior education standard officers in mathematics and science, resource centre coordinators from Central Province and a JICA short-term expert.

information collected through interviews.

The qualitative part consisted of document analysis and interviews with several kinds of stakeholders (**see 1.7, Sampling**) to identify the effects that may not emerge from the quantitative analysis, as well as to discover the reasons for the impact measured by quantitative analysis. All the interview sessions were recorded on audiotapes, and transcripts were then prepared by the assessment team members.



1.5 Causal Model

This impact assessment was carried out on the basis of the causal model (shown in **Table 1**). The causal model indicates the programme outputs and outcomes that were expected to be generated between programme activities and the expected impact. The model lists programme activities in the left-hand column of the table. Most SBCPD activities lead to the programme outputs listed in the second column. The actual implementation and monitoring of SBCPD at the school level lead to a range of intended outcomes. These in turn should help to bring about the impact shown in the last column. While outputs and outcomes of the SBCPD programme have already been confirmed in the results of the end-line survey[3], visible impact were expected to be revealed in the combined results of various outcomes.

[3] For the end-line survey, 493 lesson observations and questionnaires administered to 240 school heads, 343 teachers, and 5,200 pupils from July to September 2010 in Central, Copperbelt, and North Western Provinces were used.

Table 1: Causal model

Activities	Outputs	Outcomes	Impact
-Train facilitators -Conduct stakeholder and facilitator workshops -Produce teaching skills and management book -Develop monitoring instruments	-Schools conducting SBCPD activities -Availability of teaching skills book - SBCPD monitoring conducting	-Improved lessons -Improved teaching process -Improved pupil learning -Improved school management	-Enhanced achievement of pupils

1.6 Key Evaluation Questions

The following key evaluation questions were set on the basis of the purpose of assessment:

1. Have the SBCPD activities had a positive impact on the results of national examinations in Central Province?
2. Have the SBCPD activities had a positive impact on teachers' attitudes, teaching processes, and pupil attitudes?
3. What background factors have made an impact on the effects identified?

1.7 Data Collection

Analysis of the national examination

A database of the pass rate for the national examination in grade 12, collected from the ECZ, was used for the difference-in-difference analysis with data on Central Province and non-targeted provinces[4] before and after the SBCPD programme intervention. The pass rate was compiled from the data on each examination centre, including the internal candidates as well as the Academic Production Unit (APU) and General Certificate of Education (GCE)[5] candidates.

Table 2: Number of examination centres in non-target provinces and Central Province

	2005	2006	2007	2008	2009
Non-target provinces	432	434	448	480	481
Central Province	57	59	60	76	81

[4] Exclude Copperbelt and North Western Province, which have already had an intervention of the SBCPD programme.

[5] The results of the national examination for APU and GCE in Central Province have also been affected by the teachers trained in the SBCPD programme.

Field survey

The assessment team visited 29 high schools[6] in Central Province (see **Annexe 3**) in order to verify SBCPD documentation and collect questionnaires. Questionnaires (see **Annexes 5, 6, 7, 8**) were distributed to and collected from all those schools. Then, interviews of school heads, facilitators in science, and science teachers were conducted according to the interview schedule (see **Annexe 4**) in the selected schools. In order to identify the factors that affect the implementation of SBCPD and the national examination, the five schools with the highest and lowest pass rates[7] were selected as the target schools for interview sessions.

Table 3: Participants for questionnaires

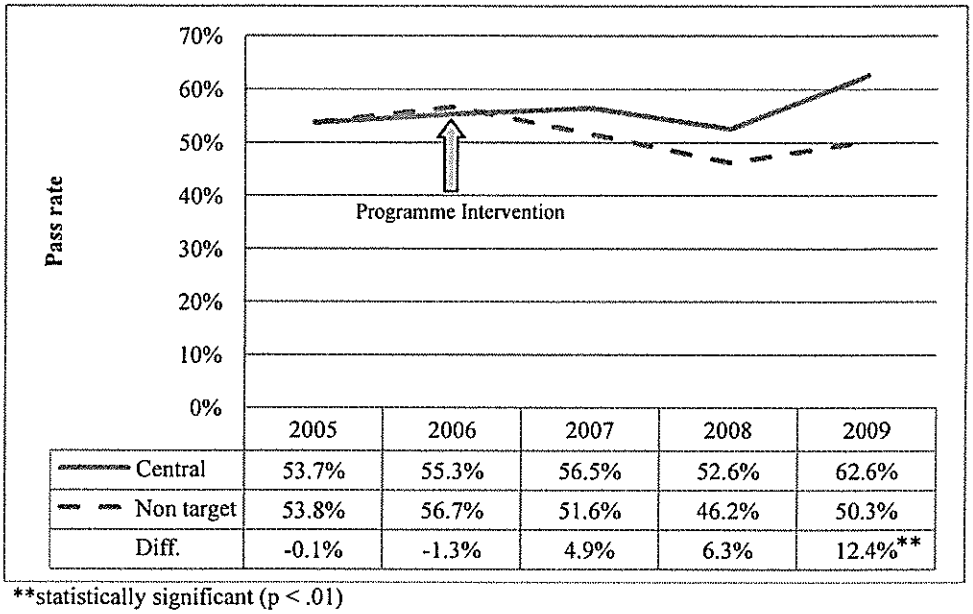
Participants	Questionnaire	Interview
School heads	29	10
Facilitators	23	10
Science teachers	136[8]	15
Pupils (Grade 12)	280[9]	-

[6] Of the 33 high schools in Central Province, 3 private schools and 1 newly established high school were not visited during this assessment because of time constraints.
[7] Schools were selected on the basis of the pass rate revealed by the ECZ data in 2009.
[8] The total number of science teachers is 209, as per the questionnaire results.
[9] The total number of pupils in grade 12 is 7,817, as per the Educational Statistical Bulletin 2009.

2. FINDINGS

2.1 Pass Rate in Science

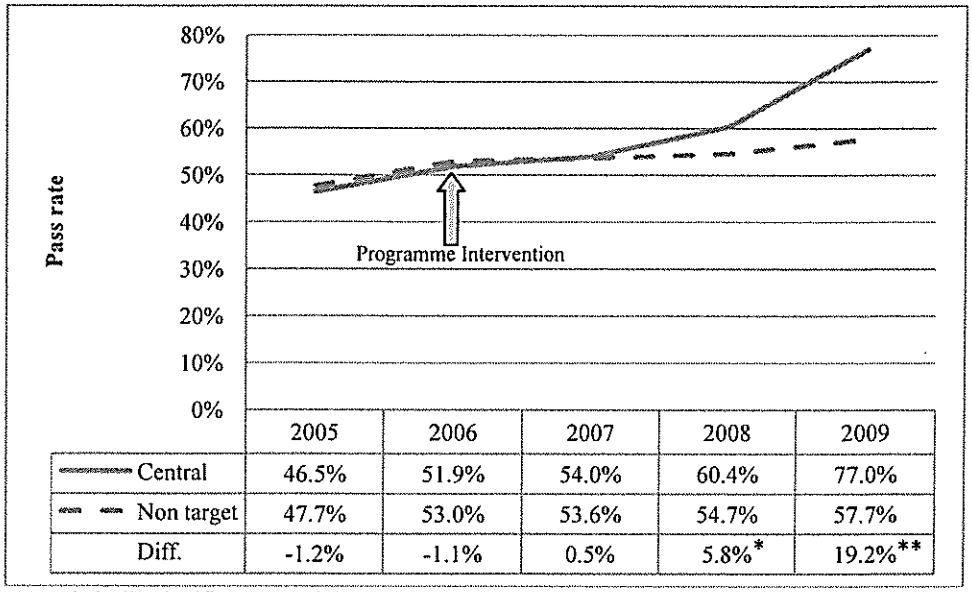
Although pass rates for science and biology in Central Province were lower than those for non-target provinces before the beginning of SBCPD intervention, these pass rates have improved since the initiation of the programme. The difference between Central Province and non-target provinces in 2009 was 12.4% in science and 19.2% in biology. The results of statistical analysis (t-test) also showed that those differences were statistically significant at the 1% level.



	2005	2006	2007	2008	2009
Central	53.7%	55.3%	56.5%	52.6%	62.6%
Non target	53.8%	56.7%	51.6%	46.2%	50.3%
Diff.	-0.1%	-1.3%	4.9%	6.3%	12.4%**

**statistically significant ($p < .01$)

Figure 1: Pass rate for science



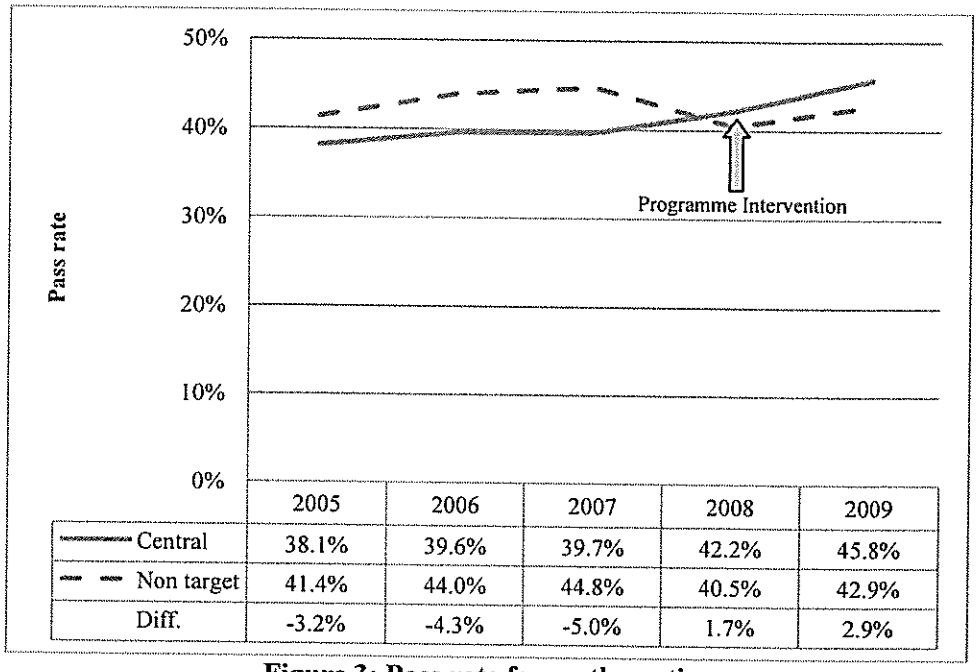
	2005	2006	2007	2008	2009
Central	46.5%	51.9%	54.0%	60.4%	77.0%
Non target	47.7%	53.0%	53.6%	54.7%	57.7%
Diff.	-1.2%	-1.1%	0.5%	5.8%*	19.2%**

**statistically significant ($p < .01$)
*statistically significant ($p < .05$)

Figure 2: Pass rate for biology

2.2 Pass Rate in Mathematics

The pass rate for mathematics, which may be affected by the intervention of the SBCPD programme started in 2008[10], was also analysed as a comparison subject. Although the pass rate for mathematics has also improved since the beginning of the programme, a significant difference between Central Province and non-target provinces has not been observed. This indicates that tangible impact on the pupils' achievement became evident after a certain period of the SBCPD programme intervention at the school level.



	2005	2006	2007	2008	2009
Central	38.1%	39.6%	39.7%	42.2%	45.8%
Non target	41.4%	44.0%	44.8%	40.5%	42.9%
Diff.	-3.2%	-4.3%	-5.0%	1.7%	2.9%

Figure 3: Pass rate for mathematics

2.3 Pass Rate with Quality

The percentage of pass rates with quality[11] in both science and biology was almost at the same level for Central Province and non-target provinces before the intervention of the programme in 2005. Then, in 2009, the percentage of passes with quality increased significantly in Central Province compared with the non-target provinces. This indicates that a high level of pupils' understanding of this subject has been achieved in Central Province.

[10] SMASTE-SBCPD Project phase II, which covered all subjects in Central Province, was initiated in 2008.

[11] A quality pass is given to the pupils who score from level 1 to 6.

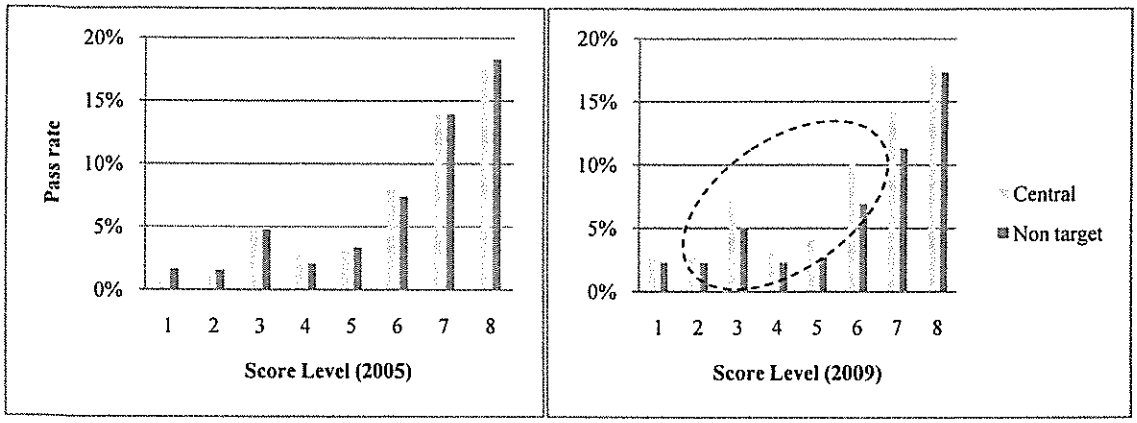


Figure 4: Pass rate by score level for science

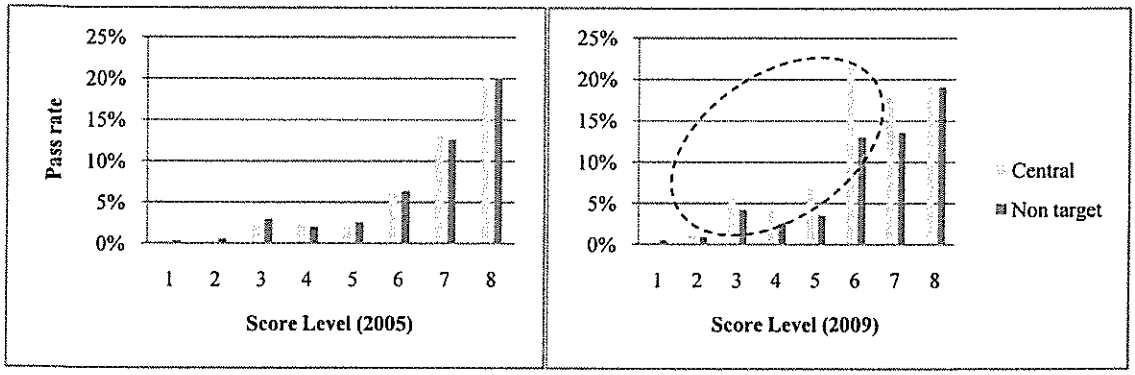


Figure 5: Pass rate by score level for biology

2.4 Correlation between Pass Rate and SBCPD Implementation Level

The results of the correlation analysis (see **Figure 6**) showed a significant relationship between SBCPD implementation level and the pass rate for the national examination in science, $r = .70$[12], $p < .01$. This means that as SBCPD implementation levels increase, the pass rate increases. The SBCPD implementation level of each high school was measured by examining SBCPD documents such as observation instruments, teachers' lesson plans, and SBCPD action plans during the school visit, and each school was rated according to the criteria (see **Table 4**).

[12] The correlation coefficient is a measure used for the size of an effect: values of ±.1 represent a small effect; ±.3, a medium effect; and ±.5, a large effect. Field, A. P. (2009). *Discovering statistics using SPSS*. London: Sage.

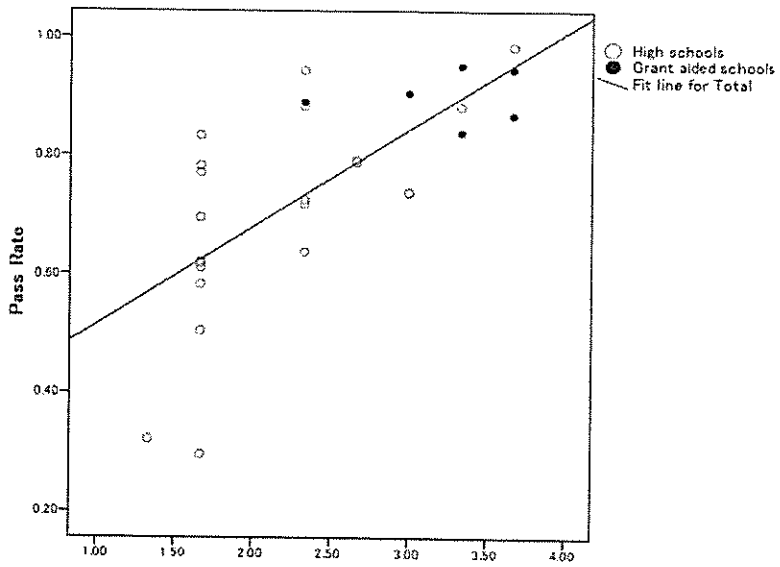


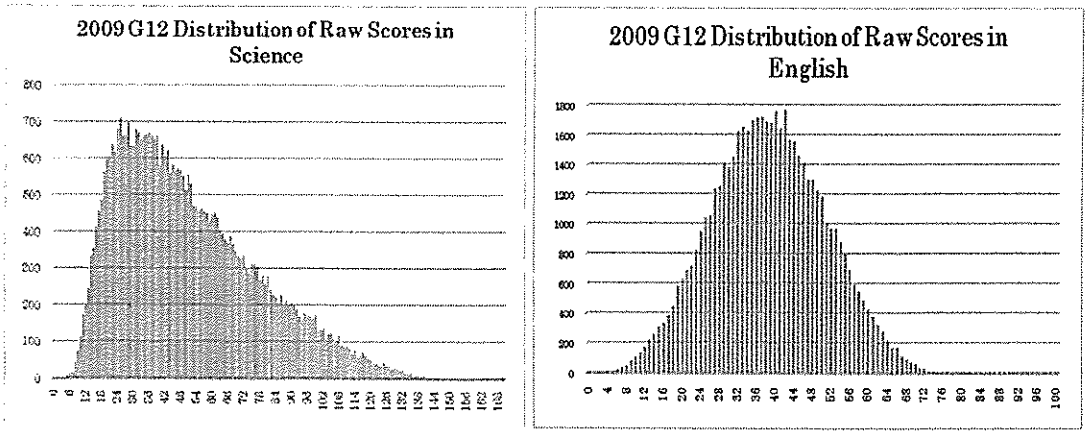
Figure 6: Correlations between pass rate and SBCPD implementation level

Table 4: Criteria to differentiate SBCPD implementation levels

Rating	Lesson Observation Instruments	Lesson Plans	SBCPD Action Plan
0	No observation instrument at all	No lesson plan at all	No SBCPD action plan at all
1	There are some observation instruments but they are not updated	There are some lesson plans but they are not updated	There is an action plan but it is not updated
2	Observation instruments for SBCPD are updated	Some teachers prepare lesson plan	There is an SBCPD action plan for the current term
3	Observation instruments are used not only for SBCPD but also for regular internal monitoring	All teachers prepare lesson plans	SBCPD is recorded according to the action plan
4	Observation instruments are also used by head or deputy head	Lesson plan is checked by head of department or deputy head	Action plan is revised according to the progress of SBCPD

2.5 Impact of SBCPD Implementation on Pass Rate

The pass rate in science is extremely low compared to that for other subjects, as shown in **Figure 7**. About 30% of candidates get less than 20% of the total score. This means that there is higher potential for enhancement of pupils' achievements in science than in other subjects. In other words, even with minimal effects of the SBCPD programme, a positive impact on the results of the national examination in science was expected. While the SBCPD programme started by targeting science in Central Province, intensive input focused on the capacity development of facilitators and teachers in science appeared to contribute to the increase in pass rate.



Source: Examination Council of Zambia (ECZ)

Figure 7: Distribution of raw scores in science and English

The results of qualitative analysis through interviews also showed that SBCPD activities at the school level have contributed to the increase in pass rates for examinations.

> *The SBCPD activities are also contributing to an improvement in the results of the mock examinations, because of the teachers' interactions and sharing of knowledge; when you are stuck and can't understand something, you can share your problem with friends. They can teach the topic on behalf of you or you can learn about it from them. We are thus now able to tackle even difficult topics. We do not avoid them. So pupils cover most of the topics. As a result, the pass rate for exams improves. (Facilitator)*

> *Since the pass rate for the national examination in science depends on effective and efficient lesson delivery, SBCPD activities indeed help pupils acquire relevant knowledge and skills. (Science Teacher)*

> *It [SBCPD] has built up teachers' confidence in their teaching. These teachers came from different colleges; sometimes they may not understand certain concepts well. So when they share activities and look at the different topics together, it helps them a lot. (Facilitator)*

2.6 Factors Promoting or Hindering SBCPD Implementation

Figure 8 shows the correlation coefficients of each variable. These positive and negative variables were identified through interviews with stakeholders, and then the relationships

between the SBCPD implementation level and each variable were verified by means of correlation analysis. The interpretations of each factor are as shown below.

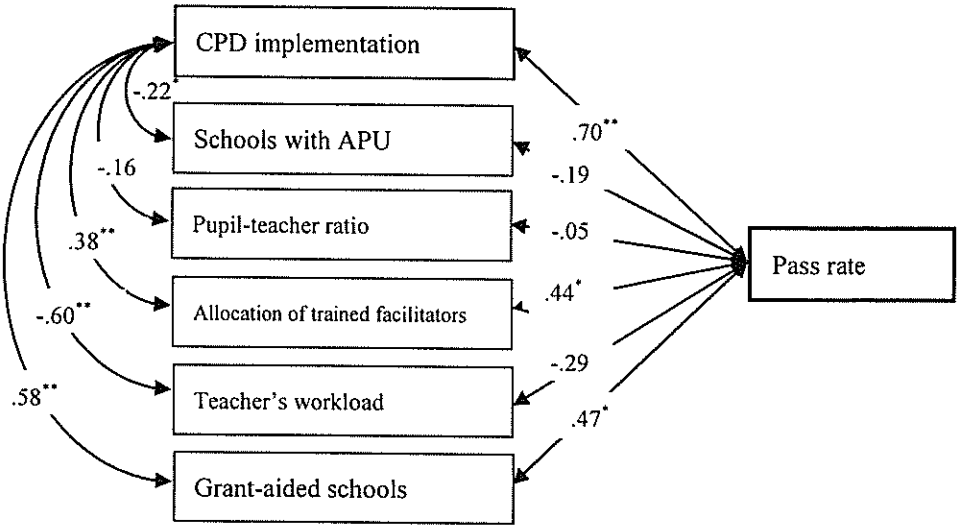


Figure 8: Correlations between SBCPD implementation and pass rate

School with APU

As teachers expressed that their participation in APU preparation classes has been minimizing their time to prepare SBCPD activities, the factor of a school being an APU one appears to be negatively related to SBCPD implementation, $r = -.22$, $p < .05$. The disadvantages for SBCPD activities in the schools with APU classes were also identified by several stakeholders.

> *In the APU schools, teachers have insufficient time, because they teach from the morning to the afternoon. There is no time to sit down and prepare for class. Honestly speaking, that is an issue. (Facilitator)*

> *I teach in the morning and the afternoon until 18:00 hours. We are very tired after this, and then we have to prepare all the lessons for following day, for morning and afternoon sessions. (Science Teacher)*

Pupil-teacher ratio

A high pupil-teacher ratio has a negative relationship with SBCPD implementation r =.-16. The average pupil-teacher ratio in science is 45.1 pupils per teacher, but this ratio differs according to the type of school; the average ratio in high schools (47.3 pupils per teacher) is much higher than that in grant-aided schools (36.8 pupils per teacher). Although a high pupil-teacher ratio

with overcrowded classes was not a strong negative factor for SBCPD implementation, the increase in teachers' burdens has been affecting the preparation of lesson plans and implementation of learner-centred lessons. Science teachers emphasized some negative aspects of SBCPD implementation due to high pupil-teacher ratios:

> *A negative factor must be the number of pupils in the class; the number is quite high and affects especially the group activities. (School head)*

> *APU classes are too big. There are 85 pupils in a class. Even if they wanted to do some activities, the number of groups is too high. So it affects our experimenting in class. But morning classes, it is OK. All classes are not so much. There are less than 40 pupils in a class. (Facilitator)*

Allocation of trained facilitators

The allocation of trained facilitators was significantly related to the SBCPD implementation level, $r = .38$, $p < .01$. This factor was also correlated with the pass rate, $r = .44$, $p < .05$. Since the beginning of the programme, more than 80 facilitators in science have been trained in Kenya, Malaysia, or Japan. In Central Province, 62% of high schools still have at least one facilitator in science trained overseas. In general, these facilitators are also posted as heads of science departments, and they play an important role in promoting the SBCPD at the school level. The importance of facilitators in involving science teachers in SBCPD activities was also suggested during interview sessions:

> *Although teachers have realized the positive aspects of SBCPD, they feel it is waste of time. Once someone has this kind of attitude, it is difficult to convince them. (Facilitator)*

> *Keep looking at the positive results of pupils. At the end of the day, show the results to the teachers. It is good to look at the results that they have achieved. This will strengthen the activities. (Facilitator)*

> *We normally try to explain to teachers the importance of SBCPD meetings. They also appreciate the importance of attending these meetings because their absence isolates them. They cannot learn how other teachers teach if they don't attend, so they are always present. (Facilitator)*

Teacher's workload

Teacher workload was negatively related to the SBCPD implementation level, $r = -.60$, $p < .01$. This means that as the workloads of teachers increase, SBCPD implementation levels decrease. In general, the workload of science and mathematics teachers remains relatively high compared with that of other teachers, due to a severe teacher shortage in these subjects. On average, the workload of science teachers is 28.1 periods per week, but this is also different for high schools (28.4 periods per week) and grant-aided schools (26.8 periods per week). This high workload of science teachers interfered with the preparation of lesson plans, in particular.

> *....but during the time to conduct SBCPD, their loads are quite large, and the last term was even heavier than this one. An average load was 30 hours or above per week. There is no time to prepare lesson plans. (Facilitator)*

> *For us, staffing is a challenge. We are three in the department and each have a minimum of 40 periods per week; we have no time to sit together for SBCPD. We are understaffed, so there is no consistency in the staffing level and the number of pupils. (Science Teacher)*

Grant-aided school

The results showed that both the pass rate and SBCPD implementation was positively related to whether the school is a grant-aided school or not, $r = .47$, $p < .05$ for the pass rate and $r = .58$, $p < .01$ for the SBCPD implementation level. Grant-aided schools normally take a conservative approach to school management and claim to be the secondary school system that most positively affects the achievement of pupils. These grant-aided schools also enjoy several advantages in the implementation of SBCPD, such as a smaller workload for teachers, lower pupil-teacher ratios, and sufficient budgets and science facilities supported by their church missions. Most grant-aided schools have also established accurate internal monitoring systems to keep track of the quality of SBCPD activities.

> *As the administration, we conduct a follow-up. This makes them do what they are supposed to do. The people involved, like the head and deputy, are very serious. Teachers are serious at the beginning; they never waited to involve themselves. It was difficult for them, I know, because teachers could not take in new things easily. So these follow-ups just make it [SBCPD] more serious; I think it paved the way for*

success. (School Head)

I think that the culture has been established. At first, it was difficult when I wanted to observe teachers; they would ask 'Why you are observing me without telling me beforehand that you will?' So we made it clear to them that observation was not something to be arranged and teachers should be prepared all the time. Finally, teachers have accepted this and it is part of our work. (Deputy Head)

2.7 Correlation between SBCPD Implementation Level and Learner-centred Lesson

Figure 9 shows the positive relationship between SBCPD implementation and the promotion of learner-centred lessons in a classroom[13], $r = .33$, $p < .05$. This means that as SBCPD implementation levels increase, leaner-centred lesson levels also increase. While the national examination in science does include practical components, SBCPD activities that emphasize group work and experiments in the classroom may have a positive impact on this practical component of the national examination. However, as there is no significant correlation between the pass rate and level of learner-centred lessons, further research on the impact of learner-centred lessons on pupil achievements is required.

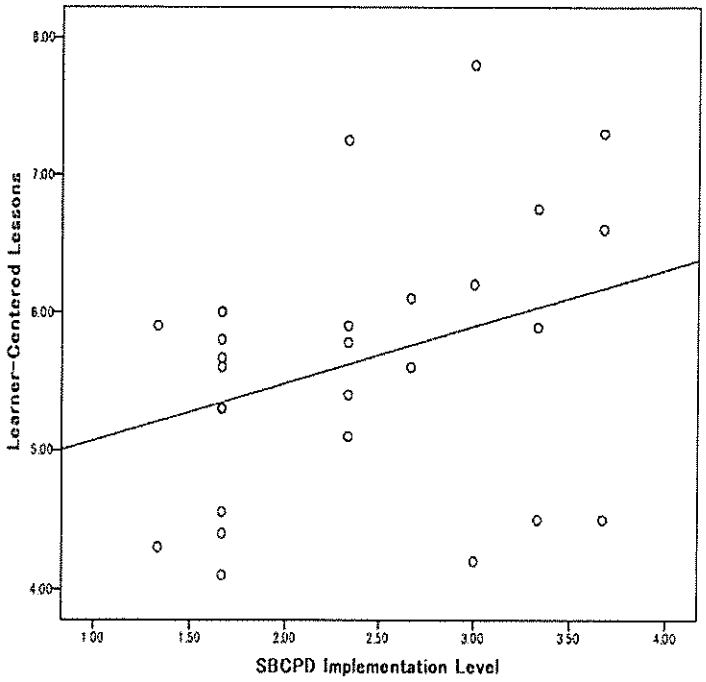


Figure 9: Correlation between learner-centred lessons and SBCPD implementation level

13 The level of learner-centred lessons in classrooms was measured by using the answers of pupils to the questionnaire (total score of questions to pupils No.1 and No.2, in Annexe 8).

The promotion of learner-centred lessons was also cited as an advantage of SBCPD activities at the school level:

> *Learners are being exposed to a lot of hands-on activities which help them to handle their practical examinations with less tension. (Deputy Head)*

> *Girls' participation has improved as they discuss questions with their peers. (School Head)*

> *Pupils are involved in lessons, and this enhances their ability to recall whatever they learn. (Science Teacher)*

> *Pupils can tackle difficult questions because they are able to hypothesize answers before actually stating their response. (Facilitator)*

On the other hand, many stakeholders suggested that one of the main challenges in conducting learner-centred lessons in their classrooms was the lack of materials:

> *We lack some teaching materials that are difficult to improvise, such as reactive metals. Hence, we do not really enhance learners' understanding as some topics are still taught theoretically. (Science Teacher)*

> *The financial factor is our major challenge. Science subjects require a lot of practical work and need chemicals that are not cheap. Sometimes they can be improvised but sometimes not. You need to just buy these chemicals. If you do not have these chemicals, you are doing this topic theoretically instead of doing practically. (Facilitator)*

2.8 Issues of Monitoring

During our school visits, we noticed that monitoring was one of the major issues in the promotion of SBCPD implementation at the school level. Currently, monitoring is carried out by checking reports submitted to district and provincial education offices. Although most high schools have been monitored at least once per term, the nature of this monitoring ensures that it does not contribute much to improving the quality of SBCPD activities. The challenges of monitoring were identified by several stakeholders:

District officers come to monitor this SBCPD, but when they come, they check all records and ask 'How many cycles did you conduct in the year?' They just check, but do not going deep into it, for instance, looking at the quality of SBCPD. It is very easy to produce such records, even when we did not conduct. We can give you these, if you are asking for. (School Head)

Most lesson plans are written in order to keep the file up-to-date, not really to prepare for lessons in the classroom. (Science Teacher)

3. RECOMMENDATIONS

3.1 Recommendations

1. Since the SBCPD implementation has a positive impact on pupil achievements, especially with regard to the pass rate for national examination in science, the validity of rolling out SBCPD to other regions was recognised. However, the impact of SBCPD on other subjects and basic schools should also be assessed and the identified lessons used to make necessary changes before the expansion of the programme.

2. The importance of external monitoring and supervision by standard officers for the sustainability of SBCPD at the school level is evident. Although internal monitoring systems have been established in some schools, without the supervision of external monitoring, SBCPD activities easily decline in quality and quantity. Building the capacity of Provincial, District and Zone Education Support Teams (PEST, DEST, and ZEST) through external monitoring is also recommended.

3. The time factor is the major constraint to SBCPD implementation at the school level. The top management of schools should promote the effective implementation of SBCPD and enhance teachers' understanding of its importance.

4. The transfer or leave of trained facilitators has hindered SBCPD activities. It is necessary to secure at least one trained facilitator for each subject. Their capacity development should also be continued through facilitator workshops, as an incentive to promote SBCPD in their schools.

5. For effective use of the results of the base-line and end-line surveys, the data resources should be related (the same schools should be targeted). The related background data (type of school, teaching environment, etc.) for each school and stakeholder should also be collected for factor analysis.

6. Schools must be funded to procure science materials for the effective implementation of SBCPD activities.

3.2 Limitations of Assessment

In order to obtain further concrete evidence of the impact of the SBCPD programme, additional samples[14] are required for a more complex measure of the relationship, using analysis on multiple regressions. Another limitation might be the accuracy of the national examination scores; some examination frauds have been pointed out by stakeholders. In future assessments, these issues should be taken into account.

[14] In order to test the overall fit of the multiple regression analysis, a minimum sample size of 50+8k is recommended, where 'k' is the number of predictors. Green, S, B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioural Research, 21,499-510*

4. CONCLUSION

The difference-in-difference analysis of the results of national examinations in grade 12 have shown an increased pass rate in the field of science in Central Province, through a comparison of the periods before and after the interventional programme. We found that the implementation level of SBCPD activities at each high school was also significantly correlated with its pass rate. One implication of these findings is that SBCPD activities had a positive impact on the pass rate in the national examination.

The qualitative part of this assessment, done through interviews with several types of stakeholders, also suggests the importance of SBCPD activities for pupil achievements, as indicated by most respondents. Most of the interviewees stated that SBCPD benefits teachers in preparing lessons and promoting peer activities, enhances their confidence in teaching difficult topics, etc. In addition, we found a positive correlation between SBCPD implementation and the promotion of learner-centred lessons in the classroom. Since more than one-third of candidates fail the national examination in science, it appears that this positive impact of SBCPD on the teaching process was one of the factors for the improvement of pupil achievements in this subject.

Finally, we conclude that there are both positive and negative factors affecting SBCPD implementation at the school level. Several factors affected the progression of SBCPD activities; however, it must be noted that grant-aided schools have more of an advantage in the effective implementation of SBCPD activities than do other high schools. General aspects of grant-aided schools, strong leadership of school heads, smaller teaching workload, and sufficient science materials may lead these schools to promote SBCPD effectively. It was also found that the allocation of trained facilitators was one of the important factors for effective SBCPD implementation. In most cases, facilitators are also heads of department who play an important role in SBCPD activities. The major constraint to SBCPD implementation was shortage of time for teachers to prepare lesson plans and SBCPD cycles. The reality of an insufficient number of science teachers, an increase in the number of pupils, and the need for afternoon classes of APU have also imposed large workloads on science teachers.

On the basis of these findings, we made recommendations for the future strategy of the programme.

Annexe 1: t-test (Analysis for pass rate of national examination)

2009

Group Statistics

	Input	N	Mean	on	Std.Error Mean
Math	National	481	.4286	.22500	.01026
	Central Province	81	.4578	.24939	.02771
Science	National	476	.5025	.25123	.01152
	Central Province	81	.6263	.24371	.02708
Bio	National	463	.5774	.24520	.01140
	Central Province	81	.7699	.19590	.02177

Independent Samples Test

		Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std.Error Difference	Interval for Mean Bound	Bound
Math	Assume equal variances	2.292	.131	-1.062	560	.289	-.02917	.02746	-.08311	.02477
	Does not assume equal variances			-.987	103.110	.326	-.02917	.02955	-.08777	.02943
Science	Assume equal variances	.296	.586	-4.117	555	.000	-.12380	.03007	-.18286	-.06474
	Does not assume equal variances			-4.207	110.937	.000	-.12380	.02943	-.18211	-.06549
Bio	Assume equal variances	10.660	.001	-6.699	542	.000	-.19248	.02873	-.24892	-.13603
	Does not assume equal variances			-7.834	128.194	.000	-.19248	.02457	-.24109	-.14386

2008

Group Statistics

	Input	N	Mean	on	Std.Error Mean
Math	National	480	.4046	.23808	.01087
	Central Province	76	.4218	.22866	.02623
Science	National	477	.4624	.26228	.01201
	Central Province	76	.5258	.26306	.03018
Bio	National	471	.5466	.27257	.01256
	Central Province	75	.6044	.21562	.02473

Independent Samples Test

		Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std.Error Difference	Interval for Mean Bound	Bound
Math	Assume equal variances	.015	.902	-.589	554	.556	-.01721	.02924	-.07464	.04022
	Does not assume equal variances			-.606	102.485	.546	-.01721	.02839	-.07352	.03910
Science	Assume equal variances	.081	.776	-1.957	551	.051	-.06341	.03241	-.12707	.00025
	Does not assume equal variances			-1.952	100.243	.054	-.06341	.03248	-.12784	.00102
Bio	Assume equal variances	6.633	.010	-1.760	545	.079	-.05775	.03281	-.12221	.00671
	Does not assume equal variances			-2.082	117.419	.040	-.05775	.02774	-.11268	-.00281

2007

Group Statistics

	Input	N	Mean	on	Std.Error Mean
Math	National	448	.4476	.23695	.01119
	Central Province	60	.3972	.19667	.02539
Science	National	444	.5160	.23906	.01135
	Central Province	60	.5649	.24065	.03107
Bio	National	443	.5357	.24732	.01175
	Central Province	60	.5404	.24422	.03153

Independent Samples Test

		Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std.Error Difference	Interval for Mean Bound	Bound
Math	Assume equal variances	4.833	.028	1.574	506	.116	.05035	.03198	-.01248	.11317
	Does not assume equal variances			1.814	83.752	.073	.05035	.02775	-.00484	.10553
Science	Assume equal variances	.156	.693	-1.488	502	.137	-.04896	.03291	-.11362	.01569
	Does not assume equal variances			-1.480	75.605	.143	-.04896	.03307	-.11484	.01691
Bio	Assume equal variances	.192	.662	-.139	501	.890	-.00471	.03397	-.07145	.06204
	Does not assume equal variances			-.140	76.331	.889	-.00471	.03365	-.07172	.06230

2006

Group Statistics

	Input	N	Mean	on	Std. Error Mean
Math	National	434	.4395	.24086	.01156
	Central Province	59	.3963	.18666	.02430
Science	National	427	.5668	.24845	.01202
	Central Province	59	.5535	.21638	.02817
Bio	National	433	.5299	.26098	.01254
	Central Province	59	.5191	.21708	.02826

Independent Samples Test

		Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval for Mean Bound	Interval for Mean Bound
Math	Assume equal variances	8.077	.005	1.325	491	.186	.04323	.03262	-.02087	.10733
	Does not assume equal variances			1.606	86.636	.112	.04323	.02691	-.01026	.09672
Science	Assume equal variances	2.850	.092	.392	484	.695	.01335	.03400	-.05347	.08016
	Does not assume equal variances			.436	80.691	.664	.01335	.03063	-.04760	.07429
Bio	Assume equal variances	5.639	.018	.303	490	.762	.01079	.03555	-.05906	.08064
	Does not assume equal variances			.349	82.664	.728	.01079	.03092	-.05071	.07229

2005

Group Statistics

	Input	N	Mean	on	Std. Error Mean
Math	National	432	.4139	.24261	.01167
	Central Province	57	.3815	.18941	.02509
Science	National	421	.5378	.26636	.01298
	Central Province	56	.5370	.19535	.02611
Bio	National	426	.4769	.26585	.01288
	Central Province	57	.4645	.24134	.03197

Independent Samples Test

		Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Interval for Mean Bound	Interval for Mean Bound
Math	Assume equal variances	5.547	.019	.970	487	.333	.03241	.03341	-.03324	.09806
	Does not assume equal variances			1.171	82.368	.245	.03241	.02767	-.02263	.08745
Science	Assume equal variances	10.004	.002	.024	475	.981	.00087	.03686	-.07156	.07330
	Does not assume equal variances			.030	84.885	.976	.00087	.02915	-.05710	.05884
Bio	Assume equal variances	2.021	.156	.333	481	.739	.01237	.03711	-.06054	.08529
	Does not assume equal variances			.359	75.399	.721	.01237	.03446	-.05628	.08102

Annexe 2: Correlation Coefficients (Analysis for results of questionnaires)

1. Correlation coefficients for positive and negative factors analysis

		Pass rate	SBCPD implementation	Grant aided school	Schools with APU	Pupil-teacher ratio	Facilitator
SBCPD implementation (According the criteria shown in **Table 3**)	Pearson Correlation	.702**					
	Sig. (2-tailed)	.000					
	N	28					
Grant aided school (0=No grant aided school, 1=Grant aided school)	Pearson Correlation	.468*	.582**				
	Sig. (2-tailed)	.012	.001				
	N	28	29				
Schools with APU (No APU school 0, APU school1)	Pearson Correlation	-.188	-.217	-.653**			
	Sig. (2-tailed)	.338	.259	.000			
	N	28	29	29			
Pupil-teacher ratio (Number of pupil per teacher)	Pearson Correlation	-.046	-.159	-.436*	.570**		
	Sig. (2-tailed)	.816	.411	.018	.001		
	N	28	29	29	29		
Allocation of facilitator (0=No trained facilitator, 1=Trained facilitator)	Pearson Correlation	.436*	.384*	.224	.121	.211	
	Sig. (2-tailed)	.020	.040	.243	.531	.272	
	N	28	29	29	29	29	
Teacher's workload (Teaching periods per week)	Pearson Correlation	-.294	-.603**	-.252	-.024	.108	-.272
	Sig. (2-tailed)	.129	.001	.188	.903	.576	.154
	N	28	29	29	29	29	29

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.5 level (2-tailed).

2. Correlation coefficient for learner-centered lesson analysis

		Pass rate	Learner-centered
Learner-centered lessons Questionnaire to pupils (Q1+Q2)	Pearson Correlation	.192	
	Sig. (1-tailed)	.169	
	N	27	
SBCPD implementation (According the criteria shown in **Table 3**)	Pearson Correlation	.702**	.331*
	Sig. (1-tailed)	.000	.043
	N	28	28

**. Correlation is significant at the 0.01 level (one-tailed).

*. Correlation is significant at the 0.5 level (one-tailed).

Annexe 3: Data Table

No.	Code	District	School			Pass rate	secondar	APU	Bording	LO	LP	AP	Av.CPD	Mteach	Fteach	Fteache	Av.Class	facilitato	xperienc	Workloa	Qual	TQ7	TQ8	TQ12	TQ17	SQ1	SQ2	SQ12Av.	SQ3	SQ4	SQ1234	SQ5	SQ8
1	7030	1	MUPEPETWE	HIGH	SCHOOL	0.637615	0	1	0	3	2	2	2.33	5	0	0.00	41	0	5.40	28	2.00	4.80	4.20	4.60	2.75	2.89	2.89	2.89	3.22	4.22	4.22	3.00	4.70
2	7006	1	IBOLELO	SECONDARY	SCHOOL	0.833465	0	1	0	1	2	2	1.67	7	2	0.22	49	1	5.20	28	2.00	4.00	4.80	3.60	3.25	2.90	2.70	2.80	1.90	4.20	4.20	2.80	4.40
3	7018	1	SERENJE	SECONDARY	SCHOOL	0.984489	0	1	1	3	4	4	3.67	10	2	0.17	34	1	13.60	24	2.00	4.40	4.20	4.20	3.00	2.10	2.40	2.25	2.50	1.80	1.80	1.27	4.55
4	7002	2	CHALATA	SECONDARY	SCH	0.792683	0	1	0	3	3	2	2.67	3	0	0.00	58	1	9.33	30	2.00	4.66	4.66	3.33	2.66	3.60	2.50	3.05	2.60	2.90	2.90	2.90	4.10
5	7016	2	MKUSHI	COPPER	MINE	0.882709	0	1	0	3	4	3	3.33	4	2	0.33	55	1	15.75	24	2.00	5.00	4.75	4.25	2.66	2.67	3.22	2.94	3.56	2.78	2.78	1.44	4.33
6	7015	2	MKUSHI	SECONDARY	SCHOOL	0.943925	0	0	1	2	3	2	2.33	12	2	0.14	43.5	0	10.25	28	2.50	4.67	4.67	3.75	1.75	2.90	2.20	2.55	2.20	3.20	3.20	2.90	4.50
7	7021	3	MUKONCHI	HIGH	SCHOOL	0.611495	0	1	0	1	2	2	1.67	6	3	0.33	38	1	11.60	28	2.00	4.40	5.00	4.40	2.50	2.90	3.10	3.00	2.60	2.40	2.40	2.70	2.60
8	7028	3	MPUNDE	GIRLS	SECONDARY	0.904762	1	0	1	3	4	2	3.00	4	1	0.20	35	1	10.75	25	2.00	5.00	5.00	4.75	4.50	3.70	4.10	3.90	3.50	4.00	4.00	4.00	4.90
9	7004	3	ST	PAULS	SECONDARY	0.945906	1	0	1	4	4	3	3.67	5	1	0.17	32	1	10.00	24	3.40	3.40	4.60	3.60	3.25	4.10	2.50	3.30	2.50	3.50	3.50	2.50	4.60
10	7001	4	BWACHA	HIGH	SCHOOL	0.782668	0	1	0	2	2	1	1.67	10	2	0.17	50	1		34		4.00	4.00	4.00		3.20	2.10	2.65	1.70	3.90	3.90	2.30	3.10
11	7045	4	CHINDWIN	HIGH	SCHOOL	0.695617	0	1	0	1	2	2	1.67	12		0.00	40	0	13.30	30	2.16	4.33	4.50	3.66	1.75	3.00	2.80	2.90	2.20	3.50	3.50	3.70	2.20
12	7014	4	MUKOBEKO	SECONDARY	SCHOOL	0.718447	0	0	0	2	3	2	2.33	8	2	0.20	41	1	10.30	27	2.00	2.00	4.00	4.33	2.00	2.90	2.50	2.70	2.40	3.20	3.20	2.80	4.50
13	7005	4	HIGHRIDGE	SECONDARY	SCHOOL	0.725479	0	1	0	2	3	2	2.33	5	6	0.55	58	1	14.25	18	2.00	4.50	5.00	4.00	2.30								
14	7106	4	RAPHAEL	KOMBE	HIGH	0.737752	0	1	0	3	4	2	3.00	4	5	0.56	45	1	9.50	28	3.00	4.50	5.00	4.50	2.50	2.40	1.60	2.10	2.00	4.00	4.00	2.90	4.40
15	7009	4	KABWE	SECONDARY	SCHOOL	0.738074	0	1	0	3	4	2	3.00	8	5	0.38	50	1	5.33	28	2.00	4.30	4.00	4.33	2.66	3.20	3.00	3.10	2.70	3.80	3.80	3.00	2.00
16	7217	4	JASMINE	BOYS	HIGH	0.770967	0	1	0	1	2	2	1.67	2	1	0.33	53	0	7.50	30	2.40	4.80	4.20	4.00	2.00	2.00	2.10	2.05	1.80	4.00	4.00	2.50	4.70
17	7012	4	KALONGA	SECONDARY	SCHOOL	0.789175	0	1	0	3	3	2	2.67				51	0	8.40	28	2.40	4.60	4.90	4.10	3.00	2.90	2.70	2.80	2.40	3.80	3.80	2.50	4.30
18	7121	4	STEPHEN	LUWISHA	SECONDARY	0.868132	1	0	0	4	4	3	3.67	4	2	0.33	34	0	7.66	29	2.00	4.00	5.00	3.33	4.00	3.60	3.70	3.65	3.00	2.90	2.90	3.00	4.30
19	7010	4	CARITAS	SECONDARY	SCHOOL	0.890026	1	0	0	3	2	2	2.33	1	2	0.67	35	1	8.30	32	3.00	5.00	5.00	4.33	4.00	3.30	2.60	2.95	2.30	4.10	4.10	2.90	4.40
20	7280	4	ANGELINA	TEMBO	GIRLS'	0.951631	1	0	0	3	4	3	3.33	4	0	0.00	40	1	11.00	25	2.00	5.00	5.00	4.00	4.00	2.40	2.10	2.25	1.70	3.20	3.20	2.00	3.50
21	7119	5	NAMPUNDWE	HIGH	SCHOOL	0.322511	0	0	0	1	1	2	1.33				50	0	3.70	32	2.30	4.60	4.30	2.70	2.30	2.90	3.00	2.95	3.60	3.90	3.90	2.20	4.30
22	7034	5	NAMBALA	SEC.	SCHOOL	0.505063	0	0	1	1	2	2	1.67	4	0	0.00	33	0	8.70	32	2.30	4.00	2.30	2.00	3.00	2.10	2.30	2.20	1.80	3.20	3.20	2.30	3.80
23	7013	5	MUMBWA	SECONDARY	SCHOOL	0.583321	0	1	1	1	2	2	1.67	11	2	0.15	50	1	11.30	28	2.00	4.75	5.00	4.00	1.70	3.40	2.60	3.00	2.60	3.60	3.60	2.90	4.60
24	7032	5	SANJE	HIGH	SCHOOL	0.620674	0	1	0	1	2	2	1.67	3	1	0.25		1	9.30	30	2.00	4.30	4.50	4.00	2.00	3.00	2.67	2.83	3.33	2.89	2.89	3.30	3.20
25	7295	6	MOOMBA	HIGH	SCHOOL	0.296273	0	1	0	1	2	2	1.67	6	0	0.00	40	0	4.75	24	2.00	4.25	4.75	5.00	2.67	3.10	2.20	2.65	2.70	3.80	4.22	3.90	4.80
26	7011	6	KAFUSHI	HIGH	SCHOOL	0.618182	0	1	0	1	2	2	1.67	4	1	0.20	52	0	6.80	28	2.00	5.00	5.00	3.60	3.00	2.44	2.11	2.28	2.22	4.22	4.22	2.60	4.20
27	7019	6	CHIPEMBI	GIRLS	SEC.	0.838991	1	0	1	3	4	3	3.33	5	3	0.38	45	1	9.75	26	2.25	5.00	5.00	3.25	2.30	3.25	3.50	3.38	3.13	4.25	3.78	3.90	4.40
28	7007	6	CHIBOMBO	SECONDARY	SCHOOL	0.883336	0	1	1	3	2	2	2.33	6	1	0.14	74	1	6.70	28	2.00	4.00	4.70	4.00	1.00	4.00	3.25	3.63	3.13	3.63	3.22	2.40	4.50
29	7088	6	MULUNGUSHI	AGRO		0.982143	0	0	0	1	1	2	1.33	3	0	0.00	30	0	3.50	30	3.00	5.00	5.00	4.00	4.00	2.00	2.30	2.15	2.00	2.90	3.22	3.50	4.10

Annexe 4: Interview Schedule

Target	Questions
School Heads	● Are there any assistance by parents and teacher association (PTA) or donors in your school ***SBCPD*** ● Do you participate in SBCPD? Why? Why not? ● Do you think SBCPD activities are effective in improving science teacher's ability? ● Do you think SBCPD activities are effective in improving pupil's achievement such as a pass rate of national examination? ● Do all teachers follow the SBCPD cycle? ● Do you think the facilitator has enough ability to lead SBCPD? ● Have you observed any change in attitude or practice in lesson of the teacher who participated in SBCPD activities? ● What are the progressing and hindering factors for SBCPD activities at your school? ***Stakeholder workshop*** ● Is stakeholder workshop useful to improve your ability of school management? In what way was it useful? ● Do you apply school management skills learned in stakeholder workshop? In which way do you apply? ***School Management*** ● What kind of problems or difficulties do teachers in your school have (related to teaching skills)? What is done to solve the problems? ● How do you support teachers when they have difficulties in teaching skills? ● Is your school practicing SBCPD activities, if yes how often? If no, what are the reasons for that? ● Do you evaluate each teacher's performance by using Lesson Assessment Format? ***Parents' Participation*** ● Do you think that parents are eager to support their child's education? ● Are parents eager to support your school?
Facilitators	***SBCPD*** ● Do you think SBCPD activities are effective in improving science teacher's ability? ● Do you think SBCPD activities are effective in improving pupil's achievement such as a pass rate of national examination? ● Do all teachers follow the SBCPD cycle? ● Does your school head support your activities? If yes, how does he/she support? ● Have you observed any change in attitude or practice in lesson of the teacher who participated in SBCPD activities? ● What are the progressing and hindering factors for SBCPD activities at your school? ***Facilitator workshop*** ● Is facilitator workshop useful to improve your ability of school management? In what way was it useful? ● Do you apply facilitation skills learned in stakeholder workshop? In hate way do you apply?
Teachers	***SBCPD*** ● Do you participate in SBCPD? Why? Why not? ● Do you think SBCPD activities are effective in improving your teaching ability? ● Have your attitude or practice in lesson changed after participating SBCPD activities? ● Do you think the facilitator has enough ability to lead SBCPD? ● Do you apply knowledge and teaching skills learned through the SBCPD activities in your lessons? If yes, in which way do you apply? ● Do you think SBCPD activities are effective in improving pupil's achievement such as a pass rate of national examination? ● Have you observed any change in pupil's attitude, interest and achievement in your lessons after starting SBCPD activities? ● What are the progressing and hindering factors for SBCPD activities at your school? ***School Management*** ● Is your performance evaluated by your school head? ● How do you support teachers when they have difficulties in teaching skills? ***Parents' Participation*** ● Do you think that parents are eager to support their child's education? Are parents eager to support your school?

Annexe 5: Questionnaire to School Heads

Impact Survey to School Heads

The Ministry of Education (MOE), with the support of the Japan International Cooperation Agency (JICA), has been conducting "Strengthening of Mathematics, Science & Technology Education – School-Based Continuing Professional Development (SMASTE-SBCPD) Program" (here after the Program). In order to evaluate the impact of the Program, we kindly request you to answer the following questions and provide us with documents relevant to the specific questions. Your contributions will remain anonymous and confidential.

Information on School

District_____

School Name_____

Name of the Head_____

Number of Teachers

Number of teachers Male_____ Female_____

Number of Science teachers Male_____ Female_____

Number of Pupils

Grade 11_____ Grade12_____

Average number of pupils in class_____

Examination

Average score of Mock Examination (Grade12) in July 2010

Total average score_____ Average score in science_____

Completion

Completion Rate for Grade 12 in 2009_____%

External Assistance (please describe their activities if any)

PTA	NGOs Donors	Others

SBCPD Activities (Please check the box)

1. How many SBCPD cycle does your school conduct per term?

☐Non

☐Once per term

☐Twice per term

☐Three times per term

☐More (times per term)

2. About how many percent of teacher (all subjects) in your school participate in the SBCPD activities?

☐0-19%

☐20-39%

☐40-59%

☐60-79%

☐80-100%

Please describe the reasons why some teachers do not participate in the SBCPD.

3. In your school, is there any facilitator for SBCPD activities?

Yes ☐ No☐

If yes, how do you evaluate ability of facilitator during SBCPD activities?

☐Very Poor

☐Poor

☐Fair

☐Very good

☐Excellent

4. How often do you participate in SBCPD activities in your school?

☐Never

☐Seldom

☐Sometimes

☐Often

☐Always

5. Are teachers following SBCPD cycle?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

6. Do teachers spend enough time for preparing their lesson?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

7. Is there any improvement of the teachers' teaching skills in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

8. Is there any improvement of the pupils' achievement in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

9. Do lesson plan activities positively affect on the pass rate of national examination (Grade 12) in science?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

Stakeholder workshop

10. How many times did you participate in Stakeholder workshop per year?

☐No

☐Once per year

☐Twice per year

☐Three times per year

☐More (times per year)

11. Was the stakeholder workshop useful for you to support SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

12. Do you implement new management methods gained during the stakeholder workshop?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

School Management

13. How often do you evaluate each teacher's performance by using the Lesson Assessment Format?

☐Never

☐Seldom

☐Sometimes

☐Often

☐Always

14. How often do you give comment and suggestion for improvement of teaching to the teachers in lesson?

☐Never

☐Seldom

☐Sometimes

☐Often

☐Always

15. Does your school have formulated school action plan after stakeholder workshop?

Yes ☐ No☐

Parents' Participation

16. Are parents eager to support their child's education?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

17. Are parents eager to support your school through PTA?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Monitoring

18. How often is your school monitored by PEST or DEST per term?

☐Non

☐Once per term

☐Twice per term

☐Three times per term

☐More (times per term)

Thank you for your cooperation

Annexe 6: Questionnaire to Facilitators

Facilitator

The Ministry of Education (MOE), with the support of the Japan International Cooperation Agency (JICA), has been conducting "Strengthening of Mathematics, Science & Technology Education – School-Based Continuing Professional Development (SMASTE-SBCPD) Program" (here after the Program). In order to evaluate the impact of the Program, we kindly request you to answer the following questions and provide us with documents relevant to the specific questions. Your contributions will remain anonymous and confidential.

School Name_____

1. What is your main subject you teach in your school? (Please check the box)

☐Physics ☐Chemistry ☐Biology

2. What is your academic qualification?

☐Post Graduate (Ph.D. or Master) ☐Graduate (Bachelor) ☐Advance Diploma

☐Diploma ☐Certificate ☐Other (Specify:)

3. How long have you been teaching?

(Years)

4. Have you participated in training in other countries?

☐Kenya

☐Malaysia

☐Japan

☐Other ( )

SBCPD Activities

5. How often does your school conduct the SBCPD activities?

☐Non

☐Once per term

☐Twice per term

☐Three times per term

☐More (times per term)

6. About how many percent of teacher (all subjects) in your school participate in the SBCPD activities?

☐0-19%

☐20-39%

☐40-59%

☐60-79%

☐80-100%

Please describe the reasons why some teachers do not participate in the SBCPD.

7. Are teachers following SBCPD cycle?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

8. Are other teachers cooperative in conducting SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

9. Does your school head give useful comments and suggestions for improvement of teaching?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

10. Is there any improvement of the teachers' teaching skills in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

11. Is there any improvement of the pupils' achievement in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

12. Do SBCPD activities positively affect on the pass rate of national examination (Grade 12) in science?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

Teaching Methods in Class

13. Do you provide pupils with observation and experiments?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

14. Do you help pupils to apply what you learned at SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

15. Do you write lesson plans for all your lessons?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

16. Can you use adequate teaching materials and text books?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Facilitator workshop

17. How many times did you participate in facilitator workshop per year?

☐No

☐Once per year

☐Twice per year

☐Three times per year

☐More (times per year)

18. Do you still have difficulties to facilitate SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

19. Was facilitator workshop useful for supporting SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

Stakeholder workshop

20. How many times did you participate in Stakeholder workshop per year?

☐No

☐Once per year

☐Twice per year

☐Three times per year

☐More (times per year)

21. Was the stakeholder workshop useful for you to support SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

Parents' Participation

22. Are parents eager to support their child's education?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

23. Are parents are eager to support your school through PTA?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Monitoring

24. How often is your school monitored by PEST or DEST per term?

☐Non

☐Once per term

☐Twice per term

☐Three times per term

☐More (times per term)

Thank you for your cooperation

Annexe 7: Questionnaire to Science Teachers

Impact Survey to Science Teachers

The Ministry of Education (MOE), with the support of the Japan International Cooperation Agency (JICA), has been conducting "Strengthening of Mathematics, Science & Technology Education – School-Based Continuing Professional Development (SMASTE-SBCPD) Program" (here after the Program). In order to evaluate the impact of the Program, we kindly request you to answer the following questions and provide us with documents relevant to the specific questions. Your contributions will remain anonymous and confidential.

School Name_____

1. What is your main subject you teach in your school? (Please check the box)

☐Physics ☐Chemistry ☐Biology

2. What is your academic qualification?

☐Post Graduate (Ph.D. or Master) ☐Graduate (Bachelor) ☐Advance Diploma

☐Diploma ☐Certificate ☐Other (Specify:)

3. How long have you been teaching?

(Years)

SBCPD Activities (Please check the box)

4. Are the SBCPD activities useful for improving your teaching?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

5. How often do you participate in the SBCPD activities?

☐Non

☐Once per term

☐Twice per term

☐Three times per term

☐More (times per term)

6. Are science teachers in your school following SBCPD cycle?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

7. Are other teachers cooperative in conducting SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

8. Does your school head give useful comments and suggestions for improvement of teaching?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

9. Does HOD/HOS give useful comments and suggestions for improvement of teaching?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Teaching Methods in Class

10. Do you provide pupils with observation and experiments?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

11. Do you help pupils to apply what you learned at SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

12. Do you write lesson plans for all your lessons?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

13. Can you use adequate teaching materials and text books?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Pupil Achievement

14. Is there any improvement of the pupils' achievement in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

15. Is there any improvement of the pupils' achievement in science through SBCPD activities?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

16. Do SBCPD activities positively affect on the pass rate of national examination (Grade 12) in science?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Please describe reasons for your answer

Parent' Participation

17. Are you satisfied with the support from pupils' parents?

☐Not at all

☐Little

☐Hard to tell

☐Fairy

☐Very much

Thank you for your cooperation

Annexe 8: Questionnaire to Pupils

Questionnaire to Pupils

Your School Name.....

Your Grade.....

Please check the box that most closely reflects your opinion about your science class (Including biology, physics, and chemistry).

1. Teacher provides pupils with observation and experiments in science class.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

2. Teacher organizes small group discussion session in science class.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

3. Teacher asks pupils to make presentation in front of class in science class.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

4. Teacher organizes questions and answers session in science class.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

5. Teacher uses hand-made teaching materials (such as handouts, experimental tools, etc.) to teach science.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

6. Teachers' explanation on this subject is clear and easy to understand.
   - ☐Strongly Agree
   - ☐Agree
   - ☐Neither Disagree nor Agree
   - ☐Disagree
   - ☐Strongly Disagree

7. Science teacher makes this subject interesting and enjoyable for you.
   - ☐Never
   - ☐Seldom
   - ☐Sometimes
   - ☐Often
   - ☐Always

8. You like experiments and observations in science laboratories on this subject
   - ☐Strongly Agree
   - ☐Agree
   - ☐Neither Disagree nor Agree
   - ☐Disagree
   - ☐Strongly Disagree

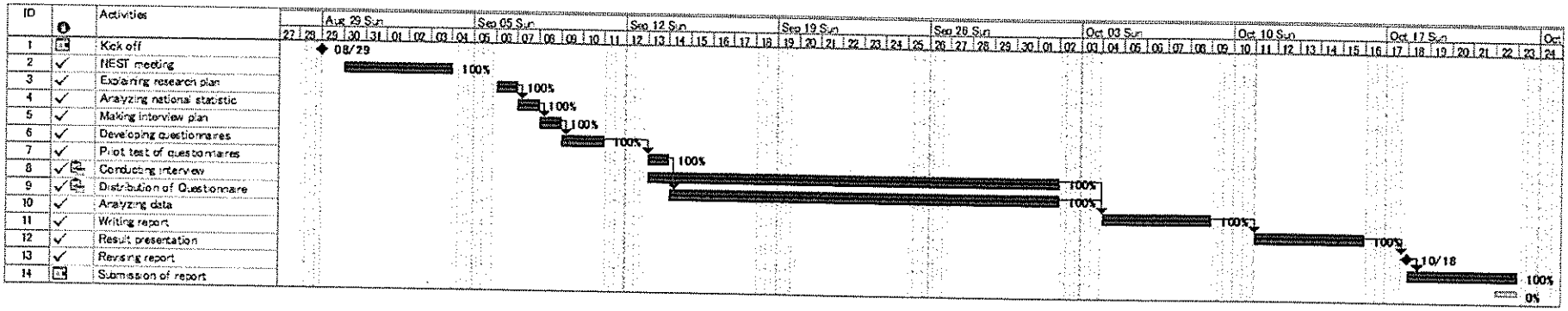
9. Science teacher helps me to get a good grade in this subject.
   - ☐Strongly Agree
   - ☐Agree
   - ☐Neither Disagree nor Agree
   - ☐Disagree
   - ☐Strongly Disagree

10. Your parents help you with your homework in science.
    - ☐Never
    - ☐Seldom
    - ☐Sometimes
    - ☐Often
    - ☐Always

11. Your parents speak with your teacher or principal.
    - ☐Never
    - ☐Seldom
    - ☐Sometimes
    - ☐Often
    - ☐Always

12. You feel your parents are generally satisfied with your school.
    - ☐Strongly Agree
    - ☐Agree
    - ☐Neither Disagree nor Agree
    - ☐Disagree
    - ☐Strongly Disagree

Annexe 9: Period of Assessment

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