Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by Malawi Office: January, 2022

Country Name	[Phase 2] The Project on Strengthening of Mathematics And Science in Secondary Education (SMASSE) INSET Malawi Phase 2 [Phase 3] Project for Strengthening of Mathematics And Science in Secondary Education in Malawi
Republic of Malawi	

I. Project Outline

Background	In Malawi, the quality of education suffered numerous challenges including lack of qualified secondary school teachers resulting in low Malawi School Certificate of Education (MSCE) pass rates. To address such issues, the Government of Malawi and JICA implemented a series of technical cooperation projects, SMASSE Phase 1 piloted 2004–2007 and scaled up as SMASSE Phase 2 (2008–2012). Both phases aimed to assist in developing Malawi's In-service Education and Training (INSET) system based on the concept of ASEI-PDSI (Activity, Student, Experiment and Improvisation-Plan, Do, See, and Improvement), which were developed under SMASSE projects in Kenya and then extended to other African countries. The Terminal Evaluation of SMASSE Phase 2 in 2012 documented successes. However, there remained significant challenges in improving the teaching capacity of most underqualified teachers and increasing the number of qualified teachers who know how to use practical teaching methodologies. Thus, SMASSE Phase 3 (2013–2017) was implemented to disseminate and sustain the outcomes of the preceding phases. While continuing to implement high-quality INSETs based on teachers' needs, SMASSE Phase 3 added a new components of Action Research and implementing practical methodology training for undergraduate students (trainees undergoing teaching practices) in pre-service teacher training (PRESET) institutions. This ex-post evaluation is for SMASSE Phase 2 and Phase 3.
Objectives of the Project	The project (Phase 2 and 3 combined) aimed to enable teachers in secondary mathematics and science education in Malawi to apply skills and knowledge acquired from INSET and PRESET through (1) strengthening Divisional Trainers' capacity, (2) strengthening National and Divisional INSET Centres, (3) implementing National and Divisional INSET as well as monitoring and evaluation (M&E), (4) strengthening the INSET management system, (5) incorporating the SMASSE approach in PRESET, and (6) conducting Action Research on INSET and PRESET at pilot schools, thereby improving the quality of teaching mathematics and science in secondary schools in Malawi. [Phase 2] 1. Overall Goal: The quality of teaching mathematics and science is improved in secondary schools in Malawi. 2. Project Purpose: Quality INSETs for secondary mathematics and science teachers at Divisional level are provided. [Phase 3] 1. Overall Goal: The quality of teaching mathematics and science is improved in secondary schools in Malawi. 2. Project Purpose: The teachers in secondary mathematics and science education in Malawi apply skills and knowledge acquired through INSET and PRESET.
Activities of the Project	1. Project site: Malawi 2. Main activities: [Phase 2] 1) Recruit and train National and Divisional Trainers 2) Designate and launch National and Divisional INSET Centres 3) Develop curriculum for-, implement and monitor & evaluate National and Divisional INSETs 4) Establish INSET Committees; sensitize stakeholders; publicize INSET activities [Phase 3] 1) Train National Trainers; review curriculum and training materials; and implement and monitor & evaluate National and Divisional INSETs 2) Train or sensitize stakeholders from national to school levels; equip with National and Divisional INSET Centres with necessary materials; develop manuals/guidelines 3) Sensitize PRESET institutions; incorporate the redefined ASEI/PDSI into course outlines of math and science education methodology 4) Develop tests; conduct an assessment on students' perception in teaching and learning at pilot schools; prepare research documents and share them in Malawi and internationally 3. Inputs (to carry out above activities) Japanese Side [Phase 2] * As of Terminal Evaluation 1) Experts:(Long-term) 2 persons; (Short-term) 2 persons 2) Trainees received: (Japan) 4 persons; (Malaysia, Kenya) 39 persons 3) Equipment: Science equipment and chemicals, stationery, reference books, etc. 4) Local cost [Phase 3] * As of Terminal Evaluation 1) Experts: (Long-term) 4 persons; (Short-term) 4 persons 2) Trainees received: (Japan) 55 persons; (Kenya, Malawian Side [Phase 2] 1) Staff allocated: 40 persons 2) Land and facilities: Project office for the SMASSE Secretariat in Department of Teacher Education and Development (DTED), national INSET centre in Domasi College of Education, and divisional INSET centres (19 secondary schools nation-wide) 3) Local cost: Cost for M&E and allowance and transportation for participants [Phase 3] 1) Staff allocated: 23 persons 2) Land and facilities: Project office (DTED), National INSET Centre (DCE), Divisional INSET Centres (19

	Zambia, and Malaysia) 43 persons 3) Equipment: Laptop computers, projectors, printers, photocopiers, video cameras, lab apparatus, etc. 4) Local cost	Secondary Schools) 3) Local cost	
Project Period	[Phase 2] (ex-ante) August 2008 – August 2012 (actual) August 2008 – August 2012 [Phase 3] (ex-ante) April 2013 – March 2017 (actual) August 2013 – August 2017	Project Cost	[Phase 2] (ex-ante) 321 million yen (actual) 346 million yen [Phase 3] (ex-ante) 424 million yen (actual) 263 million yen
Implementing Agency	Ministry of Education, Science and Technology (MoEST)		
Cooperation Agency in Japan	–		

II. Result of the Evaluation

<Constraints on Evaluation>

- Due to the COVID-19 pandemic, we were unable to conduct a field survey. Therefore, this evaluation is based on the information provided by the implementing agency and secondary data. For the same reason, detailed information was not available. Therefore, indicators for which sufficient data for verification were not available were determined to be "not verifiable."

<Special Perspectives Considered in the Ex-Post Evaluation>

- Based on the logical relationship between the two phases and following the JICA's framework of phase-integrated evaluation, this evaluation handled Phase 2 and Phase 3 as an integrated intervention (one project) and used the Overall Goal and Project Purpose of Phase 3 as those of the integrated intervention. To assess the achievement level of these objectives, used the indicators of Phase 3.
- The continuation status of project effects was assessed based on the status of the Project Purpose Indicator (including qualitative assessment) and key outputs, i.e., INSET, PRESET, and Action Research.

1 Relevance

<Consistency with the Development Policy of Malawi at the Time of Ex-Ante Evaluation >

At the time of Phase 2 ex-ante evaluation, this project was consistent with the Policy and Investment Framework 2000–2015, which aimed to improve education quality as one of the five objectives. The institutionalization of INSET and the continuous development of teachers for secondary education are included in the scope of the National Education Sector Plan (NESP) 2008–2017, the Education Sector Implementation Plan (ESIP) 2009–2013, and the National Strategy for Teacher Education and Development 2007–2017.

At the time of Phase 3 ex-ante evaluation, the project was consistent with the Malawi Growth and Development Strategy (MGDS) II 2011–2016. Also, SMASSE is stated as one of the national policies in ESIP II 2013–2018 (Policy 3.3 Teacher Training) and in the NESP (2008–2017).

<Consistency with the Development Needs of Malawi at the Time of Ex-Ante Evaluation >

At the time of ex-ante evaluation of both Phases, this project was consistent with the needs for teacher training as mentioned in "Background" above.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

At the time of Phase 2 ex-ante evaluation, the Japanese aid policy towards Malawi included "human resource development" as one of the three priority areas of assistance. This priority area included a subcomponent of "the dissemination and quality improvement of education.[1]

At the time of Phase 3 ex-ante evaluation, the Country Assistance Policy for the Republic of Malawi (2012) included "improvement of basic social services" as one of the two priority areas of assistance. The central components of this priority area were education and water. In the education sector, the Policy stated that "While most donor support is concentrated on primary education, the enrollment rate and quality of education in secondary education is overwhelmingly low. Therefore, Japan will focus on supporting the development and expansion of secondary education, in which Japan has a comparative advantage, and contribute to the creation of leaders for national development."

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the Time of Project Completion>

The Project Purpose was partially achieved by the time of the Phase 3 completion. First introduced to Southeast Education Division under Phase 1, INSET was in place nationwide by the end of Phase 2. Under Phase 3, PRESET and Action Research were introduced as planned. As a result, the ASEI/PDSI Index, a measure introduced by the project to assess the degree of teachers' application of the ASEI/PDSI approach in lessons, showed steady improvement from 1.10 in 2009 to 2.15 in 2016 against the target of 2.50. However, it should be noted that this result does not reflect the effect of PRESET, which was newly introduced in Phase 3. Students in the teacher training institutions who studied under the new curriculum with the ASEI/PDSI principles had yet to become teachers since the related project activities had been delayed.

<Continuation Status of Project Effects at the Time of Ex-Post Evaluation>

The project effects partially continued to the time of ex-post evaluation. Regarding INSET, the Ministry of Education, Science and Technology (MoEST) conducted National and Divisional INSETs every year. The number of participants in National INSETs was higher than during project implementation. Both National and Divisional INSET continued to have certain number of participants, it, however, was in decreasing trend in recent years. It may be suggested that such trend could lead to decrease in the number of teachers applying or getting new knowledge to continue the ASEI/PDSI principles. The 2020 INSETs failed and were postponed to 2021 due to the COVID-19 pandemic.

Regarding PRESET, with the continued incorporation of the ASEI/PDSI principles in their curriculum, the three teacher training institutions, namely, Chancellor College, Nalikule College of Education, and Domasi College of Education, assure that teachers who go

[1] ODA country data collection (2008)

through the PRESET programs have an opportunity to acquire and apply this practice in their teaching.

Action Research, which was envisaged to feed into and inform the designing of INSET and PRESET program, did not continue at the school or cluster level after the project, although there is a revival effort in the Research, Monitoring and Evaluation Department of DTED to bring it back. This would entail limited improvement in the designing of the INSET and PRESET programs because the basis for doing that was missing.

The continuation status of the Project Purpose Indicator could not be verified quantitatively as measurements for the ASEI/PDSI Index were not performed after project completion. However, it was somehow inferred qualitatively that teachers continued to use the ASEI/PDSI approach in lessons. Through the monitoring visits by DTED, most teachers were using ASEI/PDSI approach with confidence and applied knowledge gained from INSET and PRESET.

Implementation status of INSET and PRESET (Unit: persons)

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Number of teachers who participated in National INSET	192	177	244	-	254	-	216	194	287	275	271	-
Number of teachers who participated in Divisional INSET	-	2,931	2,756	-	2,744		2,962	3,107	2,912	2,484	2,637	-
Number of teachers who learned methodologies with the syllabus including ASEI/PDSI in PRESET at Chancellor College	-	-	-	-	-	-	-	-	63	62	73	112

Source: Phase 2 Terminal Evaluation Report, Phase 3 Terminal Evaluation Report, DTED, and Chancellor College
Note: INSET or PRESET were not conducted in some years due to lack of budget. The Divisional INSET in 2013/14 and 2014/15 constitute one batch.

<Status of Achievement of the Overall Goal at the Time of Ex-Post Evaluation>

The Overall Goal was partially achieved. The fact that teachers and head teachers ensure they do not miss INSET is an indication that they have seen and appreciated the benefits of the skills and knowledge they get from the INSETs. The teachers' longing for more trainings is an indication that they are willing to see more improvement in the way they teach and address any difficult areas and approaches in their teaching practices (Indicator 1). The results of the nationwide inspection conducted by Directorate of Quality Assurance Services (DQAS) in 2019 showed that the science and mathematics lessons are at least partially meeting the target achievement levels of the National Education Standards set by the project (Indicator 2).

<Other Impacts at the Time of Ex-Post Evaluation>

No negative impacts have been observed. Regarding positive impacts, we collected data of Malawi School Certificate Examination (MSCE) pass rates, which is the indicator for the Super Goal of this project of improving students' achievement in secondary mathematics and science in Malawi.[2] A growing improvement in the MSCE results is seen for both boys and girls. Although it is difficult to examine correlation, this can be partly attributed to the quality teaching that teachers practice in the schools, as advocated by the project. The fact that majority of secondary school learners are in community day secondary schools which have the least qualified teachers, it is important to note that the improvement in the results of the MSCE could be an indication that more teachers in those schools have acquired confidence and improved their skills in the teaching of science subjects as a result of the project's initiatives.

MSCE pass rates

Year	MSCE (%)		
	Boys	Girls	All
2016	62	50	57
2017	59	50	56
2018	66	53	60
2019	69	57	63
2020	47.32	34.64	41.42

Source: NESP, 2000
Note: Data on performance in mathematics and science by gender is not available.

<Evaluation Result>

Therefore, the combined effectiveness/impact of the project is fair.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source
(Project Purpose) The teachers in secondary school mathematics and science education in Malawi apply skills and knowledge acquired through INSET and PRESET teaching.	Indicator Secondary mathematics and science lessons sampled nationally obtain a mean score of over 2.5 on a scale of 0 to 4 in the ASEI/PDSI Index, administered by the Project Monitoring and Evaluation (M&E) Team.	Status of the Achievement (Status of the Continuation): Partially achieved (Not verifiable) (Project Completion) ASEI/PDSI Index: 2009: 1.1; 2010: 1.7; 2011: 1.8; 2015: 1.92; 2016: 2.15 (Ex-post Evaluation) There are no measurement results.	source: Phase 3 Terminal Evaluation Report, DTED
(Overall Goal) The quality of teaching mathematics and science is improved in secondary schools in Malawi.	Indicator 1 The degree of attitude change (in teaching) of secondary mathematics and science teachers assessed by; (i) secondary mathematics and science teachers (ii) secondary school head teachers.	(Ex-Post Evaluation) Partially achieved i) The attitude of teachers changed. Teachers are no longer skipping difficult topics. They are also demanding more training both at the national and divisional levels. Teachers have seen that the trainings improve their teaching skills, giving them the confidence to handle any topic. ii) The measurement of head teachers' assessment of mathematics and science teachers was not done during the monitoring visits. HOWEVER, the DTED team believes that head teachers' support	source: DTED Monitoring Visits

[2] The Phase 2 Super Goal: "The abilities of secondary school students in mathematics and science are improved in Malawi." The Phase 3 Super Goal: "Students' achievement in secondary mathematics and science is improved in Malawi."

		towards the teaching of mathematics and science through the provision of necessary equipment and lab materials is an indication that they appreciate and promote the skills the teachers get from the training.	
	Indicator 2 Secondary mathematics and science lessons sampled nationally obtain the mean of 2.5 or better on the scale of 1 to 4 according to the National Education Standard.	(Ex-Post Evaluation) Partially achieved In 2019, the DQAS embarked on National Wide inspection for science and mathematics lessons. Over 30% of the lessons observed were rated above minimum standard. Results from Education Division Inspection is not different to the above findings. National Education Standards' scale has 4 levels with the Level 1 being below minimum standards; Level 2 being Meets minimum standards, Level 3 being Exceeds Minimum Standards and Level 4 being Effective Practice. The average value of the levels rated in the above-mentioned inspection, assuming equal level intervals, is calculated to fall between the lower limit of Level 3 x 30% + Level 1 x 70% = 1.6 and the upper limit of Level 4 x 30% + Level 2 x 70% = 2.6.	source: DTED

3 Efficiency

The project cost and the project period were both within the plan (ratio against the plan: 82% and 100%, respectively).[3] The Outputs were produced as planned. Therefore, the efficiency of the project is high.

4 Sustainability

<Policy Aspect>

The MoEST continues to regard mathematics and science as core fields for knowledge acquisition by both teachers and learners, as evidenced in featuring them in the National Education Sector Investment Plan (NESIP) 2020–2030, Malawi Vision 2063 and the Continuing Professional Development (CPD) Framework for Teachers and Teacher Education 2019.

<Institutional/Organizational Aspect>

The DTED has a full-fledged structure to ensure efficient leadership and delivery of the SMASSE program at both the national and school levels. The MoEST has made an effort to fill all the important positions, such as Director and Deputy Directors for INSET and Deputy Director for PRESET. However, this does not rule out the possibility of some of them falling vacant again since turnover is high in the Ministry. The number of National Trainers for SMASSE has decreased from eight to five due to promotions to other institutions. For PRESET activities, the required number of eight is in place.

<Technical Aspect>

For INSET, Lecturers, National and Divisional Trainers still facilitate in National and Divisional INSET every year. For PRESET, Lecturers use the skills in their day-to-day work since the SMASSE principles have been incorporated in their curriculum. Manuals and materials have been developed and used in various contexts. For example, INSET manuals have been used during INSET sessions and teaching in schools as references. Monitoring tools have been adapted and used by officers in the DQAS during monitoring sessions.

<Financial Aspect>

The INSET program was completely adopted by the MoEST, and it receives a budget for the implementation of its activities. Although the PRESET institutions incorporated the project principles, it is not clear whether there is a budget at these institutions specifically for implementing principles introduced by the project. All educational institutions receive funding from the government through the MoEST, and it is up to them to fund activities deemed necessary including Action Research. However, Action Research was not institutionalized and decentralized to schools yet by the time the project ended making it difficult for schools to recognize it into their budget.

<Evaluation Result>

In light of the above, some problems have been observed in terms of the institutional/organizational and financial aspects of the implementing agency. Therefore, the sustainability of the project effects is fair.

5 Summary of the Evaluation

This project (Phase 2 and 3 combined) partially achieved the Project Purpose by the end of Phase 3. The measurement results of the indicator showed that secondary mathematics and science teachers had improved the application of skills/knowledge acquired from INSET, but the measurement did not reflect the effects of PRESET due to delays of related activities. Both National and Divisional INSETs and PRESET incorporating the ASEI/PDSI approach continued to the time of ex-post evaluation, while Action Research did not continue. The Overall Goal of providing quality lessons was partially achieved at the time of ex-post evaluation as the attitude change in teaching was qualitatively verified to some extent and a recent measurement of the National Education Standard shows a certain degree of achievement of the target. Regarding sustainability, there are some concerns, such as potential understaffing of SMASSE-related personnel and lack of budgeting for Action Research. However, policies and the organizational structure to support SMASSE activities are in place, and the technical aspect has no problem.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

Continuation of reporting on classroom and school practices would be effective if schools or clusters are given this responsibility. Action Research has to be mainstreamed and budgeted as an integral part of SMASSE activities that receive government funding. For these purposes, the SMASSE Secretariat and schools are recommended to include monitoring of SMASSE practices, including Action Research, before the next budgeting session, by introducing a calendar of SMASSE and Action Research to ensure that there is continuity of these activities.

[3] Total for Phase 2 and 3.

Lessons Learned for JICA:

SMASSE was effectively mainstreamed as the MoEST took ownership of the project because of the positive impact it has shown over the years on improving the quality of teaching science and mathematics. Phase 3 of the project enabled the MoEST to introduce critical complementary support components to teacher development, such as the PRESET curriculum and Action Research, which were not conceived in the previous phases. It, however, became difficult for stakeholders to continue with Action Research possibly because of their limited knowledge on linkages among project components. The ministry did not fully integrate Action Research activities into SMASSE, although they knew its role in informing the INSET/PRESET programs. This problem led to their failure to introduce Action Research on the SMASSE budget effectively.

Because Action Research came as an after-thought to strengthen the model of teacher development established through Phase 2, it might be more difficult for all the stakeholders to understand a comprehensive map of the various actors and their role for the sustainability of the different project activities.

From these experiences, it is learned when new activities are to be incorporated in the later phases of long-term cooperation, such as SMASSE, care should be taken to ensure that they are fully integrated into the already established system.

(2016) A SMASSE Expert and a Biology Teacher Discussing Progress of a Lab Session

SMASSE Divisional Trainers Discussing Challenges in Teaching and Ways of Tackling Them