

3 . R/D付属M/M (プロジェクト・ドキュメント英文版含む)

**MINUTES OF MEETING
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF MALAWI
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT FOR STRENGTHENING OF MATHEMATICS AND SCIENCE
IN SECONDARY EDUCATION THROUGH IN-SERVICE TRAINING IN MALAWI**


With regard to the Japanese technical cooperation for the Project for Strengthening of Mathematics and Science in Secondary Education through In-service Training in Malawi (hereinafter referred to as "the Project"), the Resident Representative of the Japan International Cooperation Agency (hereinafter referred to as "JICA") held a series of discussions with the Malawian authorities concerned with respect to desirable measures to be taken by JICA and the Malawian Government for the successful implementation of the above-mentioned Project.

As a result of the discussions, both sides agreed to summarize the matters referred to in the document attached hereto as a supplement to the Record of Discussions.

Lilongwe, 30th September, 2004



Mr. Takashi Kato,
Resident Representative,
Malawi Office,
Japan International Cooperation Agency,
Japan



Dr. Simeon A. Hau,
Secretary for Education,
Ministry of Education,
Republic of Malawi

THE ATTACHED DOCUMENT

The discussions between the Malawian authorities concerned such as the Ministry of Education (hereinafter referred to as "MoE") and JICA were held in Lilongwe with the participants listed below:

Malawian Side

Dr. S. A. Hau	Secretary for Education
Mrs. M. G. Kabuye	Director, Department of EMAS, MoE
Mrs. A. M. Chimzimu	Director, Department of Finance and Administration, MoE
Dr. E. W. Chakwera	Deputy Principal, DCE
Mr. M. M. Makalande	Deputy Director, Department of Planning, MoE
Mr. D.P. Senganimalunje	Chief Planning Officer, MoE
Mr. A.D.K.Phiri	Training Officer for Secondary Education, DTED, MoE
Mr. Y. Nakayama	Expert (Education Planning Adviser), Department of Planning, MoE

Japanese Side

Mr. T. Kato	Resident Representative, JICA Malawi Office
Mr. T. Uchiyama	Assistant Resident Representative, JICA Malawi Office
Mr. F. P. Ngwenya	Education Aid Coordinator, JICA Malawi Office



I. PROJECT TITLE

The Project for Strengthening of Mathematics and Science in Secondary Education through In-service Training in Malawi (SMASSE INSET MALAWI)

II. SCOPE OF TECHNICAL COOPERATION

1. The Project will cover the following subjects based on ASEI(Activity, student, Experiment and Improvisation) and PDSI(Plan, Do, See and Improve):

Mathematics

Physical Science

Biology

Home Economics

The project will support Home Economics in the principle of ASEI/PDSI. However, the subject specific technical training will be covered by Malawian side.

Educational Management for secondary schools will also be assisted under the Project.

2. The Project will be stationed at Domasi College of Education (hereinafter referred to as "DCE") for the implementation of technical cooperation and shall cover all the Districts in SEED:

Balaka

Machinga

Mangochi

Zomba Rural

Zomba Urban

Selecting SEED as the target division is justified because of the following reasons:

- Accumulated experience of JICA support based at DCE since 2000
- Maximum utilization of DCE facilities supported by Japanese Grant Aid
- Existence of similar programmes in other divisions (e.g. programme based at Mzuzu University)

3. Contents of Technical Cooperation

Technical cooperation under the Project will cover the following areas for in-service training (hereinafter referred to as "INSET") of mathematics and sciences to the counterpart personnel of DCE and other schools:

- (1) Development of curriculum for INSET
- (2) Subject competency
- (3) Techniques of operation and maintenance of experimental equipment and apparatus
- (4) Development and production of teaching and learning materials
- (5) Teaching methods
- (6) Course management
- (7) Monitoring and evaluation of INSET activities

III. OUTLINE OF THE INSET

1. Levels of INSET

(1) Divisional level

(2) Cluster level (at schools selected as "INSET centres")

2. Training Objectives

(1) Divisional level

To produce Core Trainers with adequate knowledge and skills of teaching Mathematics and Sciences for facilitating INSET at INSET centres in the target Districts.

(2) Cluster level

To enable Mathematics and Science teachers acquire adequate knowledge and skills of teaching mathematics and Sciences through INSET in the target Districts.

3. Target Groups

(1) Divisional level

Trainees are Core Trainers in the target Districts:

DCE lecturers, Senior Education Method Advisors (hereinafter referred to as "SEMAs"), and teachers of Mathematics and Sciences, who are identified by the Project

The selection of trainees will be done by MoE based on the criteria agreed upon between MoE and JICA.

(2) Cluster level

Trainees are Mathematics and Science teachers in the target Districts.

4. Training Period, Frequency, Number of Annual Trainees, Number of INSET centres

(1) Divisional level

Training period: four (4) weeks per year

Frequency: two (2) weeks in August; the rest is staggered throughout the year

Number of trainees: Approximately 40-50 including SEMAs in SEED

(2) Cluster level

Training period: four (4) weeks per year

Frequency: staggered throughout the year

Number of trainees: approximately 300-370

Number of INSET centres in SEED: approximately 3-5

5. Certification Given to the Trainees

Issuing of certificates signed by the Secretary for Education and the Principal of DCE, will be facilitated by the Malawian authorities concerned.

6. Incentives

The possibility of the provision of other incentives to the beneficiaries and staff who contribute to INSET by the Malawian authorities concerned will be considered in accordance with the progress of the Project.

7. Facilities for INSET

The principal facilities which are necessary to implement the Project are as follows:

- (1) DCE (divisional level)
- (2) INSET centres (cluster level)

IV. INPUTS TO THE PROJECT BY THE JAPANESE SIDE

1. Dispatch of Experts

The relevant request forms, namely the A1 forms, to assign Japanese experts for the term of the technical cooperation will be submitted by the Malawian side without delay. With regard to assigning SMASSE-WECSA experts, the relevant request forms, namely the A1-T forms, will be also submitted by the Malawian side without delay.

2. Provision of Equipment

The relevant request form, namely the A4 form, for the provision of equipment for the first year of the technical cooperation will be submitted by the Malawian side after consultation between the Malawian authorities concerned and JICA.

3. Technical Training of Counterpart Personnel in Japan and third countries

The relevant request form, namely the A2A3 form, for technical training in third countries will be submitted by the Malawian side after consultation between the Malawian authorities concerned and JICA.

There may be also opportunities for some counterpart personnel to get long-term training in Japan, in order to acquire advanced knowledge and skills required for sustaining the Project activities. Necessary procedures for this training scheme will be followed by the Malawian side without delay.

V. INPUTS TO THE PROJECT BY THE MALAWIAN SIDE

1. Assignment of Personnel

With reference to Item 6 (1) of Article III of the Record of Discussions, the Malawian side will assign an appropriate number of counterpart personnel as well as administrative personnel. The appointment of counterpart personnel will be done as soon as possible. The administrative personnel will be posted before the commencement of the Project.

The Malawian side will pay adequate attention to the balance between the normal duties of Core Trainers as ordinary teachers and their duties for the Project, and they will take remedial measures such as reducing their teaching load where necessary.

2. With reference to Item 6 (4) and (5) of Article III of the Record of Discussions, the Malawian side requested the Japanese side to consider supporting them because of financial difficulties.

3. Allocation of Budget

(1) With reference to Item 7 of Article III of the Record of Discussions, the Malawian side will allocate

the budget necessary for the implementation of the Project:

- (a) Salaries and other allowances for the Malawian staff
 - (b) Expenses for electricity, water, gas, fuel and other contingencies
 - (c) Operational expenses for customs clearance, storage, domestic transportation and installation of the Project equipment provided by the Japanese side
 - (d) Expenses for maintenance of the Project facilities and equipment
 - (e) Other necessary local expenses of the Project
 - (f) Expenses for organizing INSET (such as food, transport and accommodation)
- (2) With reference to Items (1) (c) and (d) above, the Malawian side will take necessary measures in coordination with the relevant authorities, for the customs entry of the equipment provided by the Government of Japan without delay. MoE will be responsible for the proper documentation and clearance of the delivered equipment at the ports/airports of entry, as well as being responsible for the proper administration of the equipment provided for use and for ensuring appropriate utilisation and maintenance for the implementation of the Project.
- (3) With reference to Item (1) (f) above, the Malawian side requested the Japanese side to consider supporting them because of financial difficulties. As a result of discussions, both sides agreed that it will be provided by the Japanese side at the beginning of the Project based on the ANNEX VI and details on cost sharing will be discussed between Japanese side and Malawian side after the Project starts.

VI. PROJECT DESIGN MATRIX

A Project Design Matrix (hereinafter referred to as "PDM") is usually used for Japanese technical cooperation projects in order to manage and implement the projects efficiently and effectively. It is also used as a reference for monitoring and evaluating the projects.

The PDM shown in ANNEX I will be applied to the Project with the following understanding:

1. PDM is a logically designed matrix which defines the initial understanding of the framework for the Project and indicates the logical steps towards the achievement of the Project Purpose.
2. PDM is to be flexibly developed according to the progress and achievement of the Project, upon agreement between the Malawian and Japanese sides.

VII. TENTATIVE SCHEDULE OF IMPLEMENTATION

The Tentative Schedule of Implementation has been formulated according to the Record of Discussions, on condition that the necessary budget will be allocated for the implementation of the Project by both sides and that the schedule is subject to change within the scope of the Record of Discussions when necessity arises in the course of the Project implementation.

The Tentative Schedule of Implementation is shown in ANNEX II.

VIII. PLAN OF OPERATION

The Plan of Operation has been tentatively formulated according to the Record of Discussions. The Plan of Operation for the whole period is shown in ANNEX III and the Annual Plan of Operation for the first year is shown in ANNEX IV.

The Plan of Operation is to be drafted by the Malawian counterparts and the Japanese expert and is to be submitted to the Joint Coordinating Committee. The activities are subject to change within the scope of the Record of Discussions, if necessity arises in the course of the Project implementation.

IX. ADMINISTRATION OF THE PROJECT

The organization chart of the Project is shown in ANNEX V.

X. RELATION TO THE DISPATCH OF JOCV IN SOUTH EAST EDUCATION DIVISION

In order to implement the Project effectively, it is important to have close relationship between the Project and the dispatch of JOCV in the target Districts. The details of the activities carried out by the JOCV in relation to the Project will be separately agreed upon between the Malawian authorities concerned and JICA Malawi Office.

ANNEX I	PROJECT DESIGN MATRIX
ANNEX II	TENTATIVE SCHEDULE OF IMPLEMENTATION
ANNEX III	PLAN OF OPERATION FOR THE WHOLE PERIOD
ANNEX IV	ANNUAL PLAN OF OPERATION FOR THE FIRST YEAR
ANNEX V	ORGANIZATION CHART OF THE PROJECT
ANNEX VI	TENTATIVE COST SHARING PLAN FOR START-UP ACTIVITIES 2004/05
ANNEX VII	PROJECT DOCUMENT

Project Design Matrix (PDM)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
[Super Goal] The abilities of secondary school students in maths and science is improved in Malawi.			
[Overall Goal] The quality of teaching of maths and science is improved in secondary schools in Malawi.	By 2015, secondary maths/science teachers sampled nationally obtain mean of over 2.5 on the scale of 0 to 4 in the Teaching Quality Index administered by the EMAS of MoE.	Survey results by the EMAS.	The stability of the teaching force is maintained.
[Project Purpose] Quality INSETs for secondary maths and science teachers are provided by Core Trainers in SEED.	(a) Every year, Quality INSET is conducted at over 3 INSET centres in SEED. (b) By the end of the Project, Core Trainers obtain mean of over 3 on the scale of 0 to 4 in the Trainer Capacity Index administered by the Monitoring and Evaluation Team. (c) By the end of the Project, cluster-level INSETs obtain mean of over 2.5 on the scale of 0 to 4 in the INSET Quality Index through Pre- and Post- INSET and Session evaluation instruments administered by the Monitoring and Evaluation Team.	Project Monitoring and Evaluation reports.	INSETs are carried out also in the divisions other than SEED.
[Outputs] 1. Core Trainers for cluster-level INSET are trained. 2. Physical and material environment for INSET is improved. 3. Secondary math/science teachers are trained at cluster-level INSET. 4. Leadership at school, divisional and Ministry level is strengthened in terms of INSET administration.	1. By the end of the Project, over 50 Core Trainers undergo suitable training. 2. By the end of the Project, over 3 INSET centres and other 88 schools are equipped according to the minimum standards set by the Project. 3(a) By the end of the Project, over 4 cluster-level INSET are held at each INSET centre. 3(b) By the end of the Project, over 300 teachers complete the modules for cluster-level INSET. 4. By the end of the Project, over 90 headmasters and over 20 division and Ministry officials participate training sessions for strengthening their administrative capacity.	Project records.	The master plan for DCE, which envisages the establishment of Faculty of Distance and Continuing Education is approved.
[Activities] 1-1 Set the TOR and recruitment criteria for Core Trainers 1-2 Recruit Core Trainers 1-3 Organize induction courses for newly recruited Core Trainers 1-4 Develop curricula for Core Trainers' training	[Inputs] 1. Japanese side: a Dispatch of long-term expert. b Dispatch of short-term experts. c Training of counterpart personnel in Japan, Kenya and other countries.		The numbers of trained Core Trainers and other personnel are maintained.

1-5 Develop INSET manuals for Core Trainers	d Provision of equipment.	
1-6 Train Core Trainers at DCE and other institutions	e Expenses for organizing INSET	
1-7 Assess the achievement of each Core Trainer and provide additional support where necessary		
2-1 Set the designation criteria for INSET centres	2. Malawian side:	
2-2 Designate schools as INSET centers in clusters	a Assignment of counterpart personnel.	
2-3 Conduct the baseline study on the current physical and material environment at schools	b Assignment of administrative personnel.	
2-4 Set the minimum standards for INSET centres and other schools	c Buildings and facilities necessary for the Project.	
2-5 Equip INSET centres and other schools with necessary materials according to the standards	d Allocation of the budget necessary for the Project.	
2-6 Strengthen the function of DCE as a resource centre for INSET		
3-1 Sensitize the teachers on the importance of INSET activities		
3-2 Sensitize the teachers on gender issues in maths/science education.		
3-3 Develop monitoring and evaluation tools for teaching and INSET.		
3-4 Conduct the baseline study on the needs and capacity of teachers in methodology and subject knowledge		
3-5 Develop curricula for cluster-level INSET		
3-6 Develop teaching and learning materials for INSET		
3-7 Conduct INSET at INSET centres in clusters		
3-8 Monitor the teaching by teachers regularly during the term		
3-9 Conduct follow-up activities where necessary		
3-10 Develop a system to facilitate information sharing by teachers		
4-1 Sensitize the headmasters on the importance of INSET activities		
4-2 Organize training sessions for strengthening administrative capacity at school, divisional and Ministry level		
4-3 Publicize INSET activities through newsletters, circulars, websites, e-mails, etc.		
4-4 Hold conferences for maths/science education to publicize the Project activities		
		[Pre-conditions]
		TSC and TUM do not oppose the Project.

ANNEX II

TENTATIVE SCHEDULE OF IMPLEMENTATION

Subject of Activities	2004			2005			2006			2007		
	1	4	7	10	1	4	7	10	1	4	7	10
I. Term of Cooperation												
II. Inputs by the Malawian Side												
1. Building and facilities												
2. Assignment of counterpart personnel												
3. Assignment of administrative personnel												
4. Allocation of budget												
III. Inputs by the Japanese Side												
1. Dispatch of long-term experts												
2. Dispatch of short-term experts												
3. Training of counterpart personnel in Japan, Kenya and other countries												
4. Provision of equipment												
5. Dispatch of consultation/evaluation teams												
IV. Joint Coordinating Committee												
V. Preparation for INSET												
1. Counterpart training at DCE and other institutions												
2. Development & production of materials for INSET												
VI. In-service Training Course												
1. Core Trainers' training at DCE												
2. Cluster-level INSET at selected schools												
VII. Monitoring and Evaluation for INSET												

PLAN OF OPERATION FOR THE WHOLE PERIOD

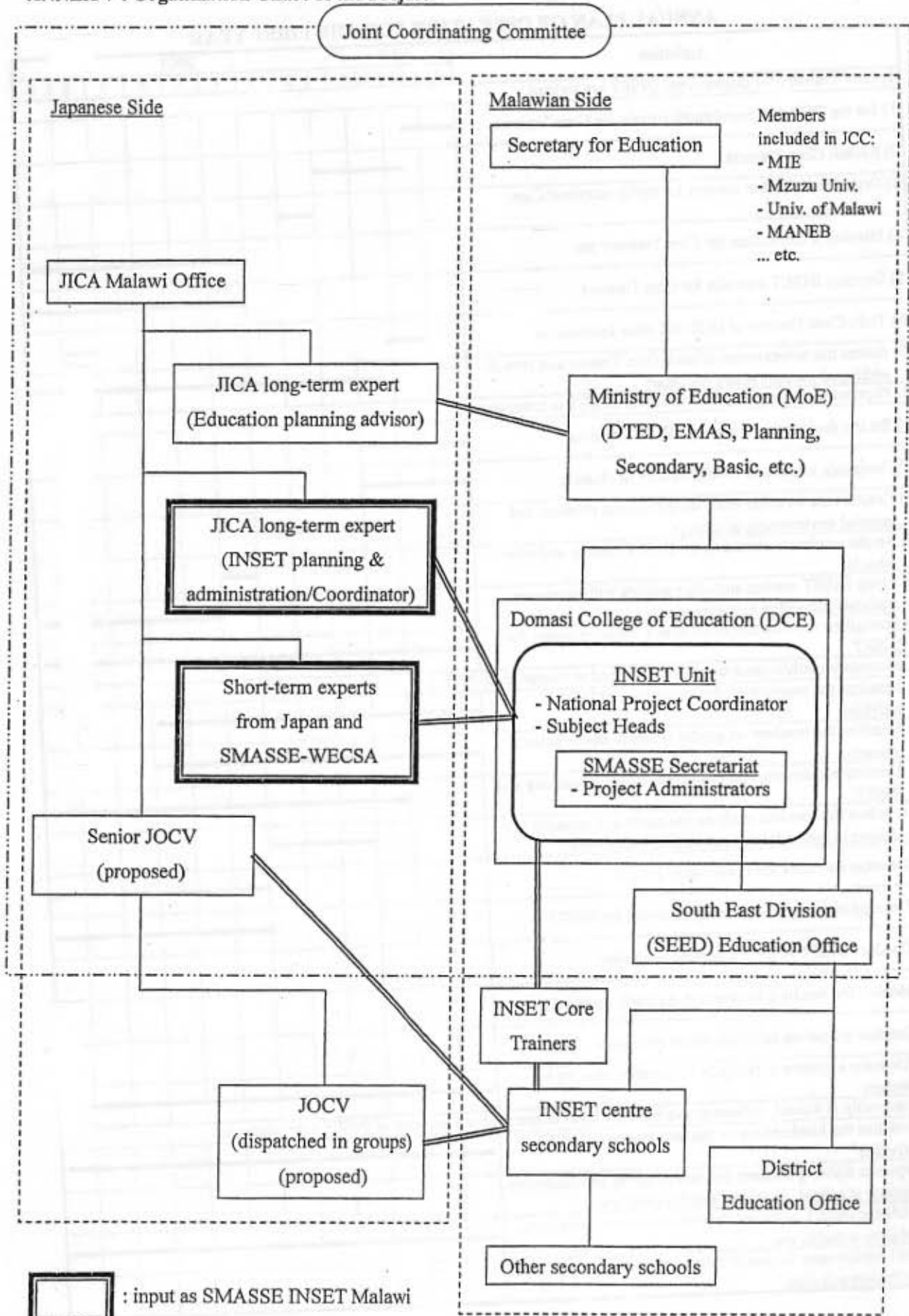
Activities	Target															
	2004			2005			2006			2007						
	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10
1. Core Trainers for cluster-level INSET are trained.																
1) Set the TOR and recruitment criteria for Core Trainers																
2) Recruit Core Trainers																
3) Organize induction courses for newly recruited Core Trainers																
4) Develop a curriculum for Core Trainers' training																
5) Develop INSET manuals for Core Trainers																
6) Train Core Trainers at DCE and other institutions																
7) Assess the achievement of each Core Trainer and provide additional support where necessary																
2. Physical and material environment for INSET is improved.																
1) Set the designation criteria for INSET centres																
2) Designate schools as INSET centres in clusters																
3) Conduct the baseline study on the current physical and material environment at schools																
4) Set the minimum standards for INSET centres and other schools																
5) Equip INSET centres and other schools with necessary materials according to the standards																
6) Strengthen the function of DCE as a resource centre for INSET																

Activities	Target	2004			2005			2006			2007		
		1	4	7	10	1	4	7	10	1	4	7	10
3. Secondary math/science teachers are trained at cluster-level INSET.													
1) Sensitize the teachers on the importance of INSET activities	Over 350 teachers in the target area are sensitized about INSET through participating in sensitization workshops.												
2) Sensitize the teachers on gender issues in maths/science education	Over 350 teachers in the target area are sensitized about gender issues through participating in sensitization workshops.												
3) Develop monitoring and evaluation tools for teaching and INSET.	Appropriate monitoring and evaluation tools for teaching and INSET are developed.												
4) Conduct the baseline study on the needs and capacity of teachers in methodology and subject knowledge	Sufficient data for further activities are collected.												
5) Develop curricula for cluster-level INSET	The curriculum for each subject is produced.												
6) Develop teaching and learning materials for INSET	Adequate materials for over 50 Core Trainers and over 350 teachers are produced.												
7) Conduct INSET at INSET centres in clusters	At least 4 INSETs are conducted.												
8) Monitor the teaching by teachers regularly during the term	91 schools in the target area are monitored at least once after each INSET.												
9) Conduct follow-up activities where necessary	Necessary follow-up activities are carried out based on the monitoring results.												
10) Develop a system to facilitate information sharing by teachers	By the end of the Project, a system for information sharing is developed.												
4. Leadership at school, divisional and Ministry level is strengthened in terms of INSET administration.													
1) Sensitize the headmasters on the importance of INSET activities	91 headmasters in the target area are sensitized about INSET through participating in sensitization workshops.												
2) Organize training sessions for strengthening administrative capacity at school, divisional and Ministry level	At least 2 training sessions are conducted.												
3) Publicize INSET activities through newsletters, circulars, websites, e-mails, etc.	By the end of the Project, SMASSE activities become well known in all the other 5 divisions in Malawi.												
4) Hold conferences for maths/science education to publicize the Project activities	At least one national or regional conference is held.												

ANNUAL PLAN OF OPERATION FOR THE FIRST YEAR

Activities	2004			2005								
	10	11	12	1	2	3	4	5	6	7	8	9
1. Core Trainers for cluster-level INSET are trained.												
1) Set the TOR and recruitment criteria for Core Trainers	█											
2) Recruit Core Trainers		█	█									
3) Organize induction courses for newly recruited Core Trainers				█								
4) Develop a curriculum for Core Trainers' training							█	█	█	█	█	█
5) Develop INSET manuals for Core Trainers							█	█	█	█	█	█
6) Train Core Trainers at DCE and other institutions		█									█	
7) Assess the achievement of each Core Trainer and provide additional support where necessary			█	█	█	█	█	█	█	█	█	█
2. Physical and material environment for INSET is improved.												
1) Set the designation criteria for INSET centres	█	█										
2) Designate schools as INSET centres in clusters	█	█										
3) Conduct the baseline study on the current physical and material environment at schools				█	█	█						
4) Set the minimum standards for INSET centres and other schools							█					
5) Equip INSET centres and other schools with necessary materials according to the standards								█	█	█	█	█
6) Strengthen the function of DCE as a resource centre for INSET												
3. Secondary math/science teachers are trained at cluster-level INSET.												
1) Sensitize the teachers on the importance of INSET activities	█	█	█	█	█	█	█	█	█	█	█	█
2) Sensitize the teachers on gender issues in maths/science education	█	█	█	█	█	█	█	█	█	█	█	█
3) Develop monitoring and evaluation tools for teaching and INSET.			█	█	█	█	█	█	█	█	█	█
4) Conduct the baseline study on the needs and capacity of teachers in methodology and subject knowledge				█	█	█						
5) Develop curricula for cluster-level INSET							█	█	█	█	█	█
6) Develop teaching and learning materials for INSET							█	█	█	█	█	█
7) Conduct INSET at INSET centres in clusters												
8) Monitor the teaching by teachers regularly during the term												
9) Conduct follow-up activities where necessary												
10) Develop a system to facilitate information sharing by teachers	█	█	█	█	█	█	█	█	█	█	█	█
4. Leadership at school, divisional and Ministry level is strengthened in terms of INSET administration.												
1) Sensitize the headmasters on the importance of INSET activities	█	█	█	█	█	█	█	█	█	█	█	█
2) Organize training sessions for strengthening administrative capacity at school, divisional and Ministry level												
3) Publicize INSET activities through newsletters, circulars, websites, e-mails, etc.	█	█	█	█	█	█	█	█	█	█	█	█
4) Hold conferences for maths/science education to publicize the Project activities												

ANNEX V : Organization Chart of the Project



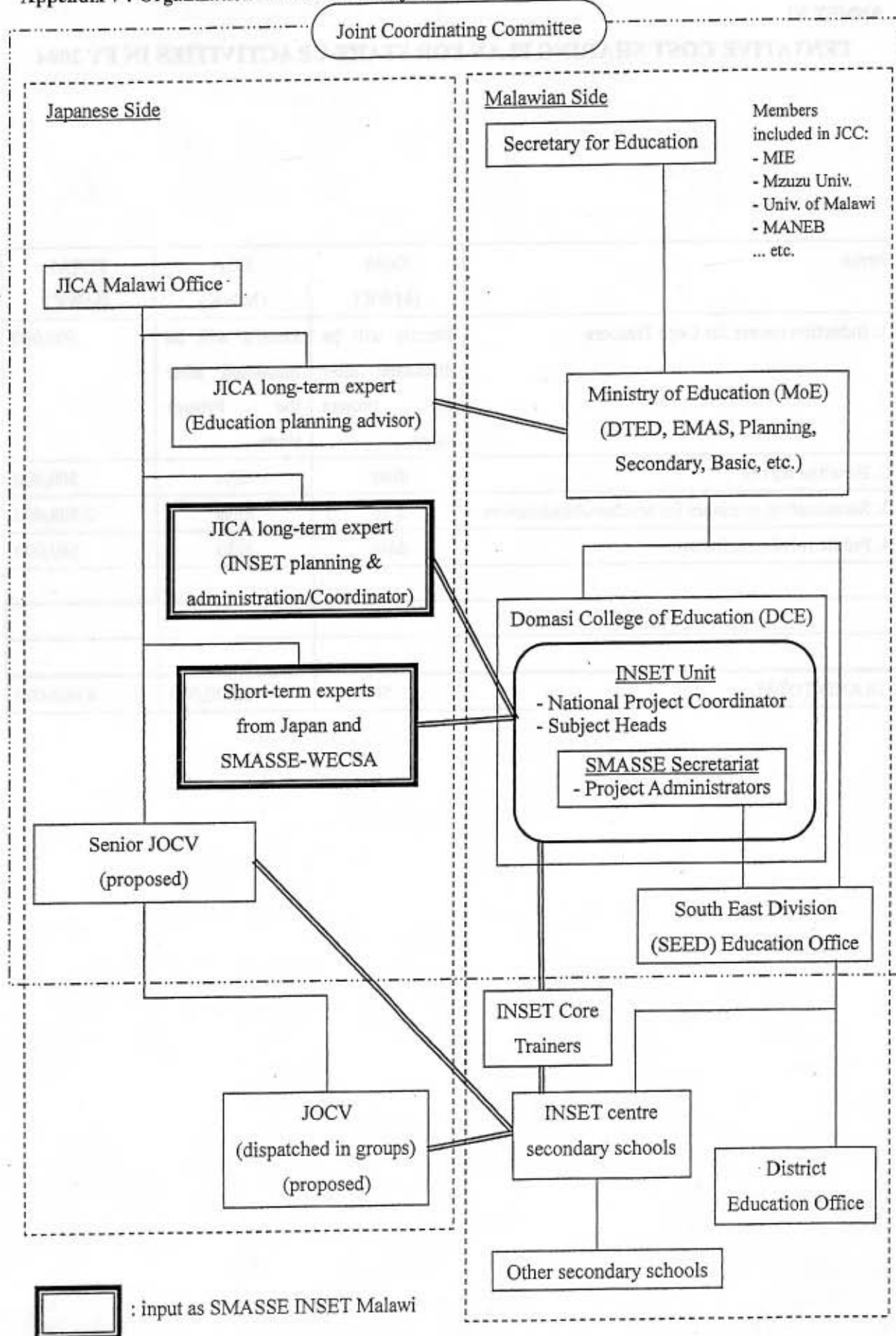
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ANNEX VI

TENTATIVE COST SHARING PLAN FOR START-UP ACTIVITIES IN FY 2004

Items	GoM (MWK)	JICA (MWK)	TOTAL (MWK)
1. Induction course for Core Trainers	Details will be discussed after the Project starts.	Details will be discussed after the Project starts.	500,000
2. Baseline survey	ditto	ditto	500,000
3. Sensitization seminars for teachers/headmasters	ditto	ditto	2,500,000
4. Public relation activities	ditto	ditto	500,000
GRAND TOTAL	500,000	3,500,000	4,000,000

Appendix 7 : Organization Chart of the Project



PROJECT DOCUMENT

THE PROJECT FOR STRENGTHENING OF MATHEMATICS AND SCIENCE IN SECONDARY EDUCATION THROUGH IN-SERVICE TRAINING IN MALAWI (SMASSE INSET MALAWI)

September 2004

Ministry of Education (MoE), Malawi

and

Japan International Cooperation Agency (JICA), Japan



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Appendix 1 Project Design Matrix (PDM)

Appendix 2 Plan of Operation (PO)

Appendix 3 Tentative Schedule of Implementation (TSI)

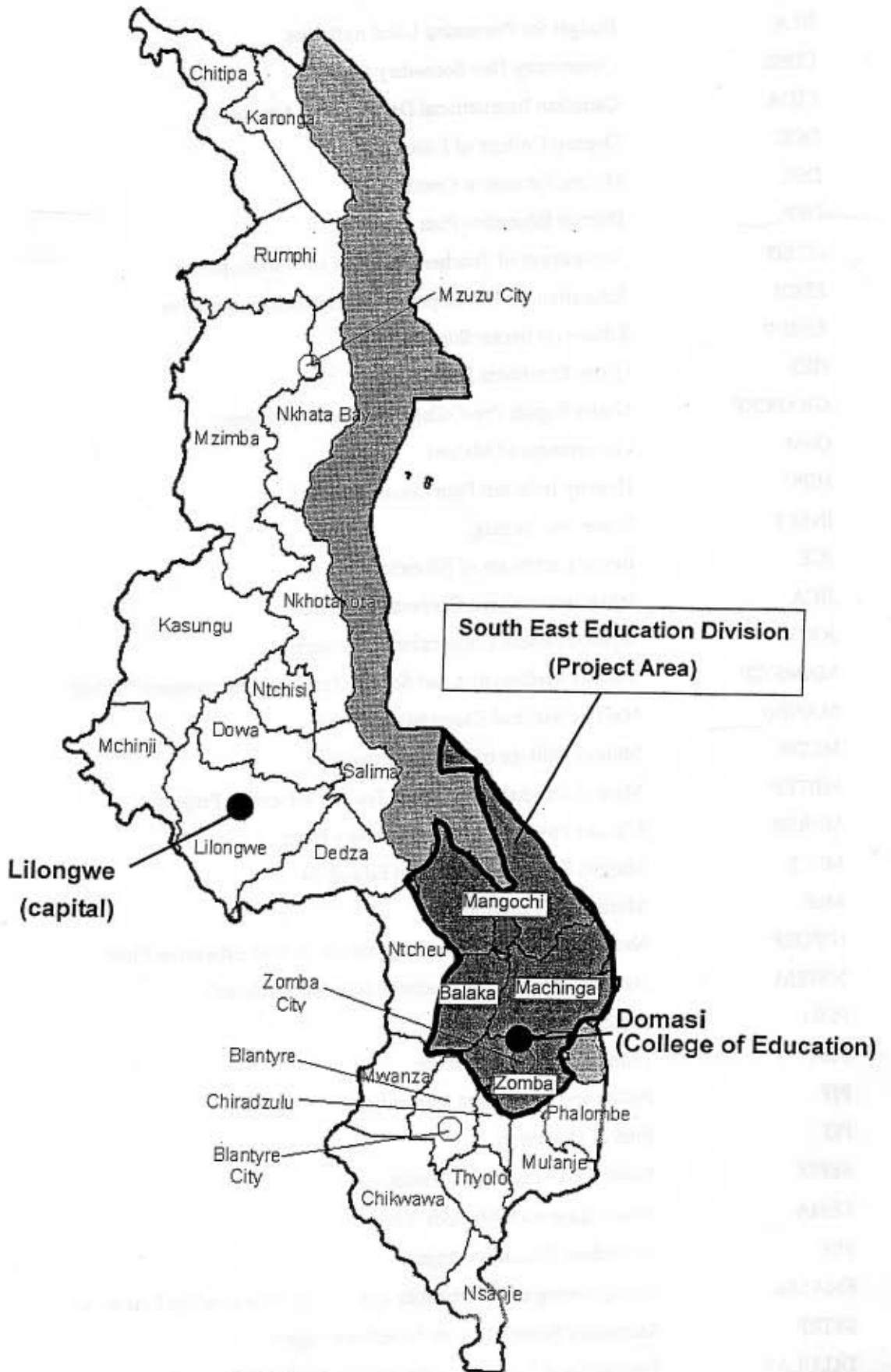
Appendix 4 Terms of Reference for JICA Experts

Appendix 5 Terms of Reference for Malawian Personnel

Appendix 6 List of Major Equipment for the Project

Appendix 7 Organization Chart of the Project

Map of Malawi



Abbreviations and Acronyms

BLA	Budget for Promoting Local Activities
CDSS	Community Day Secondary School
CIDA	Canadian International Development Agency
DCE	Domasi College of Education
DEC	Distant Education Centre
DEP	District Education Plan
DTED	Department of Teacher Education and Development
EDDI	Education for Development and Democracy Initiative
ESSUP	Education Sector Support Project
GER	Gross Enrolment Ratio
GRAPCEP	Grand Rapids Pre-College Engineering Program
GoM	Government of Malawi
HIPC	Heavily Indebted Poor Countries
INSET	In-service training
JCE	Junior Certificate of Education
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
MAMSTIP	Malawi Mathematics and Science Teaching Improvement Project
MANEB	Malawi National Examinations Board
MCDE	Malawi College of Distance Education
MIITEP	Malawi Integrated In-service Teacher Education Project
MPRS	Malawi Poverty Reduction Strategy Paper
MSCE	Malawi School Certificate of Education
MoE	Ministry of Education
NIPDEP	National Implementation Program for District Education Plans
NSTEM	National Strategy for Teacher Education in Malawi
PDM	Project Design Matrix
PEA	Primary Education Advisor
PIF	Policy and Investment Framework
PO	Plan of Operation
SEED	South East Education Division
SEMA	Senior Education Methods Advisor
SEP	Secondary Education Project
SMASSE	Strengthening of Mathematics and Science in Secondary Education
SSTEP	Secondary School Teacher Education Project
TALULAR	Teaching and Learning Using Locally Available Resources

TSI	Tentative Schedule of Implementation
USAID	United States Agency for International Development
WECSA	Western, Eastern, Central and Southern Africa
WG	Working Group

1. Introduction

In Malawi, “low quality of secondary education” has been recognized as one of the challenges in its education sector. It is no less true in teaching of mathematics and science, which is evidenced by the low academic achievement of students. There is a great need for the development of experiment methods using appropriate technology and the improvement in teaching methodology. The Government of Malawi (GoM) has recognized this problem, and it has begun to formulate policies and strategies for teacher education and development for secondary schools. However, comprehensive actions are yet to be materialised.

Similar problems were identified in many other countries in the Region, and it was quite a natural move that JICA got interested in supporting those countries through utilizing experience of its technical cooperation project “Strengthening of Mathematics and Science in Secondary Education (SMASSE)”, which had been implemented in Kenya since 1998, with the aim of strengthening quality of mathematics and science education at secondary level. SMASSE had been widely recognized as a success, and it was crucial to make the most of its experience, for “south-to-south cooperation” which Japan was promoting. SMASSE thus established the regional network called SMASSE-WECSA (Western, Eastern, Central and Southern Africa)¹ in 2002. Malawi, having recognized the effectiveness of the approach taken by SMASSE on its own problems, joined SMASSE-WECSA, and since 2000, it has been seeking for measures to improve mathematics and science education at secondary level through in-service training (INSET), with the cooperation of SMASSE Kenya, through activities such as “participation in national INSET in Kenya”, “participation in regional conferences”, “holding joint workshops with SMASSE-WECSA”, “participation in third-country counterpart training”, “conducting a needs assessment study” and “conducting a trial INSET”.

The necessity of such activities for mathematics and science in secondary education has been recognised, and they are also relevant to the policies and strategies of GoM. However, most of these activities were financed by the Budget for promoting Local Activities (BLA) of a JICA expert (Education Planning Adviser) posted at Ministry of Education (MoE), and the financial and technical inputs were rather limited. It was judged that a *technical cooperation project*, as more comprehensive and systematic efforts, should be implemented, if the achievements to date were to be expanded and more tangible effects of the support for improving mathematics and science education at secondary level through INSET were to be produced. This Project for Strengthening of Mathematics and Science in Secondary Education through In-service Training in Malawi (SMASSE INSET Malawi) was thus requested. Following the request, JICA conducted a preparatory study in order to collect relevant information and to assess the feasibility of the Project.

¹ SMASSE-WECSA is a framework of regional support for secondary mathematics and science education in Africa, and currently there are 18 member countries (Burundi, Egypt, Ghana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe).

The purpose of this Project Document is to clarify the social situation, the national strategy and the current condition of education sector in Malawi, to comprehensively provide stakeholders with the details of the background, the significance, and the relevance of the Project based on the information collected through the preparatory study, and to contribute to the operational management of the Project after its commencement.

2. Background Information

2.1 Socio-economic Context

The Republic of Malawi is a landlocked country situated in southern Africa, about 200 km away from the Indian Ocean, and bordering on Tanzania in the north, Mozambique in the south and the east, and Zambia in the west. The national land is extending north and south (ca. 840 km), and its area is 118,000 km² (one third of that of Japan). One sixth of the whole area (its eastern side) is occupied by Lake Malawi, from which the Great Rift Valley extends southwards to Indian Ocean via Shire River. The altitude greatly varies from 30 m (areas along Shire River) to 3,000 m (Mt. Mulanje). The capital city Lilongwe and other major cities such as Blantyre, Zomba and Mzuzu are all situated on the plateau 800 to 1,000 meters above sea level. It has a savannah climate, with three seasons: dry (September to November), rainy (December to April) and semi-rainy (May to August). The temperature varies according to the altitude, and its average is 22 to 29 °C. The annual rainfall is ca. 1,000 mm, which makes the land suitable for farming. The population is approximately 11 million, who live in three regions (Northern, Central and Southern) and in 34 districts. The Southern Region is the most urbanized and densely populated (more than a half of the population live) and is comparatively more developed than other regions.

Malawi is basically a rural society, as about 84% of the population live in rural areas (2003)². Poverty is widespread and severe; 65% of Malawians live below the poverty line (1998). GINI Index is 50 (1997), which shows high income distribution disparity. Literacy rate for adults (15 years old and above) is 62% (2002), which is steadily improving but still low.

Malawian population is highly dependent on agriculture. 85% of the population are agricultural smallholders and their dependants; farming generates over 90% of export earnings and 35-45% of GDP³. The staple crop is maize, but the country is susceptible to food shortage due to poor harvest. Tobacco is by far Malawi's largest export, accounting for around 60% of merchandise export earnings⁴. Other important exports are sugar and tea. Maize and tobacco are grown throughout the country, whereas sugar and tea is produced mostly in the south. Commercial activity is concentrated in Blantyre in Southern Region.

² *World Development Indicators*, World Bank. Other data are also taken from the same source unless specified.

³ *Malawi Country Profile*, Economist Intelligence Unit, 2004.

⁴ Ditto.

Since the early 1980s Malawi's economic policies have been influenced significantly by the World Bank and the IMF, which have provided financial support for the country's adjustment efforts. Since 1988, Malawi has been implementing sectoral adjustment programmes of the World Bank, and the World Bank and the IMF designated Malawi as one of the Heavily Indebted Poor Countries (HIPC) in December 2000. Macroeconomic stability should be a priority in its economic policy, but the Government budget tends to be bloated, and some donors suspend their funding because of the fiscal slippage.

Malawi's real GDP growth has been highly variable. This is mainly because of the economy's dependence on weather conditions and its effect on agricultural output. There has been little noticeable diversification in the production base. During the 1990s there were two years (1992 and 1994) when GDP declined dramatically as a result of drought, and other years when growth exceeded 10%, reflecting recoveries in the agricultural sector and smallholders' reactions to improved price incentives and market conditions. Between 1996 and 1999 real GDP growth averaged 4.6%, but from 2000 to 2002 it was only 0.6%, reflecting macroeconomic instability and repeated years of drought⁵. With the average population growth rate at around 2% per year, GDP per capita has been falling in recent years. The World Bank estimates that if poverty levels are to fall, economic growth rates in excess of 6% per year must be achieved. At present the economy is falling short of this and such a rate may not be sustainably achieved.

Health condition in the country is not very favourable. Under-five mortality rate is 182 per 1,000 live births (2002), and malnutrition is widespread and nearly 49% of children are stunted (2000). Life expectancy is just 38 years (2002), having fallen recently as a result of AIDS-related deaths. In fact, Malawi is one of the countries where HIV/AIDS is the most severe in Africa, with prevalence among adults aged 15-49 of 14.2% (2003)⁶. The AIDS epidemic has created a rapidly growing group of orphans and foster children, now estimated to number about 500,000 (2003)⁷, which are placing extraordinary demands on some of the poorest households.

2.2 Description of the Sub-sector (Secondary & Teacher Education)

The education system in Malawi consists of 8-year primary education, 4-year secondary education (divided into junior and senior), and 2- to 4-year tertiary education. In 1994, the Government introduced free primary education, leading to a massive increase of primary school pupils (1.9 million in 1994 and 2.9 million in 1995)⁸. As a result, Gross Enrolment Ratios (GERs) of primary, secondary and tertiary education are now 146%, 34% and 1% respectively⁹.

⁵ *Malawi Country Profile*, Economist Intelligence Unit, 2004.

⁶ *Report on the Global AIDS Epidemic*, UNAIDS, 2004.

⁷ Ditto.

⁸ *Education Basic Statistics*, MoE, 2003.

⁹ UNESCO Institute for Statistics for primary and secondary (2001). *World Development Indicators*, World Bank for tertiary (1997).

This trend of expansion also affected secondary education. In 1998, the Government decided to upgrade Distant Education Centres (DEC) for Malawi College of Distance Education (MCDE) into Community Day Secondary Schools (CDSS). As a result, the number of students attending secondary schools apparently increased from 70,000 in 1997 to 240,000 in 1999¹⁰. Similarly, the number of schools increased from 200 to 785 (2003). At present, there are basically seven types of secondary schools: Government Day Secondary, Government Boarding Secondary, Grant-aided, Community Day, DEC, Private, and Open Schools (See Table 1 below). As can be seen, about 60% of the students attend CDSS.

Table 1: Number of students by school type

School Type	Boys	Girls	Total (%)
Government Day	7,875	4,610	12,485 (9.5)
Government Boarding	4,415	2,961	7,376 (5.6)
Grant Aided	2,763	4,145	6,908 (5.3)
CDSS	44,662	31,422	76,084 (58.0)
DEC	123	71	194 (0.1)
Private	14,383	12,633	27,016 (20.6)
Open School	632	405	1,037 (0.8)
Total	74,853	56,247	131,100 (100)

Source: Education Basic Statistics, 2003.

Secondary education offers four-year course (from Form 1 to Form 4). Some attend public schools, while others (about 20%) attend private schools. Generally, the quality of education in the latter is better than that in the former. This may be resulting from the difference in school fees, as some private schools charge as much as 50 times public schools. The socio-economic status has been one of the key determinants in the quality of education one can receive.

Students of secondary schools are supposed to sit for the national examinations at the end of Form 2 (Junior Certificate of Education: JCE) and Form 4 (Malawi School Certificate of Education: MSCE). Both are administered jointly by Malawi National Examinations Board (MANEB) and MoE.

With regard to teachers, at present (2003), the number of teachers in Malawi is 7,076, and the student-teacher ratio is 19:1¹¹. Teacher training for secondary education had been conducted only at Chancellor College of the University of Malawi, but the number of trained teachers had been lagging the demand. In 1993, a training course for secondary teachers was established at Teachers' Training College (a training institution for primary school teachers) at Domasi, and the College was upgraded to "Domasi College of Education (DCE)". 1998 saw opening of another university, Mzuzu University, where secondary teachers' training course was offered.

¹⁰ Same as 7.

¹¹ *Education Basic Statistics*, MoE, 2003.

Table 2 below shows all the institutions for secondary teacher training in Malawi, their intakes and shares. The total number of the intake is 1,035, and the intake of DCE (pre-service and SSTEP¹²) accounts for about 40%. Compared to the situations in the past when there was only University of Malawi as a secondary teachers training institution, it can be said that the supply capacity of new teachers has been greatly enhanced. However, due to the massive inflow of those who have gone through free primary education into secondary schools, the number of students is steadily increasing, and it is estimated that the number of teachers will be always 7,000 short of the required number, if the Government does not take any measures to expand teacher training courses¹³.

Table 2: Institutions for secondary teacher training and their intakes (2000)

Institutions	Intake	Share
DCE (3-year, full-time)	180	17.4
DCE (3-year, distance – SSTEP)	270	26.1
Chancellor College, University of Malawi (4-year, full-time)	150	14.5
Chancellor College, University of Malawi (4-year, part-time)	100	9.7
Mzuzu University (4-year, full-time)	50	4.8
Mzuzu University (3-year, distance)	100	9.7
Polytechnic, University of Malawi (4-year, full-time)	20	1.9
Polytechnic, University of Malawi (4-year, part-time)	100	9.7
Bunda College, University of Malawi (4-year, full-time)	50	4.8
African Bible College (4-year, full-time)	15	1.4
Total	1,035	100.0

2.3 National Education Policy and Strategy for Teacher Education and Development

GoM gives poverty reduction high priority, and both in “Vision 2020” (formulated in 1997) and “Malawi Poverty Reduction Strategy Paper (MPRSP)” (formulated in April 2002), it pledges to tackle social development mainly in education and health in order to reduce poverty. In particular, GoM gives increasing access to education the highest priority in MPRSP, and is actively tackling the issue as one of its national goals. In this policy, “unequal educational access” and “inadequate provision of quality educational services” are identified as problems in secondary education, and the latter is attributed to lack of appropriate teachers and teaching/learning materials. GoM formulated a master plan in education sector, “Policy and Investment Framework (PIF)” in 2002, in which it takes up qualitative improvement in secondary education as one of the important issues. PIF states that it is essential to train qualified teachers with professional knowledge as secondary school teachers, who can adequately teach the contents of new curriculum revised in 2000, and also to raise the ratio of female secondary school teachers in order to increase the enrolment rate for girls. Currently, GoM is finalizing “The National Strategy for Teacher Education in Malawi (NSTEM)” for 2002-2012, in which “the development and delivery of INSET programs on a school cluster basis” are clearly envisaged.

¹² Secondary School Teacher Education Project. See Section 2.4 (1) below.

¹³ Nakayama, *Pilot Project for establishing a system of SMASSE INSET MALAWI: Positions and Possibilities*, 2002.

2.4 Prior and On-going Project / Assistance in the Sub-sector

(1) Canadian International Development Agency (CIDA)

CIDA has been supporting secondary sub-sector through "Secondary School Teacher Education Project (SSTEP)" since 2000. SSTEP is based at DCE, and incorporates 3-year distance training courses for teachers at secondary level. At present, there are three cohorts of teacher learners, each cohort consisting of about 300. The purpose of SSTEP is "to strengthen the management and delivery of education in CDSSs through the upgrading of skills and knowledge of teacher learners" and "to increase awareness of gender and HIV/AIDS issues in the schools". After the 3-year course, the teacher learners, who are CDSS teachers certified to teach only in primary schools, will receive diplomas to teach in secondary schools. 150 modules are prepared for the course. Main focus is to provide for more subject knowledge (rather than methodological tips), but there are additional elements such as "HIV/AIDS", "gender", and "Teaching And Learning Using Locally Available Resources (TALULAR)".

During SSTEP course, teacher learners basically keep on teaching their students as usual, while they study provided materials on their own. On weekends, they meet with nearby learners and organize "study circles", which are devised to address a weakness of distance education, "learner loneliness" for their sustainable learning. They participate in "schooling" for 8 weeks in a year, whereby they learn "on-campus" at DCE. The curriculum and teaching/learning materials are developed with the cooperation of lecturers at Chancellor College of University of Malawi, Brandon University and Western Ontario University in Canada. A project manager and two subject-specific experts are dispatched from Canada in the long term, and one member of staff at Faculty of Science of DCE is also employed by the project on a full-time basis.

CIDA is providing financing of US\$ 3.7 million for the project. At the moment, CIDA is covering most of the project costs such as the cost for developing materials, equipment, and allowances for DCE staff. Malawian side covers salaries of teacher learners (as they are ordinary secondary school teachers) and the transport costs for teacher learners when they come to schooling at DCE. However, there are some progress with regard to cost sharing. While CIDA was covering 100% of the cost when SSTEP started in 2000, DCE covered the cost for all the tutors for schooling last year. This year (2004), the budget of DCE for distance education is 6 ~ 7 times that of last year, although it is not certain if this budget will be actually disbursed.

The current phase of SSTEP is supposed to finish in December 2005, and now attempts have been made to assess the success of the project. Basically their training course has been very popular among CDSS teachers, as there is a lot of competition for entering the course (over 3,000 applicants for 300 places). In April 2004, impact of SSTEP was assessed through headmaster questionnaire, JCE and MSCE results, DCE statistics, Division Manager questionnaire, interviews with headmasters and teacher learners, and so on, and it was concluded that there was a noticeable impact on teaching and learning by the project.

Following the demands by teachers and the positive results of the project, it is expected that there will be another phase of SSTEP after the current phase ends. The contents of the second phase is still unclear, but there will be more effort to make the project sustainable through cost sharing with the Malawian side.

(2) Netherlands Government

Netherlands Government was supporting "Malawi Mathematics and Science Teaching Improvement Project (MAMSTIP)" from 1990 to 1998. The goal of MAMSTIP was to improve the quality of teaching of mathematics and science in secondary schools in Malawi, and its purpose was to strengthen and expand the capabilities and activities of Chancellor College in the field of in-service training of mathematics and science teachers. It was implemented jointly by Chancellor College and Free University of Amsterdam. Main outputs were as follows:

- A programme for in-service training of mathematics and science teachers at Chancellor College is established;
- The teaching skills of up to 120 secondary school mathematics and science teachers (especially teachers for Form 3 and 4) are enriched with respect to subject content and awareness of learning difficulties and misconceptions;
- A more pupil-centred, creative and resourceful approach to teaching is applied by a large body of secondary school teachers;
- Availability of equipment and teaching materials in secondary schools of course participants necessary for teaching MSCE syllabus is improved;
- Counterpart Malawian lecturers are trained in the field of in-service training of secondary mathematics and science teachers.

The funding by Netherlands Government was US\$ 1.7 million¹⁴, and a project coordinator and subject-based educators were deployed from the Netherlands, with the support for running costs, school equipment and materials, project vehicle, and course materials.

Although it is hard to assess the achievements by the project in a comprehensive manner, it is possible to highlight some of the characteristics of the project using available information. Firstly, as the project was implemented before the massive expansion of secondary schools by upgrading DEC to CDSS in 1998, the target group was rather small (120 teachers for the whole country). Secondly, INSET was conducted only once a year for 4 to 6 weeks, and there were not sufficient monitoring activities after the INSET¹⁵. Thirdly, neither collaboration with Chancellor College nor their ownership were sufficient and the project failed to win the full support by the College, although some attempts to involve the College were made. Finally, it can be observed that the project failed to attain tangible results in institutionalisation, and after

¹⁴ Only for phase 1 (up to 1994).

¹⁵ At first, there were school visits where teacher learners were visited by the project coordinator. This activity was discontinued after being assessed not effective.

the support by the Netherlands ended in 1998, the project died “a natural death”, according to one observer. Though one can still encounter some teachers who went through the MAMSTIP course, the effects of the project seem to have been dissolved.

(3) United States Agency for International Development (USAID)

Last year (2003), USAID funded a program named “Hands-on Activities for Secondary Science and Mathematics in Malawi”, which was implemented jointly by Mzuzu University and Davenport University in the United States, as part of the Education for Development and Democracy Initiative (EDDI). The purpose of this program was to improve the teaching of science and mathematics in Malawian secondary schools by developing and implementing hands-on, interactive teaching methodologies that use readily available, inexpensive materials and that are appropriate for Malawian secondary schools. Davenport University had an experience of Grand Rapids Pre-College Engineering Program (GRAPCEP), the program with the similar purposes for teachers in Grand Rapids area in US. In 2003, under the program, methodologies were developed based on the results of “needs assessment”; the lecturers of Mzuzu University were trained as workshop facilitators; a 3-day workshop on hands-on activities was conducted for 90 teachers from secondary schools close to Mzuzu; and the results were assessed.

According to their Final Report, the responses of the teachers towards the workshop were quite positive and the booklet containing the hands-on activities they have developed became very popular among teachers. However, this assessment may be received with caution because of the following reasons. Firstly, after one workshop was conducted, the program lost the funding source (no longer funded by USAID). The activities were one-off rather than long-term, and it may be necessary to resume their activities as soon as possible, if any tangible impacts are to be seen. It is unclear when (or if) they find financial sources. Secondly, although it was claimed that “needs assessment” was conducted, it was quite brief, with only 5 schools visited and several teachers interviewed. It may be hard not to feel that this program was simply a “spin-off” of the program conducted in the US. Thirdly, since a rigorous monitoring and evaluation was not included within the scope of the program, it may be hard to have the effects of the workshop take root, sustained and produce an impact. Finally, the way the program motivated teachers – giving allowances only when they finished their assignment – seems to be neither the right approach nor sustainable.

With the problems mentioned above, the program may remain obscure for some time and not influence the course of SMASSE INSET Malawi in a significant way. However, as both of the projects share the same goal, improving the teaching of mathematics and science in Malawi, one cannot ignore the other. It may be necessary to keep in touch with one another.

(4) World Bank

The World Bank was funding “Secondary Education Project (SEP)” from 1998 to 2003, with the objective of increasing the number of students from disadvantaged groups who successfully graduate from public

schools, through producing the following outputs:

1. Access to secondary education especially for girls in rural areas is expanded, through constructing of 20 new day secondary schools and related facilities;
2. Education quality is improved, through provision of teaching and learning materials in all Government and grant-aided conventional secondary schools;
3. The efficiency and effectiveness of the secondary education system at school level is improved, through training of methods advisors, deputy heads and Heads of Department and new Head Teachers in all conventional secondary schools;
4. The spread of HIV/AIDS among teachers and students is stemmed, through development and distribution of HIV/AIDS teaching and learning materials for Forms 1 to 4.
5. Project implementation capacity is strengthened, through technical assistance in procurement and financial management, studies on private education and monitoring & evaluation function for the project.

SEP was in a massive scale (US\$ 48.2 million), and its tangible results can be seen in many places, such as beautifully-built, brand-new conventional day secondary schools. However, it has been observed that even with physical facilities well developed, education provided for students without proper human resource development is less meaningful (Some newly-built schools are under-utilized because of lack of teachers).

Having that observation in mind, the Bank is now planning a new project, "Education Sector Support Project (ESSUP)", which will be implemented from 2005 to 2009 with the funding of US\$ 43.9 million. Since the Bank strongly believes that significant improvement comes only through "holistic" approach, ESSUP consists of many components such as building a new Teacher Training College for primary school teachers, rehabilitating facilities for teacher training courses in universities, facilitating distance education courses for secondary school teachers at Chancellor College, training university lecturers, providing equipment, rehabilitating facilities in CDSS (e.g. teacher residence), and distributing science kits to secondary schools. The impact of this massive project remains to be seen in the future.

(5) JICA

Last but not the least, JICA has been also supporting secondary education in Malawi since almost 40 years ago, through dispatching Japan Overseas Cooperation Volunteers (JOCVs) to secondary schools as mathematics and/or science teachers. There is no denying that these JOCVs contributed to the development of secondary education in Malawi, but the mode of cooperation and also the inputs had been limited until recently.

Since 1999, a long-term expert has been posted at Department of Planning, MoE, with the aim of developing the capacity of MoE staff in the field of educational planning and administration. From 2000

to 2002, JICA was supporting a development study, "School Mapping and Micro Planning", with the aim of developing the capacity of district staff in planning based on the needs at grassroots level. As a result, District Education Plans (DEPs) of all the 33 districts were developed. Since 2003, its successor development study, "National Implementation Program for District Education Plans (NIPDEP)" has been implemented, with the aim of strengthening the capacity of districts in implementing the developed DEPs. Some of the components of DEPs have been implemented as pilot projects in selected 6 districts (Nkhata Bay, Ntchisi, Mchinji, Machinga, Thyolo and Nsanje), while the DEPs of all the districts are being updated. Although formal evaluation not yet conducted, there are some anecdotal evidences that the capacity of districts is being strengthened through strenuous but successful implementation of pilot projects. Now JICA is considering a follow-up project for NIPDEP, with the intention of sustaining and enhancing the achievements of NIPDEP. Details of the successor project are yet to be decided.

JICA is also supporting Grant Aid Project for enhancing the capacity of DCE through constructing a demonstration secondary school, staff residence, hostels for female students, a computer room, and a gymnasium. The construction is to start in October 2004, and finish in October 2005. The demonstration secondary school is planned to open in January 2006, which will be also utilized for the effective implementation of SMASSE INSET Malawi, as a core INSET centre.

While components other than JOCV dispatch have become more prominent, JOCVs continue to play an important role in secondary mathematics and science education. With the commencement of SMASSE INSET Malawi, there will be more representation of JOCV teachers in the Project area than other areas, though some will still be posted in other areas due to equity consideration. Although those who are posted in the Project area may not be formally part of the Project inputs, they are expected to participate in the Project activities collaboratively for enhancing the effects by the Project.

3. Problem to be Addressed and the Current Situation

In Malawi, poor abilities of students in mathematics and science have been recognized. In MSCE, one of the indicators for achievement levels of students, many students fail because of their poor results in mathematics and science subjects, as shown in Table 3 below. It can be observed that their MSCE pass rates in science subjects (especially in mathematics) are low.

Table 3: Pass rates of MSCE candidates in science subjects

Year	% Pass Rate		
	Mathematics	Biology	Physical Science
1995	37.9	27.0	57.9
1996	45.2	45.2	48.6
1997	36.1	28.4	49.6
1998	16.9	22.3	31.5
1999	15.8	26.8	51.2
2000	16.2	30.8	58.0

Source: Country paper on Regional Conference on Mathematics and Science Education at Secondary School level

Their low performance in science subjects also affects their overall results of MSCE, in which the pass rates have been low (20% in 2000). In addition, in the achievement test in mathematics and science administered by JOCV maths/science teachers, targeting over 2,000 students (Form 1 and Form 3) at 19 secondary schools, the average mark was very low (below 30%).

One of the causes of poor student abilities is a great shortage of qualified teachers. According to Educational Basic Statistics in 2003, 30.5% (2,158) out of 7,076 teachers teaching at secondary schools are qualified as secondary school teachers. Especially, in CDSS, where about 60% of the whole secondary school students attend, only 9.1% of the teachers are qualified. Although this figure is for all the subjects, it is certainly true for mathematics and science teachers as well.

However, the problem of teachers is not limited to “lack of qualifications”. Generally in Malawi, it is observed that mathematics and science teachers in secondary schools predominantly adopt lecture methods called “chalk and talk”. Their teaching methods are not varied, and experiments are not actively conducted because teachers believe equipment and chemicals are lacking. As teaching methodology is not extensively pursued even at pre-service training, this problem of inappropriate methodology is pertinent not only to under-qualified teachers at CDSSs but also to qualified teachers at conventional secondary schools.

Also, reasons other than teachers are thought to be contributing to students’ poor abilities. Lack of teaching and learning materials, and facilities is observed widely, especially at CDSSs. For example, on average, 3 Form 4 students share one mathematics textbook at CDSSs. It is not surprising to find a CDSS without any textbooks, and it is very rare to see a CDSS with adequate laboratories. Another factor is poor background of students, resulting from poor quality teaching at primary schools. Some argue that it is difficult, if not impossible, to make up for the loss made during primary schools. Poor quality primary education also affects the attitude of students. Many of them are made to believe that mathematics and science are “difficult” subjects by nature and that they have little to do with such subjects.

4. Project Strategy

4.1 Project Strategy

(1) INSET as an approach

“Poor abilities of students” has been identified as above as one of the pressing issues in mathematics and science education at secondary level in Malawi. There are several approaches to address this problem.

The following may be the major ones:

1. Improving teachers’ teaching through INSET
2. Strengthening pre-service training
3. Providing schools with teaching and learning materials

4. Improving school facilities (laboratories, etc.)
5. Developing appropriate curricula
6. Improving teaching at primary level
7. Formulating relevant policies
8. Revitalising subject associations

Among these approaches, the first approach, “improving teachers’ teaching through INSET” has been selected for SMASSE INSET Malawi, because of the following reasons. Firstly, the first approach may be more feasible than other approaches such as 5 and 6. Its feasibility has been shown in JICA’s past project (SMASSE Kenya), and being a project implemented in a limited area, changing curricula is not possible. Though very important, addressing the issues in primary education may be an immense task. Secondly, the first approach may produce more impact than other approaches such as 2, 3, 4, 7 and 8. It can be argued that teachers’ teaching may be more influential to students’ learning than other elements of education such as teaching and learning materials or facilities, and that targeting in-service teachers may bring about more impact on students than targeting trainee teachers. Thirdly, the first approach may have more immediate effect than other approaches such as 2, 6, 7 and 8, since poor teaching by secondary school teachers may be more direct cause to the students’ problem. Finally, the first approach may be more cost-effective than other approaches such as 3, 4 and 6. Training teachers may be less costly than building laboratories, but it may be more effective in improving students’ learning. With the reasons mentioned above, selecting INSET as an approach can be justified.

(2) Selecting a target area

After an approach is selected, where that approach is utilized, or where the project is implemented, should be decided. From the viewpoint of equity, implementing it nationwide might be the best option, as the benefit of the project could be shared equally throughout the country. However, it may not be feasible to implement it all over Malawi from the beginning, because nobody has yet to know what system and mechanism can work, and it is risky to start in a large scale, and also there is a limitation of resources in both Japanese and Malawian sides (e.g. lack of counterpart personnel). As far as this Project is concerned, it may be better to start in a rather small scale, i.e. in one division.

Through the process of selecting one division out of six divisions, South East Education Division (SEED) has come out as a potential target division, due to the following reasons. Firstly, JICA has been supporting activities related to INSET in the area surrounding DCE (mainly Zomba district) since 2000, and it may be more natural to expand the project over SEED rather than starting it in an entirely new area. Secondly, the capacity of DCE is now being strengthened with the support of JICA’s grant aid project, and from the viewpoint of maximizing the effect of that project, it may be more desirable to set DCE as the core of the Project and implement it in the division where DCE is situated. Finally, as mentioned in 2.4 (3) above, Mzuzu University is planning to implement a similar project in North Education Division, and in order to avoid a collision, it may be better not to implement the Project in the area too close to their target

area. The stakeholders have been consulted, and accepted these reasons. SEED has been thus selected as the target area for the Project.

(3) Operation of INSET

Selecting INSET as an approach for the Project is one thing, deciding *how* to operate the INSET is another. There are a number of modes for INSET operation. When efficiency is put first, it is obvious that conducting INSET at one venue (DCE) for all the teachers is the best. However, considering the limited capacity of DCE, this option may not be desirable. The schedule of DCE has been already packed with many activities, and there is little room for new activities such as INSET to come in. It may be more feasible to set the lower level, which is closer to the classrooms, as the base for INSET. In past, attempts were made to establish a "cluster system" whereby several secondary schools were bundled together to form a cluster and activities such as training workshops were encouraged at cluster level. This was supported by the Danish aid agency, DANIDA, but after they withdrew from the country in 2002, clusters became inactive. As this cluster system has been already devised, it may be a waste not to utilise it as a platform for INSET. Several venues for INSET can be selected among the cluster leader schools as INSET centres, where teachers in that cluster(s) participate in INSET during school holidays. Since school facilities are generally not used during holidays, schools may be suitable venues for INSET.

While the venue is one of the requirements for INSET operation, human resources are also important factors. It should be determined *who* are going to train teachers. The lecturers at DCE, who are usually engaged in teacher training, are the first candidates, and in fact many of those who belong to its Faculty of Science have already some experience as Core Trainers for SMASSE activities. However, they do not necessarily possess all the knowledge and skills required for INSET in general and the teaching methodologies which SMASSE INSET Malawi is planning to promote in particular. Further upgrading of DCE lecturers as SMASSE Core Trainers is required. As already explained, there is little room for relying heavily on DCE as the activity base, so any possible opportunities (e.g. third-country training) should be pursued for the training of Core Trainers. In addition, as the DCE lecturers only cannot cover the required number of Core Trainers, secondary school teachers with relevant knowledge and experience should be also mobilised. They will form important cadres of people who usually stay on the ground and who are made readily available for other less-skilled teachers who need day-to-day support.

It may be difficult to change teachers' teaching only by conducting a single INSET session. Those who participate in INSET should be regularly monitored for their achievements and problems, and follow-up support should be made available where necessary. More effective and efficient mechanism of monitoring and evaluation should be developed, as the current supervision by Senior Education Methods Advisors (SEMAs) is not sufficient.

(4) Coordination with other activities by JICA and other donors

The Project should be always considered in a wider context of support for secondary education in Malawi. It makes more sense to coordinate with other related activities supported by JICA and other donors. As mentioned in 2.4 (6) above, JICA is currently engaged in NIPDEP and JOCV dispatch. NIPDEP is to finish in February 2005, and its successor project is planned to involve INSET-related activities. While that project may target more on management side, SMASSE may deal with the contents of INSET, by dispatching Core Trainers to the workshops, for instance. In this way, two projects can play a complementary role. With regard to JOCV, their suitable roles in the Project should be rigorously pursued, based on the past experiences. There can be little doubt that JOCV can contribute to the Project, which involves many school-level activities, but the experiences of the past JICA projects show that it may be risky to count too much on them. It may be more desirable to form a relationship between the Project and JOCV which brings about mutual benefit.

Among the activities by other donors, the most relevant may be SSTEP of CIDA, as it deals with teacher training at secondary level and also it is based at DCE. Since SSTEP basically conforms to the conventional pre-service training, its primary concern is to provide more knowledge (*what* to teach) rather than methodology (*how* to teach). On the other hand, SMASSE Kenya, whose brainchild is SMASSE INSET Malawi, focuses on the latter. SSTEP and SMASSE can coexist comfortably, if SMASSE addresses the areas where the weaknesses of SSTEP are found. Concrete details of collaboration are yet to be determined, but suggestions have already been made, such as organizing SMASSE workshops for those who come from all over Malawi to DCE for their SSTEP residential courses. This activity may be also desirable with regard to disseminating the effect of the Project to other divisions and leading to institutionalisation. Close relationship should be kept for the two projects, and attempts should be made to materialise the plans for coordination.

4.2 Implementation Arrangement

(1) Counterpart organisation

The organisation chart for the Project is shown in Annex 7. The key organisations are:

- Department of Teacher Education and Development (DTED), MoE
- SEED Office
- DCE
- Schools designated as INSET centres

DTED is a department of MoE in charge of teacher training, and their INSET Training Officer will be designated as counterpart personnel. DTED will also provide one officer as the Desk Officer for the Project, who deals with administrative issues. As the Project site is not close to the MoE headquarters and also DTED still leaves room for improvement in its institutional capacity, the extent of their actual involvement in the Project's daily activities remains to be seen. However, it is imperative to ensure the maximum involvement of the MoE headquarters in the Project process, as their understanding and support

is necessary for the institutionalisation of the Project activities.

The cooperation of SEED Office is also very important. Under decentralisation, the mandate for secondary schools is now basically delegated to them, and they are the ones who control everything related to secondary education in the division. Without their support, the Project cannot be implemented smoothly, and also the effect gained by the Project cannot become sustainable. Division Education Manager and SEMAs are expected to be part of the counterparts. SEED will also provide one officer for the Project secretariat as administrative staff.

Most of all, DCE forms the major counterpart institution. The secretariat will be created at DCE, and the Working Group (WG), which runs the Project on behalf of MoE, will be based there. Principal and Deputy Principal of DCE oversee the Project activities, while the technical issues will be dealt with by subject administrators (heads of Departments). DCE lecturers will also be the target of technical cooperation, as they form the major part of Core Trainers. DCE will also provide one of the two officers posted at the secretariat.

(2) Budget allocation

Since there is currently no institutionalised INSET programme for secondary school teachers in Malawi, the budget for INSET at secondary level is minimal. For example, SEED's budget for INSET was only K 19,000 (ca. US\$ 190) in 2003/04. Although SEED hope that more budget for INSET will be allocated this year, it is not realistic to expect the massive increment so that cost sharing on a significant scale becomes possible. From the viewpoint of future institutionalisation, it is important to pursue ways to secure a source of funds, but the severe financial difficulties in Malawi do not leave room for such consideration. Therefore, the Project will first concentrate on succeeding and exposing the effect, through full financial support, and as the positive effect emerge in a way presentable to MoE, both sides will discuss how this effect could be sustained, through financial commitment by Malawian side. The discussion on the shares of the expenses to be provided by two sides will be held annually.

5. Project Design

5.1 Project Purpose

Quality INSETs for secondary mathematics and science teachers are provided by Core Trainers in SEED.

5.2 Overall Goal

The quality of teaching of mathematics and science is improved in secondary schools in Malawi.

5.3 Outputs and Activities

1. Core Trainers for cluster-level INSET are trained.

1-1 Set the TOR and recruitment criteria for Core Trainers

- 1-2 Recruit Core Trainers
- 1-3 Organize induction courses for newly recruited Core Trainers
- 1-4 Develop curricula for Core Trainers' training
- 1-5 Develop INSET manuals for Core Trainers
- 1-6 Train Core Trainers at DCE and other institutions
- 1-7 Assess the achievement of each Core Trainer and provide additional support where necessary

2. Physical and material environment for INSET is improved.
 - 2-1 Set the designation criteria for INSET centres
 - 2-2 Designate schools as INSET centers in clusters
 - 2-3 Conduct the baseline study on the current physical and material environment at schools
 - 2-4 Set the minimum standards for INSET centres and other schools
 - 2-5 Equip INSET centres and other schools with necessary materials according to the standards
 - 2-6 Strengthen the function of DCE as a resource centre for INSET

3. Secondary math/science teachers are trained at cluster-level INSET.
 - 3-1 Sensitize the teachers on the importance of INSET activities
 - 3-2 Sensitize the teachers on gender issues in maths/science education.
 - 3-3 Develop monitoring and evaluation tools for teaching and INSET.
 - 3-4 Conduct the baseline study on the needs and capacity of teachers in methodology and subject knowledge
 - 3-5 Develop curricula for cluster-level INSET
 - 3-6 Develop teaching and learning materials for INSET
 - 3-7 Conduct INSET at INSET centres in clusters
 - 3-8 Monitor the teaching by teachers regularly during the term
 - 3-9 Conduct follow-up activities where necessary
 - 3-10 Develop a system to facilitate information sharing by teachers

4. Leadership at school, divisional and Ministry level is strengthened in terms of INSET administration.
 - 4-1 Sensitize the headmasters on the importance of INSET activities
 - 4-2 Organize training sessions for strengthening administrative capacity at school, divisional and Ministry level
 - 4-3 Publicize INSET activities through newsletters, circulars, websites, e-mails, etc.
 - 4-4 Hold conferences for maths/science education to publicize the Project activities

5.4 Inputs

(1) Japanese Side

- Dispatch of long-term experts.

- Dispatch of short-term experts.
- Training of counterpart personnel in Japan, Kenya and other countries.
- Provision of equipment.
- Expenses necessary for the implementation of the Project.

(2) Malawian Side

- Assignment of counterpart personnel.
- Assignment of administrative personnel.
- Buildings and facilities necessary for the Project.
- Allocation of the budget necessary for the Project.

5.5 Important Assumptions

- The numbers of trained Core Trainers and other personnel are maintained.
- The master plan for DCE, which envisages the establishment of Faculty of Distance and Continuing Education, is approved.
- INSETs are carried out also in the divisions other than SEED.
- The stability of the teaching force is maintained.

5.6 Pre-conditions

- TSC and TUM do not oppose the Project.

6. Ex-ante Evaluation

6.1 Relevance

Firstly, since it is widely recognized in Malawi that improvement in people's maths/science abilities is essential for national development, this Project, which aims to improve the quality of teaching in maths/science, meets with the needs of Malawi as a country. On the other hand, as many of the secondary maths/science teachers (the target group of the Project) hope to improve the subject knowledge and teaching methods related to their teaching, the Project also meets with the needs of the target group. Therefore, the necessity for the Project is high.

Secondly, the Project is consistent with the national plan for educational development, PIF, which puts emphasis on "continuous professional education for teachers (through INSET etc.)". The Project is also consistent with the Japanese aid policy, which promotes "capacity development for maths/science education in Africa" and "South-to-south cooperation within African region", and with JICA's current Country Project Implementation Plan for Malawi. Therefore, the Project has high priority.

Thirdly, the approach selected for the Project (INSET targeting teachers) is appropriate in terms of benefit against cost, feasibility, sustainability etc., as an effective strategy for a development objective in Malawi,

“expansion of secondary education”. The Project, which emphasizes methodological improvement, can also expect some synergy with SSTEP by CIDA, which puts more emphasis on “imparting subject knowledge”. With regard to the target group of all of about 350 maths/science teachers in SEED, it is of appropriate scale, considering the establishment of an INSET system which emphasizes monitoring and the resource limitation on the Malawian side. With regard to targeting one Division (SEED) out of 6 Divisions in Malawi, it is appropriate, because of the existence of DCE, which has accumulated the experience of cooperation with Japan, the expectation of utilizing the DCE facilities which are being extended through Japan’s grant aid, and the existence of similar INSET programme in secondary maths/science at Mzuzu University in North Division. The ripple effect on the people other than the target group is also expected, through holding workshops for SSTEP students, who come to DCE from all over Malawi, improving methodology of pre-service training at DCE by those who are trained under the Project, and publicity activities on the Project. The benefit by the Project such as “improved methodology” and “increased knowledge and skills”, and the cost for the Project such as opportunity costs by participating in workshops are distributed equally within the target group. In the field of secondary maths/science education, which the Project targets, many projects have been already implemented. Especially in SMASSE Project in Kenya, the capacity of Kenyan counterparts are built to the extent that they can be utilized as an input for the Project. Necessary skills for the Project have been accumulated in Japan, which gives Japan a clear advantage. Therefore, the Project is also appropriate as a means to achieve the objective.

Overall, it can be evaluated that the relevance of the Project is high.

6.2 Effectiveness

Firstly, the Project Purpose of the Project, “Quality INSETs for secondary mathematics and science teachers are provided in SEED”, is clearly described, and its indicators, “the number of Core Trainers and administrative staff who are engaged in INSET”, “the quality of Core Trainers” and “the quality of INSET” are precisely reflecting the Project Purpose of providing INSETs 1) of good quality 2) regularly 3) by Core Trainers of good quality. The target figures for these indicators are adequate, considering the status quo of the target area, the Project inputs and activities, and their means of verification are also appropriate, as these are measured within the Project. Therefore, the Project Purpose of the Project is appropriate.

Secondly, the purpose of the Project is “the provision of quality INSETs”, but not “the institutionalization of the system”, which takes much longer. It can be achieved by the end of the Project (3 years later) as an effect of the Project. Four Outputs of the Project, “Trained Core Trainers”, “Equipped schools”, “Trained teachers” and “Improved leadership” are sufficient for achieving the Project Purpose. Two Important Assumptions, “continued support from the Ministry” and “approval of the master plan for DCE”, are likely to be fulfilled. No impeding factors against the achievement of the Project Purpose can be found.

Therefore, the causal relationship between the Project Purpose and the Outputs of the Project is appropriately understood.

Overall, the effectiveness of the Project is estimated to be high.

6.3 Efficiency

Firstly, the indicator for each Output is precisely reflecting the contents of the Output, and its target is appropriately set according to the status quo in Malawi and the Project inputs. All of these indicators can be obtained easily from the Project records. Therefore, the Outputs of the Project are appropriate.

Secondly, sufficient activities are planned for producing each Output, and the inputs of one Japanese long-term expert, several Japanese and SMASSE-WECSA short-term experts, counterpart training, and equipment provision, are just sufficient quantitatively and qualitatively for the planned activities. The important assumption, “the numbers of trained Core Trainers and other personnel are maintained”, is likely to be fulfilled. Therefore, the causal relationship between the Outputs and the Activities of the Project is appropriately understood.

Thirdly, the timing for the Project Inputs is appropriately planned, as a long-term expert is dispatched at the beginning of the Project and later Japanese or SMASSE-WECSA short-term experts are dispatched as necessary at the appropriate timing according to the Project activities.

Fourthly, compared to a similar SMASSE Project Phase 1 in Kenya (1998 ~ 2003), the Project takes an approach of making the most of the third-country short-term experts instead of Japanese long-term experts, thus expected to produce the similar outputs and to achieve the similar purpose at lower costs. The unit cost for training one teacher for SMASSE Kenya was about 510,000 Japanese Yen, while that for the Project is estimated to be somewhat higher (about 700,000 Japanese Yen). This difference results from the comparatively generous Japanese input for organizing workshops and monitoring based on the status quo in Malawi, and it is inevitable. Additional reason is that the Project puts more emphasis on the monitoring of teaching at school level (which costs much) than SMASSE Kenya. In Malawi, a similar project in secondary teacher education, SSTEP, is being implemented with the support by CIDA, and its unit cost is about 480,000 Japanese Yen. However, SSTEP aims at upgrading under-qualified teachers of CDSS, and it can adopt a relatively less costly measure, i.e. distance education plus two-month residential courses. On the other hand, in order to achieve the purpose of the Project, “to improve the quality of teaching by practicing teachers”, it is necessary to hold workshops and monitor teachers’ teaching more frequently. The relatively higher cost for the Project is thus justified. Therefore, the Project is also appropriate in terms of its cost.

Overall, the efficiency of the Project is estimated to be high.

6.4 Impact

The indicator for the Overall Goal “to improve the quality of teaching of maths/science” is planned to be “Teaching Quality Index” which will be developed within the Project in such a manner that it precisely reflects the Overall Goal and it is also appropriate in terms of costs for data collection. It is expected that the Overall Goal “the improvement of the quality of teaching in Malawi” as an effect of the Project will be yielded, as long as the important assumptions “the institutionalization of INSET” and “the implementation of INSET in other divisions” are fulfilled. The Overall Goal “the improvement of the quality of teaching” is clearly relevant to the development objective in Malawi, “expansion of secondary education”. The important assumption “the institutionalization of INSET” is likely to be fulfilled, as long as the Project is successful and the Ministry continues promoting the improvement in secondary maths/science education. The other important assumption “the implementation of INSET in other divisions” is also likely to be fulfilled, as the Project will attempt to provide INSET opportunities for teachers also in other divisions and to disseminate the success of the Project through publicity over the areas where similar problems of secondary maths/science exist. No negative ripple effect by implementing the Project can be expected. Therefore, the Project is estimated to be appropriate in terms of its impact.

6.5 Sustainability

The support in the Government policy for INSET is expected to continue even after the Project implementation period, since the PIF, which points to the importance of continuous education for teachers, is a long-term plan till 2015. In addition, a plan more specifically concerned with teacher training, “National Strategy for Teacher Education and Development” is almost finalized. Although the Project sets one Division out of six Divisions in Malawi as a pilot site, it involves the mechanisms to facilitate the expansion of the effect after the Project period, such as the vigorous involvement of the Ministry headquarters (DTED, etc.) in the process of the Project implementation, the involvement of other institutions for teacher education (Mzuzu University, etc.), nationwide public relations activities, and the provision of the training opportunities for teachers of other divisions. The Project aims at establishing a *system*, which implies that institutional capacity required for continuing the Project activities even after the Project period will be strengthened. Thanks to the accumulation of experience since 2000, the ownership of the implementing agency (DCE) has been steadily enhanced. With regard to finance, the Malawian side will not be forced to bear a large share of the costs from the beginning of the Project, because of its severe financial constraints. However, the possibility of gradual cost sharing by the Malawian side within their capacity will be vigorously considered as the effect of the Project emerges. Since the counterparts in the Project aims at improving their knowledge and skills through advice of experts from SMASSE-WECSA, where the situations are similar to those in Malawi, they have a high likelihood of sustainably utilizing the knowledge and skills gained and of spreading them over other divisions. Therefore, the sustainability of the Project is expected to be high.

Appendix 1

Project Design Matrix (PDM)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
[Super Goal] The abilities of secondary school students in maths and science is improved in Malawi.			
[Overall Goal] The quality of teaching of maths and science is improved in secondary schools in Malawi.	By 2015, secondary maths/science teachers sampled nationally obtain mean of over 2.5 on the scale of 0 to 4 in the Teaching Quality Index administered by the EMAS of MoE.	Survey results by the EMAS.	The stability of the teaching force is maintained.
[Project Purpose] Quality INSETs for secondary maths and science teachers are provided by Core Trainers in SFED	(a) Every year, INSET is conducted at over 3 INSET centres in SEED. (b) By the end of the Project, Core Trainers obtain mean of over 3 on the scale of 0 to 4 in the Trainer Capacity Index administered by the Monitoring and Evaluation Team. (c) By the end of the Project, cluster-level INSETs obtain mean of over 2.5 on the scale of 0 to 4 in the INSET Quality Index through Pre- and Post- INSET and Session evaluation instruments administered by the Monitoring and Evaluation Team.	Project Monitoring and Evaluation reports.	INSETs are carried out also in the divisions other than SEED.
[Outputs] 1. Core Trainers for cluster-level INSET are trained. 2. Physical and material environment for INSET is improved. 3. Secondary math/science teachers are trained at cluster-level INSET. 4. Leadership at school, divisional and Ministry level is strengthened in terms of INSET administration.	1. By the end of the Project, over 50 Core Trainers undergo suitable training. 2. By the end of the Project, over 3 INSET centres and over 86 other schools are equipped according to the minimum standards set by the Project. 3(a) By the end of the Project, over 4 cluster-level INSET are held at each INSET centre. 3(b) By the end of the Project, over 300 teachers complete the modules for cluster-level INSET. 4. By the end of the Project, over 90 headmasters and over 20 division and Ministry officials participate training sessions for strengthening their administrative capacity.	Project records.	The master plan for DCE, which envisages the establishment of Faculty of Distance and Continuing Education is approved
[Activities] 1-1 Set the TOR and recruitment criteria for Core Trainers 1-2 Recruit Core Trainers 1-3 Organize induction courses for newly recruited Core Trainers 1-4 Develop curricula for Core Trainers' training 1-5 Develop INSET manuals for Core Trainers	[Inputs] 1. Japanese side: a Dispatch of long-term expert. b Dispatch of short-term experts. c Training of counterpart personnel in Japan, Kenya and other countries. d Provision of equipment.		The numbers of trained Core Trainers and other personnel are maintained.

1-6 Train Core Trainers at DCE and other institutions	e Expenses for organizing INSET	
1-7 Assess the achievement of each Core Trainer and provide additional support where necessary		
2-1 Set the designation criteria for INSET centres	2. Malawian side:	
2-2 Designate schools as INSET centers in clusters	a Assignment of counterpart personnel.	
2-3 Conduct the baseline study on the current physical and material environment at schools	b Assignment of administrative personnel.	
2-4 Set the minimum standards for INSET centres and other schools	c Buildings and facilities necessary for the Project.	
2-5 Equip INSET centres and other schools with necessary materials according to the standards	d Allocation of the budget necessary for the Project.	
2-6 Strengthen the function of DCE as a resource centre for INSET		
3-1 Sensitize the teachers on the importance of INSET activities		
3-2 Sensitize the teachers on gender issues in maths/science education.		
3-3 Develop monitoring and evaluation tools for teaching and INSET.		
3-4 Conduct the baseline study on the needs and capacity of teachers in methodology and subject knowledge		
3-5 Develop curricula for cluster-level INSET		
3-6 Develop teaching and learning materials for INSET		
3-7 Conduct INSET at INSET centres in clusters		
3-8 Monitor the teaching by teachers regularly during the term		
3-9 Conduct follow-up activities where necessary		
3-10 Develop a system to facilitate information sharing by teachers		
4-1 Sensitize the headmasters on the importance of INSET activities		[Pre-conditions]
4-2 Organize training sessions for strengthening administrative capacity at school, divisional and Ministry level		TSC and TUM do not oppose the Project.
4-3 Publicize INSET activities through newsletters, circulars, websites, e-mails, etc.		
4-4 Hold conferences for maths/science education to publicize the Project activities		

Plan of Operation (PO)

Activities	Target																
	2004			2005			2006			2007							
	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	
1. Core Trainers for cluster-level INSET are trained.																	
1) Set the TOR and recruitment criteria for Core Trainers																	
2) Recruit Core Trainers																	
3) Organize induction courses for newly recruited Core Trainers																	
4) Develop a curriculum for Core Trainers' training																	
5) Develop INSET manuals for Core Trainers																	
6) Train Core Trainers at DCE and other institutions																	
7) Assess the achievement of each Core Trainer and provide additional support where necessary																	
2. Physical and material environment for INSET is improved.																	
1) Set the designation criteria for INSET centres																	
2) Designate schools as INSET centres in clusters																	
3) Conduct the baseline study on the current physical and material environment at schools																	
4) Set the minimum standards for INSET centres and other schools																	
5) Equip INSET centres and other schools with necessary materials according to the standards																	
6) Strengthen the function of DCE as a resource centre for INSET																	

Appendix 3

Tentative Schedule of Implementation (TSI)

Subject of Activities	2004			2005			2006			2007		
	1	4	7	10	1	4	7	10	1	4	7	10
I. Term of Cooperation												
II. Inputs by the Malawian Side												
1. Building and facilities												
2. Assignment of counterpart personnel												
3. Assignment of administrative personnel												
4. Allocation of budget												
III. Inputs by the Japanese Side												
1. Dispatch of long-term experts												
2. Dispatch of short-term experts												
3. Training of counterpart personnel in Japan, Kenya and other countries												
4. Provision of equipment												
5. Dispatch of consultation/evaluation teams												
IV. Joint Coordinating Committee												
V. Preparation for INSET												
1. Counterpart training at DCE and other institutions												
2. Development & production of materials for INSET												
VI. In-service Training Course												
1. Core Trainers' training at DCE												
2. Cluster-level INSET at selected schools												
VII. Monitoring and Evaluation for INSET												

Appendix 4 : Terms of Reference for JICA Experts

1. Japanese long-term expert (INSET planning & Administration / Coordinator)

The roles of Japanese long-term expert include:

[As a team leader]

- To provide necessary assistance and suggestions to the Project Director (Secretary for Education), the Project Managers (The Director of DTED, MoE and the Principal of DCE), and the National Project Coordinator (Dean, Faculty of Science, DCE) on any matters pertaining to the implementation of the Project;
- To oversee the planning, coordination, and implementation of the activities of the Project;
- To liaise with JICA, MoE, DCE and INSET centres to ensure the smooth implementation of the Project activities.

[As a project coordinator]

- To coordinate the Project activities;
- To manage the Project funds;
- To take care of the provision of equipment and materials from JICA;
- To conduct public relations activities;
- To be in charge of any other duties necessary for the Project.

[As an expert in INSET planning & administration]

- To provide technical assistance in matters pertaining to the Project implementation;
- To facilitate INSET sessions;
- To monitor and evaluate the Project activities.

2. Japanese and SMASSE-WECSA short-term experts

The roles of Japanese and SMASSE-WECSA short-term experts include:

- To work with Malawian counterpart personnel in planning, coordinating and implementing the activities of the Project;
- To provide technical assistance in matters pertaining to the Project implementation;
- To facilitate INSET sessions;
- To monitor and evaluate the Project activities.

Appendix 5 : Terms of Reference for Malawian Personnel

1. National Project Coordinator

The major duty of National Project Coordinator is the general administration of the Project activities at all levels, which include the following responsibilities:

- To link the INSET Unit with DCE, JICA, MoE, SEED, District Education Offices and other stakeholders;
- To be the Secretary to the Working Group;
- To implement the decisions made by the Working Group;
- To coordinate activities of Subject Heads;
- To formulate Project policy guidelines and activities for the Project implementation;
- To prepare and provide Project updates to all visitors;
- To approve leave of absence for the INSET Unit personnel;
- To be the custodian of INSET facilities and materials;
- To prepare, implement and control the INSET Unit budget;
- To coordinate and approve cluster-level INSET and programme budgets;
- To chair the INSET Unit staff meetings;
- To select and recruit Core Trainers;
- To coordinate the formulation and execution of subject policies at all levels;
- To carry out the duties of Core Trainers.

2. Project Administrators

The duties of Project Administrators include, among others assigned by National Project Coordinator, the following:

(1) Person in charge of divisional activities

- To be in charge of personnel management of Malawian staff;
- To control the quality of Core Trainers' training (facilities, materials etc.);
- To coordinate the activities carried out at divisional level;
- To plan, coordinate and implement stakeholders' workshops.

(2) Person in charge of cluster activities

- To plan, coordinate and implement cluster-level INSET;
- To control the quality of cluster-level INSET;
- To support the monitoring and evaluation of cluster-level INSET and teachers' teaching;
- To coordinate the selection of Core Trainers.

3. Subject Heads

The major duties of Subject Heads are the administration of activities related to each subject, as well as dealing with the academic matters of the subject, which include the following:

(1) Administrative duties

- To plan, organise and coordinate the Project activities in the subject at all levels;
- To formulate and execute subject policies at all levels;
- To procure, and maintain the records of, equipment and materials for the subject;
- To coordinate and conduct the monitoring and evaluation of the activities in the subject;
- To chair the subject-based meetings of the INSET Unit;
- To induct new personnel (both Malawian and JICA) in the subject;
- To be in charge of either Gender Issues, Publication, Research and Development or INSET Administration;
- To assign duties to Core Trainers in the subject;
- To be in charge of any other duties assigned by National Project Coordinator.

(2) Academic duties

- To coordinate development, tryout and production of INSET materials for the subject;
- To coordinate preparation and production of INSET programmes for the subject;
- To coordinate activities for designing and improving INSET curriculum;
- To coordinate the request for INSET materials for the subject;
- To control the quality of materials for cluster-level INSET;
- To prepare certification lists for INSET participants;
- To maintain the records of all the write-ups for presentations by Core Trainers in the subject;
- To maintain records and inventories for the subject;
- To carry out the duties of Core Trainers;

4. Core Trainers from DCE and selected schools

The duties of Core Trainers include:

- To design and improve curriculum for cluster-level INSET;
- To develop, try out and produce materials for cluster-level INSET;
- To identify and request for resources required for material development and actual INSET;
- To prepare and implement INSET programmes;
- To facilitate INSET sessions;
- To monitor and evaluate the INSET activities at cluster level;
- To write articles and news features for the newsletters;
- To publish the newsletters;
- To conduct research and analyse data;
- To promote gender awareness in mathematics and science education
- To be in charge of any other duties assigned by National Project Coordinator and Subject Heads of the relevant subject.

Appendix 6 : List of Major Equipment for the Project

1. Vehicles (4 wheel drive)
2. Computer sets
3. Printing machine sets
4. Photocopiers
5. Overhead projectors
6. LCD projectors
7. TV sets
8. Video cameras
9. Microscopes
10. Chemical balances
11. Apparatus for science experiments
12. Mathematics and science reference books
13. Cabinets for storing materials