

**Finding Report of Mid-term Review Study on  
The Strengthening of Mathematics and Science Education (SMASE) Project**

**(WECSA Component)**

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## Abbreviations

ADEA	Association for Development of Education in Africa
API	ASEI-PDSI practice index
ASEI- PDSI	Activity, Student-centered, Experiment and Improvisation- Plan, Do, See and Improve
CEMASTEA	Centre for Mathematics, Science and Technology Education in Africa
DAC	Development Assistance Committee
FPE	Free Primary Education
FDSE	Free Day Secondary Education
GOJ	Government of Japan
GOK	Government of Kenya
ICT	Information and Communication Technology
INSET	In-service Education and Training
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
Ksh	Kenyan Shilling
LII	Lesson Innovation Index
LOU	Letter of Understanding
M&E	Monitoring and Evaluation
M/M	Minutes of Meeting
MOU	Minutes of Understandings
M/S	Mathematics and Science
MOE	Ministry of Education
MOU	Minutes of Understanding
NPC	National Planning Committee
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
PDM	Project Design Matrix
PO	Plan of Operations
QRI	Quality Learning Index
R&D	Research and Development
R/D	Record of Discussions
SAGA	Semi Autonomous Government Agency
SMASE	Strengthening of Mathematics and Science Education
SMASE-WECSA	Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa

SMASSE	Strengthening of Mathematics and Science in Secondary Education
TCE	Third Country Experts
TCTP	Third Country Training Programme
TICAD	Tokyo International Conference on African Development
TW	Technical Workshop
UNICEF	United Nations Children's Fund
UON KSC	University of Nairobi, Kenya Science Campus
WRC	WECSA Regional Conference

## **1. Introduction**

### **1-1. Background of Project and Objectives of Mid-term Review**

The Government of Kenya (GOK) introduced Free Primary Education (FPE) in 2003 and Free Day Secondary Education (FDSE) in 2008, which have rapidly expanded access to education in Kenya. With the effort of policy implementation by the GOK, the primary school enrolment rose from 68.8% (1999) to 91.4% (2010) and the secondary enrolment from 13.7% (1999) to 32.6% (2010) (MOE, EMIS). However, the quality of education, particularly the learning achievement in mathematics and science, faces numerous challenges.

The Kenya Education Sector Support Programme (KESSP 2005-2010) identifies several challenges leading to low academic performance, such as low level in “textbook-pupil/student ratio” and “teaching skills and teacher’s ability to understand subject matters.” Kenya’s national long-term development vision (Vision 2030) aims to transform the country by 2030, into an industrialized nation and indicates to raise quality of education and research as one of its foundations for sustainable development of economic growth.

To improve the quality of education, the GOK had requested the Government of Japan (GOJ) to provide a series of technical cooperation projects such as the “Strengthening of Mathematics and Science in Secondary Education (SMASSE) Project (hereinafter referred to as “SMASSE”)” and “SMASSE Phase 2,” which aimed to promote in-service education and training (INSET) for mathematics and science teachers. Through these efforts, a system of INSET has been established and the achievements of the Project were highly valued in terms of the relevance and sustainability during the final evaluation of SMASSE Phase 2.

The successful results of the SMASSE project in Kenya led to 34 African countries to unite under a common goal to solve the current challenges being faced in mathematics and science education at the basic education level and organize the “Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa (SMASE-WECSA) Association.”

The activities of SMASE-WECSA, such as SMASE-WECSA regional conferences and the Third Country Training Programme (TCTP), contributed to promoting mathematics and science education and the establishment of the INSET system in SMASE-WECSA member countries in Africa.

The achievements in mathematics and science education at the secondary education level and the

positive influence on other countries in Africa through SMASSE and SMASSE Phase 2, led the GOK to request further technical cooperation with the GOJ in order to implement the primary INSET in Kenya and strengthen the SMASE-WECSA network in Africa.

Thus, the Japan International Cooperation Agency (JICA) and the Ministry of Education (MOE) of Kenya, through cooperation with the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEА) started the five-year-project called the “Strengthening of Mathematics and Science Education (SMASE)” in January 2009, which is expected to be completed in December 2013. The activities of the Project are composed of the following two components: 1) Kenyan Component targeting Kenyan education, and 2) WECSA Component targeting SMASE-WECSA member countries.

The Mid-term Review Study of the SMASE Project has been undertaken jointly by the Japanese Team and MOE officials in order to analyze the achievements and results of the Project. The main objective of the Review is to clarify the issues and measures to be taken for the further improvement of the Project during the remaining period. The review reports have been jointly compiled by the Kenyan and Japanese sides. This volume reports the results of the mid-term review of the WECSA component.

## 1-2. Members of the Review Study Team

A Joint Evaluation Committee was organized by members from both the Kenyan and Japanese sides for the Mid-term Review Study as shown in Table 1.

**Table 1: Joint Evaluation Committee Members**

<b>Kenyan Side</b>	
Prof. James Ole Kiyiapi	Permanent Secretary, MOE
Prof. George I Godia	Education Secretary, MOE
Mr. Kimathi M’Nkanata	Director of Field and Other Services
Mr. Enos O. Oyaya	Director of Quality Assurance and Standards, MOE
Ms. Cecilia Ngetich	Director, CEMASTEА
Mr. Garise Omara	SMASE Desk Officer, Directorate of Field and Other Services, MOE
Mr. Charles Kanja	Officer, Directorate of Field and Other Services, MOE
Ms. Dorothy Ogega	Officer, Directorate of Basic Education, MOE
Mr. Musilu Kilonzo	Officer, Directorate of Secondary Education, MOE
Mr. Patrick Kogolla	Coordinator of Academic Programme, CEMASTEА
Mr. Daniel Muraya	Coordinator of Research and Development Department, CEMASTEА
<b>Japanese Side</b>	

Team Leader	Mr. Jun Sakuma	Deputy Director General, Basic Education Group, Human Development Department, Japan International Cooperation Agency (JICA)
Cooperation Planning	Ms. Minako Sugawara	Deputy Director, Basic Education Division II, Human Development Department, JICA
INSET Evaluation	Ms. Fumie Tsukagoshi	Associate Expert, Basic Education Division II, Human Development Department, JICA
Evaluation Analysis 1	Ms. Miho Ota	Senior Consultant, Consulting Department II, KRI International Corporation (Kenya Component)
Evaluation Analysis 2	Mr. Shinichiro Tanaka	Senior Consultant, Education Development Division, Overseas Business Management Division, PADECO Co., Ltd. (WECSA Component)

### 1-3. Schedule of the Review Study

Mid-term review was conducted from 29<sup>th</sup> October to 1<sup>st</sup> December 2011, and entailed visiting three countries including Kenya, Uganda and Rwanda. Detailed schedule is shown in Annex 4: Mid-term Review Schedule (WECSA).

### 1-4. Criteria of Evaluation

Table 2 shows the five evaluation criteria established by the Development Assistance Committee (DAC), and the Organization for Economic Co-operation and Development (OECD), which are to be applied in the Mid-term Review Study.

**Table 2: Five Evaluation Criteria**

Criterion	Explanation
Relevance	A criterion for considering the validity and necessity of a project regarding: whether the expected effects of a project (or Project Purpose and overall goal) meet with the needs of target beneficiaries; whether a project intervention is appropriate as a solution for problems concerned; whether the contents of a project is consistent with policies; whether project strategies and approaches are relevant, and; whether a project is justified to be implemented with public funds of ODA.
Effectiveness	A criterion for considering whether the implementation of project has benefited (or will benefit) the intended beneficiaries or the target society.
Efficiency	A criterion for considering how economic resource/inputs are converted to results. The main focus is on the relationship between project cost and effects.
Impact	A criterion for considering the effects of the project with an eye on the longer term effects including direct or indirect, positive or negative, intended or unintended.
Sustainability	A criterion for considering whether produced effects continue after the termination of the assistance.

Source: JICA (2004) "JICA Guideline for Project Evaluation." p. 21.



### **1-5. Review Process**

- (1) In accordance with the Record of Discussion (R/D) with the GOK, the results of inputs and activities, and the achievement of the Project Purpose and Outputs are assessed against the initial Project Design Matrix (PDM) (Annex 1) and Plan of Operation (PO) (Annex 2).
- (2) The overall achievements of the Project have been reviewed according to the DAC's five evaluation criteria.

### **1-6. Review Methods**

- (1) Literature Review (SMASE documents and project reports of other SMASE-WECSA member countries);
- (2) Analysis of SMASE Project M&E reports submitted by the SMASE project and other existing documents;
- (3) Questionnaire survey to the participants of SMASE-WECSA activities and related project experts in SMASE-WECSA member countries:
  - CEMASTE staff (n=32)
  - Participants from member countries (N=110)
    - 13 nations: Benin, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Mali, Niger, Nigeria, Rwanda, Senegal, Uganda, Zambia
  - Japanese experts in member countries (N =15)
    - 11 nations: Burkina Faso, Ghana, Ethiopia, Malawi, Niger, Nigeria, Rwanda, Senegal, South Sudan, Uganda, Zambia, and;
- (4) Interviews with concerned parties of WECSA activities in Nairobi and neighboring countries and with participants of TCTP in Kenya. List of interviewees is shown in Annex 5.

### **1-7. Limitations of the Review Study**

- (1) Limited time allowed for the Review work: time allowed for the Review work of the WECSA component is relatively limited compared to that of the Kenya component.
- (2) Limited representation of the SMASE WECSA member countries: the Review visited only two

member countries, while in total 27 members and 7 observer countries are part of the association. The project shall be able to compensate for this limitation by listening to more voices of the member countries in the forthcoming WECSA delegate meeting in December 2011.

## 2. Achievement of the Project

### 2-1. Result of Inputs

In general, the WECSA component utilises the same inputs as that of the Kenyan component, which have been made in accordance with the plan with minor modifications.

#### 2-1-1. Inputs by the Kenyan Side

##### (1) Buildings, Offices and Other Facilities

WECSA component activities utilize CEMASTEAs facilities. Please refer to the Kenya Component Review Report for more details.

##### (2) Counterpart Personnel

WECSA component has the same organization structure of counterpart personnel as the Kenya component (Refer to section 2-1-1 of Kenya Component report). At CEMASTEAs, Director of the centre serves as the Secretary of SMASE WECSA association. Aside from this, counterpart personnel have been assigned at CEMASTEAs to plan, implement and evaluate the WECSA component activities as described below.

- WECSA committee consists of 9 personnel and is in charge of the Third Country Training Program (TCTP).
- R&D department handles WECSA Regional Conference (WRC).
- Director's office handles Third Country Experts (TCE) and Technical Workshops (TW).
- One non-academic staff (secretary) of CEMASTEAs is assigned to support logistics and administration of the WECSA Secretariat function.

Furthermore, all of the CEMASTEAs staff participate in any of the WECSA component activities such as TCTP, TCE, TW, WRC, etc.

**Table 3: CEMASTEAs staff assigned to WECSA committee**

Department	Designation	Name	Committee
Biology	Lecturer	Mr. David Arimi	WECSA
Biology	Lecturer	Mr. Thuo Karanja	WECSA
Biology	Lecturer	Mr. Maina Nyingi	WECSA
Chemistry	Lecturer	Mr. Ndelela Masoka	WECSA
Chemistry	Lecturer	Mr. Richard Jakomanyo	WECSA
Mathematics	Lecturer	Mr. Simon Mugo	WECSA
Mathematics	Lecturer	Ms. Priscilla Ombati	WECSA
Physics	Dean	Mr. Chesire Berege	WECSA

Department	Designation	Name	Committee
Physics	Lecturer	Mr. George Gitau	WECSA

Source: CEMASTE A

### (3) Finance

Kenyan side provides a quarter-perdiem on top of the travel allowance provided by JICA. Besides this, member countries provide out-of-pocket allowances for TCTP participants according to the regulations of the respective government<sup>1</sup>.

## 2-1-2. Inputs from the Japanese Side

### (1) Equipment and facilities

All equipment and facilities provided by Japanese side are utilised for both the Kenyan and WECSA components.

### (2) Experts

All of the 5 Japanese experts assigned to the Project serve on both the Kenya and WECSA components. Currently one post (mathematics) has been vacant since June 2011.

### (3) Finance

On average an annual 50 million Kenyan Shillings (ksh) is budgeted for WECSA component activities, and it has been disbursed accordingly. The total amount of JICA's operational cost was Ksh.151,096,219.60, of which Ksh.42,539,960.66 was allocated for the activities in Kenya. The remaining (Ksh. 108,556,258.94) is spared for WECSA activities.

**Table 4: SMASE WECSA expenditure (khs million)**

	2008	2009	2010	2011	Total
Operational cost for activities in Kenya	2.64	11.09	19.60	9.19	42.53
WECSA component activities	1.84	50.70	54.87	1.12*	108.56
Total	4.49	61.79	74.48	10.32	151.09

Source: Project Document

\* Covers From 01 April 2011 to 12 August 2011.

## 2-2. Progress of Activities

<sup>1</sup> Member countries of the SMASE-WECSA association pay a registration fee of US\$ 100 and an annual subscription fee of US\$ 300.

**2-2-1 Activities under Output 1: ASEI/PDSI based INSET providers from member countries are trained.**

Activities under Output 1 have been implemented as planned with some modifications to the schedule, which has no negative influence on the overall project progress. So far a total of 7 regular and one country-specific (for South Sudan) TCTPs have been conducted with 456 participants from 26 member countries/areas.

**Table 5: TCTP during 2009-2011**

	<b>Title</b>	<b>Date</b>	<b>Participants (Countries)</b>	<b>Participants</b>
<b>2009</b>	TCTP 11	19 Sept. - 10 Oct.	<b>10 (Anglophone) Secondary:</b> Angola,(8) Botswana(8), Cameroon(4), Ethiopia(9), Gambia(8), Malawi(10), Mozambique(7), Tanzania(8), Uganda(7) and Zanzibar (8).	76
	TCTP 12	19 Sept. - 31 Oct.	<b>3 (Francophone):</b> Benin (6), Burkina Faso(9), Burundi(6), Cameroon(3) and Senegal(8)	31
	TCTP 13	19 Oct. - 6 Nov.	<b>7 (Anglophone):</b> Primary Ghana (6), Nigeria (8), Rwanda (8), Sierra Leone (8), Southern Sudan (8), Swaziland (8) and Zambia (6).	52
<b>2010</b>	TCTP 14	19 Sept. - 15 Oct.	<b>12(Anglophone):</b> Angola (8) , Botswana (8),Cameroon (4) , Gambia (8), Lesotho (4), Malawi (11), Mozambique (3), Namibia (8) Swaziland (4), Tanzania (8), Uganda (8), Zanzibar (8)	82
	TCTP 15	24 Oct. - 5 Nov.	<b>7(Francophone):</b> Benin (4), Burkina Faso (5), Burundi (4), Cameroon (3), Mali (4), Niger (5) & Senegal (5)	30
	TCTP 16	20 Oct. - 12 Nov.	<b>10 (Anglophone):</b> Ethiopia (6), Ghana (6), Lesotho (4), Mozambique (3), Nigeria (6), Rwanda (6), Sierra Leone (6), Southern Sudan (5), Swaziland (4) and Zambia (4).	50
<b>2011</b>	TCTP 17	17 Oct.- 4 Nov.	<b>11 (Primary):</b> Botswana (6), Ethiopia (4), Ghana (6), Mozambique (5), Namibia (6), Nigeria (6), Sierra Leone (6), South Sudan (6), Swaziland (6), Zambia (6), Zimbabwe (4)	62
<b>2009</b>	TCTP for South Sudan	19 Jan- 13 Feb	Trainer of trainers for South Sudan	73
<b>Total</b>				<b>456</b>

Source: Information for mid-term evaluation (p.94), and project document

Also there has been in total 30 TCEs sent from CEMASTEAs to 7 countries upon 16 requests. It is observed that TCE is on a sharp decline; there has been only one dispatch in 2011, while there were 12 and 3 dispatches in 2009 and 2010 respectively.

**Table 6: TCE service provided in member country (2009-2011)**

	Country	Date	TCE in charge	
1	Angola	15th -26th Mar. 2010	4	Kibanya, Arimi, Macharia,Okeyo Jackomanyo
2	Angola	14th - 22nd Mar. 2009	2	Mugo, Kireru
3	Angola	31st Oct.-17th Nov. 2009	4	Mugo, Kibanya, Gachuhi.Kizito
4	Angola	19th Nov. - 5th Dec. 2010	4	Gitau/Chiira, Lydia, Gathambiri
5	Niger	5th -14th Jan. 2009	1	Ogwel
6	Nigeria	14th Jun. - 26th Jul. 2009	1	Okaya, Tom, Mboya
7	Nigeria	8th Feb. - 2nd Mar. 2009	1	Nui
8	Rwanda	15th - 27th Nov. 2009	2	Kithaka, Ngeny
9	Senegal	3rd - 15th Mar. 2009	1	Orado Grace
10	Senegal	24th Sept.- 8th Oct. 2009	1	Matiri
11	Senegal	27th Jan. -12th Feb. 2009	1	Muraya
12	Senegal: WS	23rd Feb. – 1st Mar. 2009	1	Member country
13	Southern Sudan	5th -18th Sept.2010	2	Nyingi, Sichangi M.
14	Southern Sudan	7th -16th Jul. 2009	2	Masoka
15	South Sudan	13th – 26th November 2011	2	Rahab Chiira, Amimo
16	Tanzania	13th -17 th Jul. 2009	1	Waititu
		Total	30	

Source: "Information for mid-term evaluation 2011" (p.99), and Project Data

**Table 7: TCE dispatch**

	2009	2010	2011
TCE dispatch upon request	12	3	1

Source: "Information for mid-term evaluation 2011" (p.99), Project Information

### 2-2-2. Activities under Output 2 "SMASE-WECSA network is strengthened."

A variety of activities have been implemented as planned with some modifications to the schedule, including Technical assistance at CEMASTEAs (4 events), Technical workshops on improvement of lessons (5 events), SMASE-WECSA regional conferences (2 times), and annual delegates meetings (2 times).

**Table 8: Technical visit to CEMASTEAs**

Title	Duration	Venue	Participants	Person in charge
Mali MOE officials	7-14 Mar 2010	CEMASTEAs	12	Chesire
Senegal management	23-28 Feb. 2009	CEMASTEAs	17	Kisaka
South Africa Officials	3 Oct. 2010	CEMASTEAs	12	Waititu
Rwanda OJT	11-15 Jul. 2010	CEMASTEAs	5	Thuo, Maate, Waibochi, Gathambiri

Title	Duration	Venue	Participants	Person in charge
Sudan OJT	24 Jan. – 4 Feb. 2011	CEMASTEAM	4	Mary Sichangi, Makanda, Kuria, Mutua.

Source: "Information for mid-term evaluation 2011" (p.99)

**Table 9: Technical workshop in member countries (2009-2010)**

	Date	Person involved	Participating Members	Theme
Botswana	24 - 28 May 2010	Ngeny, Chesire, Matiri, Kiruja	35	Continuous Quality INSET Activities and Effective Lesson Observation Skills to Enhance ASEI-PDSI in the Classroom (@ Grand Palm Hotel) 5 nations participated: Malawi, Namibia, Swaziland, Zambia, and the host country Botswana.
Swaziland	25 - 29 May 2009	C.B. Chesire, F. Kamau, G. Kiruja, Mathenge	97	Enhancing Classroom Activities for Quality Teaching and Learning through Lesson Study(@Eshibayeni Lodge): Botswana, Ethiopia, Ghana, Mozambique, Nigeria, Rwanda, Tanzania, Uganda, and the host country Swaziland.
Uganda	23 -29 Mar.2009	Masai, Opel	32	Implementation of Good Lesson (Brief) (@ Sesemat INSET Centre). 6 nations participated: Kenya, Nigeria, Malawi, Zambia, Rwanda and the host country Uganda.
Uganda	22 - 26 Mar. 2010	Mercy, Maate, Ombati, Thuo	46	Capturing Learner's Ideas (@ Sesemat Training Centre, Kampala). 7 nations participated: Kenya, Ghana, Nigeria, Rwanda, Zambia, Ethiopia and the host country Uganda.
Zambia	8 -12 February,2010	Kamau	63	Workshop on Lesson Improvement, Problem Solving Approach (Briefs). 6 nations participated: Zambia, Kenya, Uganda, Nigeria, Rwanda, and the host country Zambia.
Total			273	

Source: "Information for mid-term evaluation 2011" (p.100) and project reports of respective member countries (JICA Technical Corporation)

**Table10: WRC 2009 and 2010**

Activities	Venue	Date	Theme	Participating countries	Participants
9th SMASSE WECSA conference	Grace Hotel, Nairobi	16-19 November 2009	Successful & Sustainable INSET Activities and Government Support for Quality Teaching and Learning.	Angola, Benin, Burkina Faso, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe, Burundi, and, Cameroon,	62

Activities	Venue	Date	Theme	Participating countries	Participants
10th SMASSE WECSA conference	Panafric Hotel, Nairobi	6-9 December,	A Reflection on a Decade of Promoting Mathematics and Science Education in Africa	Angola, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Mali, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe, and Benin	87

Source: "Information for mid-term evaluation 2011" (p.98)

**Table 11: SMASE-WECSA DELEGATES MEETINGS**

Activity	Date	Venue	Representation	Participants
9th delegates meeting	16th November, 2009	Grace Hotel, Nairobi	Burkina Faso, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe, Burundi, Cameroon, Malawi	22
10th delegates meeting	9th December, 2010	Panafric Hotel, Kenya	Burkina Faso, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe, Burundi, Cameroon, Malawi, Swaziland, Namibia	24

Source: "Information for mid-term evaluation 2011" (p.98)

### **2-2-3. Activities under Output 3 "Role of CEMASTEAs is strengthened as resource centre for Mathematics and Science education in Africa."**

It is commonly understood among the project personnel that there have been no significant progress made in activities under Output 3 in accordance with the plan. Some "resource" materials have been collected spontaneously, however, they are not systematically stored or disseminated. Moreover, potential clients of the resource centre function have not been determined, which is the central objective of the services.

## **2-3. Outputs**

### **2-3-1. Output 1: ASEI/PDSI based INSET providers from member countries are trained**

Among four verifiable indicators of Output 1, two of them have already achieved the targets. It is reasonably envisaged that qualities and effectiveness of the activities will be maintained during the remaining period of the Project, and therefore Output 1 will be achieved by the end of the Project.

**Table 12: Output 1 verifiable indicators**



Verifiable indicator of Output 1	Achievement
1) Verifiable Indicator 1(a): "TCTP at CEMASTEIA is carried out five times"	TCTP at CEMASTEIA is carried out five times; Two times had been carried out by 2010, and the third time is under way. So far 8 TCTPs have been implemented.
2) Verifiable Indicator 1(b): "At least 400 participants attend the TCTP at CEMASTEIA"	A total of 456 participants from 26 countries/areas attended TCTP.
3) Verifiable indicator 1(c): At least 40 sets of training materials are produced	Each TCTP consists of several sessions and there has been 1 "write-up" prepared for each session. A total of 59 "writes-up" (session resumes) have been prepared.
4) Verifiable indicator 1(d) M&E tools applicable to member countries are developed and used	M&E tool (Kenyan practice) have been presented and distributed at TCTP for member countries' reference, instead of development of a new tool.

### 2-3-2. Output 2: SMASE-WECSA network is strengthened

It is most likely that Output 2 will be achieved. Verifiable indicators set for Output 2 are numbers of WRC and countries participating in WECSA component activities, and their achievements to date are illustrated in the table below.

**Table 13: Output 2 verifiable indicators**

Verifiable indicator Output 2	Achievement																
Verifiable indicator 2(a): Regional conference and SMSE-WECSA delegates meetings are held at least four times	They have been held two times each, and the third one is planned for December 2011. It is scheduled to be held annually.																
Verifiable indicator 2 (b): Increased number of countries participating in SMASE-WECSA activities and implementing INSET	<p>Number of member countries has increased from 25 to 27.</p> <p>Table: WECSA member countries</p> <table border="1"> <thead> <tr> <th></th> <th>2009</th> <th>2010</th> <th>2011</th> </tr> </thead> <tbody> <tr> <td>Member</td> <td>25</td> <td>27</td> <td>27</td> </tr> <tr> <td>Observer</td> <td>9</td> <td>7</td> <td>7</td> </tr> <tr> <td>Total</td> <td>34</td> <td>34</td> <td>34</td> </tr> </tbody> </table> <p>Source: "Information for mid-term evaluation 2011" (p.102)</p>		2009	2010	2011	Member	25	27	27	Observer	9	7	7	Total	34	34	34
	2009	2010	2011														
Member	25	27	27														
Observer	9	7	7														
Total	34	34	34														
Verifiable indicator 2(c): Number of technical exchange notes: Letter of Understandings (LOU), Memorandum of Understandings (MOU) etc.	So far no new LOU, MOU, etc., have been signed.																

### 2-3-3. Output 3: Role of CEMASTEА is strengthened as resource centre for Mathematics and Science education in Africa

No significant achievements were observed in Output 3 of the WECSA Component according to the Review based on the verifiable indicators set in the PDM.

**Box: Expectation of the member countries toward Resource Center in CEMASTEА**

Following are the expected services of the resource center function of CEMASTEА (from mid-term review questionnaire respondents from member countries):

- Periodical training opportunity, technical exchange (including administrators) (extend topics to other than ASEI-PDSI)
- Teacher exchange program
- Publication (newsletter, and magazine)
- Research opportunity provision
- Monitor progress of INSET development in member country
- Scholarship
- Gate to international organization (e.g. member countries, RECSAM, Japan, Indonesia, Philippines etc. )
- Model laboratory
- Update on the latest developments in math and science and how to teach it in the classroom
- Library
- "e-SMASE WECSA" SNS, mailing list, etc.
  - Consultation
  - Information center (collect and archive to share)
  - on-line shop of educational material
- "Resource" includes (audio, visual, paper, material, etc)
  - Improvised sample material (incl. how to make it)
  - Model lesson and lesson plans
  - Experiment example
  - Training materials
  - Teaching and training kits"
  - Basic information on education system of member countries (syllabus, textbooks, teacher guides, education policy)
  - TCTP training report
  - Training program (recorded)

### 2-4. Achievement of Project Purpose

Project Purpose is "Capability of INSET providers to implement ASEI/PDSI based INSET in member countries is strengthened" and it is verified by the following indicators: Lesson Innovation Index (LII) and Capacity Building Index (CBI). Both indicators have already exceeded the targets set. As far as TCTP maintains its quality, it is most likely that scores of these indexes of the current definition shall be maintained too. Thus, it is reasonable to envisage that the Project Purpose will be achieved.

**Table 14: Project Purpose verifiable indicator**

Verifiable indicator of Project Purpose (PDM)	Achievement
Verifiable indicator (a) Lesson Innovation Index (LII) attains a mean of 2.5;	LII marked 3.04 (N=31)
Verifiable indicator (b) INSET providers obtain a mean of 2.5 on a scale of 0-4 in the overall assessment of Capacity Building Index (CBI) for INSET provision;	CBI marked 2.98 (N=31).

Target group of the data collection is ex-TCTP trainees, and this is a proxy of the beneficiary of the entire SMASE WECSA (which is not limited to TCTP).

## 2-5. Achievement of the Overall Goal

Achievement of the overall goal is measured by ASEI-PDSI practice index (API) and quality learning index (QRI). Though the mid-term review does not assess the overall goal (it should be assessed in the terminal evaluation), the following are provided by CEMASTEVA, compiled from the terminal evaluation reports of respective JICA technical corporation projects in member countries.

**Table 15: Project overall goal verifiable indicator**

Verifiable indicator of the Overall Work(PDM)	Achievement
(+) ASEI-PDSI practice index (API) of trained teachers exceeds those of un-trained.	<u>a-1 Nigeria</u> 3.0-3.7 (trained teachers) 1.7-1.9 (untrained teachers) <u>a-2 Rwanda</u> 1.3-2.0 <u>a-3 Niger</u> 0.67-2.28 (trained teacher) 0.67-0.87 (untrained teacher)
(b) Quality of learning index (QRI)	<u>b-1 Nigeria</u> 3.5 (student taught by trained teachers) 2.5 (student taught by untrained teachers) <u>b-2 Rwanda</u> some positive observation: “more students are interested in the contents of the lesson and ask questions actively in class” and “more group work” <u>b-3 Niger</u> 0.4-2.29 (student taught by trained teacher) 0.4-0.8 (student taught by untrained teachers)

Source: “Information for mid-term evaluation 2011” (p.84-86)

## 2-6. Changes of Precondition and Important Assumptions of the Project

An important assumptions of the Project is: Member countries have or will have plans of improving

## Mathematics and Science Education at the basic level.

There have been no changes in the preconditions. Math and science education is one of the primary areas of focus for African nations both individually and collectively. Among 19 member countries that presented country report to the 10<sup>th</sup> WRC, 17 of them reported that their government already have some form of policy on INSET of math and science teachers.

### 3. Implementation Process

#### 3-1. SMASE WECSA association and CEMASTEА

##### 3-1-1. SMASE WECSA association

The administration organization structure (Joint Coordination Committee (JCC), National Planning Committee (NPC), etc.) of WECSA component is same as the Kenya Component.

WECSA association is a group of African countries pursuing strengthening mathematics and science educators through in-service training (INSET), pre-service training, research, and exchange of information, seminars, joint exercises and all other lawful means to pursue its objectives. There are 27 member countries and 7 observer countries as of November 2011. Chair, vice chair, secretariat and treasurers are elected and the secretariat shall be at the headquarters and is located in CEMASTEА.

**Table 16: Steering committee, WECSA Association**

	Name	Position
1	Mr. Edward TINDI	Chairperson SMASE-WECSA, Zambia.
2	Prof. Sarifa Fagilde	Vice Chairperson SMASE-WECSA (Lusophone) / Advisor to the Minister, Ministry of Education and Culture, Mozambique
3	Mr. Adama Faye	Vice Chairperson SMASE-WECSA (Francophone) /Director, Monitoring and Evaluation of Education Projects, Ministry of Education, Senegal
4	Ms. Cecilia NGETICH	Secretary SMASE WECSA /Director CEMASTEА
5	Mr. Keiichi Naganuma	Treasurer SMASE-WECSA / Chief Advisor SMASE Project

Source: "Information for mid-term evaluation 2011" (p.101)

CEMASTEА maintains good communication with international organizations through WECSA component activities. These are assets and the foundation for the WECSA component to maintain its multilateral operation.

- Association for development of education in Africa (ADEA): WECSA component composes activities of the working group on mathematics and science education (WGMSE), of ADEA.
- AU (African Union): CEMASTEА was invited to COMEDAF IV meeting (November 2010) and has gained positive recognition by the participants.

### **3-1-2. Growing senses of ownership among the member countries.**

The Review observed a rising sense of ownership among the member countries of the association. Suggestions by the member countries include: (1) CEMASTEAM to invite TCTP lecturers from member countries, (2) member countries to second its personnel to Nairobi to take part in WECSA component activities, and (3) raise membership fee to make the member countries more serious and be committed to the WECSA association activities.

## **3-2. Appropriateness of activities implemented**

### **3-2-1. TCTP**

TCTP is currently provided in three areas, namely, primary for Anglophone, secondary for Anglophone, and secondary for Francophone. TCTP, in general, has been appropriately provided as an induction course of the ASEI-PDSI. The program has evolved through continuous improvement and adjustment from the time preceding SMASSE Phase 2. According to the questionnaires and interviews, TCTP trainees are satisfied with the program as it is an eye-opening opportunity to be exposed to knowledge and practices of ASEI-PDSI. It also provides intellectual and professional excitement and stimulation through collaboration with INSET professionals from the region.

Meanwhile, a challenge commonly understood among CEMASTEAM staff is that TCTP needs more quality monitoring, by improving needs assessments and follow-up of trainees. Also the Review observed that, at this moment, the provision of intermediate and advanced courses for ex-participants of TCTP is rather limited, particularly for secondary and francophone courses. Meanwhile, the Review noted that there are needs for intermediate and/or advanced courses among ex-TCTP trainees who once attended TCTP, gained experience in the field, and are now facing new challenges.

#### **Box: Trainee's perception**

##### **What TCTP contents are applicable to member country TCTP? How TCTP could do more?**

TCTP participants in general are satisfied with their TCTP experiences. In general TCTP is an eye-opening experience of exposure to ASEI-PDSI both in knowledge and practice. Encountering colleagues from other African nations is another unique, attractive feature of TCTP.

TCTP currently is the fundamental and indispensable activity of SMASSE-WECSA administered at CEMASTEAM, and it will continue to be so as needs for ASEI-PDSI induction course. Here are results from the questionnaire survey conducted during the mid-term review.

[Trainee's Satisfaction]

"What knowledge that you obtained in TCTP (in Nairobi) can be well applied/applicable in your country?"



**Box: Trainee's perception**  
**What TCTP contents are applicable to member country TCTP? How TCTP could do more?**

### **3-2-2. TCE**

TCE too is much appreciated among the member countries, as it provides a quality expert service related to ASEI-PDSI and INSET upon request. For the beneficiary countries, TCE was an indispensable part of commencing their INSET programmes. Meanwhile, some issues are noted in the Review as follows;

- (1) Dispatch of TCE has declined recently. It seems demands of the member countries have been satisfied as (1) there are a number of ex-TCTP trainees in member countries, and (2) most of the projects supported by JICA Technical Corporation in INSET have completed its inception stage in the member countries.
- (2) Feedback on TCE services from beneficiary countries is limited. Feedback on dispatched TCE is not systematically provided to CEMASTEAM for further improvement of its services.

The following are also noteworthy comments from member countries:

- (1) Limit of current TCE expertise: current TCEs (or CEMASTEAM experts) are competent in ASEI-PDSI dissemination but consultancy skill is yet to be enhanced, borrowing the words by an interviewee. Member countries expected TCE to observe the lesson practice first before starting workshop/lecturers, rather than jumping into the workshop and explaining ASEI PDSI without visiting a school to observe a class<sup>2</sup>.
- (2) It needs to be careful to send Kenyan TCE to some countries where INSET provider would “just swallow what Kenyan TCEs explain without chewing and tasting it”. If it is the case, sending Japanese experts would be better option so INSET providers to more critically examine ASEI-PDSI.

### **3-2-3. WRC**

WRC is conducted in conjunction with WECSA annual delegate meetings. Member countries report their progress of INSET implementation to share the issues and solutions. By its nature, WRC agenda needs to accommodate annual reports from the member countries, while some participants

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<sup>2</sup> TCE may not be able to change the schedule to visit the school first before providing consultancy services after the arrival to the beneficiary countries as all the arrangements have been made. Therefore, it is critically important for TCE to develop a schedule with the beneficiary country before arrival.



consider it is too monotonous according to the interviews and questionnaires. Among personnel with such opinions, there is an expectation to shift WRC from a ceremony to a good mix of ceremony and technical discussion. Furthermore, they expect more opportunities to attend technical workshops which focus on addressing emerging needs from the ground.

Box: Opinion from the member countries on WRC

(+) There is an expectation to shift WRC from a ritual celebration to a good mix of ritual celebration and technical discussion (interview)

(+) TW is responding to emerging needs of technical discussion.

(-) Following are pointed out as issues to be improved regarding WRC

- Duration is too short
- Dominated by "formal discussion", and no opportunity for topic-specific technical discussion.
- It is monotonous
  - Same problems are raised every year. Resolutions are not implemented by most countries.
  - No indication of which country made what progress compared to last year.
  - Participants are those with no authority so cannot make decisions, conference decisions are not binding in member countries.
  - Participants from member countries change every year so no continuous and responsible engagement to the association activities.
- Expected some real examples of "improvised" material to be distributed, but it did not happen.
- Presentation opportunity is given only to a few countries.
- Language: Barrier to francophone and lusophone countries.

## 4. Review by the DAC Five Criteria

### 4-1. Review by of the DAC Five Criteria

Results of the evaluation by means of the five criteria are summarized below.

#### 4-1-1. Relevance: High

WECSA component is very relevant to the needs and policies of African nations as indicated by that: (1) African Union prioritizes mathematics and science education along with teacher development in its recent strategic paper “Second decade of education for Africa,” and (2) at the same time WECSA component composes activities of the working group of mathematics and science education of the Association for the Development of Education in Africa. It is also consistent with Japanese ODA/foreign policy for Africa indicated in the Tokyo International Conference on African Development IV (TICAD IV) commitments, and a recent policy of Ministry of Foreign Affairs “Japan’s Education Cooperation Policy 2011-2015.”

**Table 17: Evaluation on Relevance: High**

Item	Result	Findings
Necessity	High	(+) Positive. Math and science education is one of the primary areas of focus for African nations both individually and collectively, while teacher trainers supply is in shortage.
Relevance to the policies	High	(+) Among 19 member countries that presented country reports to the 10th WRC, 17 of them reported that their governments already have policies on INSET of math and science teachers in some form. (+) One SMASE-WECSA activity composes of working group activity of ADEA (Association of Development of Education in Africa). The working groups were created to devote more particular attention to relevant and topical issues for education in Africa. (+) Further, the Bureaus of Ministers of ADEA and COEMDAF (Conference of Minister of Education of the African Union) is now administratively integrated in accordance with the decision endorsed by the 10th African Union Summit in January 2008.
Relevance to Japanese ODA/Foreign policy	High	(+) Positive. It is relevant to Japanese ODA policies in Africa (+) ODA charter and mid-term ODA policy of Japan address that Africa and education are among the most prioritized areas. (+) Further, recent MOFA’s policy paper “Japan’s Education Cooperation Policy 2011-2015” and JICA’s position paper titled “JICA’s Operation in Education Sector” both set teacher education as the most prioritized area of cooperation. (+) SMASE (WECSA component) is mandated by TICAD IV Yokohama Action plan. The document set a plan to provide training program for a total of 100,000

Item	Result	Findings
Adequacy of the measures	High	<p>in-service teachers across Africa during 2008-2013, and SMASE (WECSA component) is indispensable to achieve the target.</p> <p>(+) it is adequate to provide training for INSET trainers of WECSA member countries in Kenya, with a reservation regarding medium language.</p> <p>(+) Kenya maintains a comparative advantage to other member countries including those which are francophone:</p> <ul style="list-style-type: none"> <li>• Kenya was an innovator in Africa that materialized a systematic INSET program as a routine activity of the government; and</li> <li>• Ensuing member countries were able to build their activities and materials upon Kenyan SMASSE experiences.</li> </ul> <p>(-) Trainees from Francophone and Lusophone countries faced difficulty in the TCTP taught in English with the use of a translator.</p>

#### 4-1-2. Effectiveness: High

Current activities and Outputs are effective to achieve the Project Purpose. It is envisaged that TCTP would continuously contribute to improving scores of the Lesson Innovation Index and Capacity Building Index for the rest of the project period. Therefore, it is reasonable to state that the Project Purpose is highly achievable.

**Table 18: Evaluation on Effectiveness**

Item	Result	Findings
General achievement of Project Purpose	High	<p>(+) The Project Purpose is going to be achieved given the inputs, activities and Outputs.</p> <p>(+) It is envisaged that LII and CBI would be maintained for the rest of the project period as there is no threat envisaged to dramatically degrade the quality of SMASE WECSA activities.</p> <p>(-) Meanwhile continuity of data collection of the verifiable indicator has some weakness – it is limited to post-event self-confidence of TCTP trainees as a proxy of WECSA beneficiaries.</p>
Causal relation	High	<p>(+) There is a causal relationship between Output and Project Purpose.</p> <p>(+) LII and CBI gauge how training makes an impact on the trainee (TCTP).</p> <p>(+) TCTP is a fundamental activity of WECSA component.</p> <p>(+/-)TCTP trainee is a proxy of the beneficiary (INSET provider) here.</p> <p>(+/-) With this proxy, Output 1 alone is directly related to the achievement of the Project Purpose. Therefore it is indispensable for the project to achieve its purpose.</p> <p>(+/-) Output 2 and 3 are supplemental. Activities under these Outputs will contribute to “enrich” the achieved capacity by providing WECSA services through non-training activities (TCE, RC, etc).</p>

#### 4-1-3. Efficiency: High

Although there is no significant progress made for Output 3, the Project has been implemented efficiently within the given time framework at CEMASTEAM where activities of both Kenya and WECSA components are carried out.

**Table 19: Evaluation on Efficiency**

Item	Result	Findings
Achievement of Outputs	Medium	(+) Output 1: High (+) Output 2: High (-) Output 3: Negative; no significant achievement recognized.
Positive and negative factor Output 3	Low	(-) CEMASTEAM is primarily an INSET center for Kenya, therefore SMASE-WECSA component tends to be less prioritized compared to Kenyan Component. (-) Library: CEMASTEAM broadly understand that there is no need to commence activities related to the Resource Center until the library construction is completed in 2013. (-) Invisible clients of the resource center. Unlike TCTP and other non-training activities (TCE and TW), clients of the RC have not been well defined therefore invisible to CEMASTEAM.
Result of Inputs	High	(+) Inputs are fully utilized yet there are some amounting tasks to be done. (+) The project has managed diversified activities to achieve various Outputs across the Kenyan and WECSA component of SMASE. (+) It also has managed to arrive at the point where the project can foresee the sustainable future of WECSA. Therefore needs to start detailed and continuous discussions and activity implementation to materialize it. (-) Meanwhile, dominant activities at CEMASTEAM are INSET for Kenya component (1Q-3Q) and TCTP and WRC for WECSA component (4Q). Project resources had to be shifted in accordance with the annual calendar of activities.
Cost	High	(+) Positive. SMASE WECSA is very much cost efficient. (+/-) On average an annual 50 million Kenyan Shilling (ksh) is budgeted for WECSA component activities, and it has been disbursed accordingly. (+/-) The total amount of JICA's operational cost was Ksh.151 million of which Ksh.42 million was allocated for the activities in Kenya. The remaining (Ksh. 108,556,258.94) is spared for WECSA activities. (+) If catering to the same size of the clientele with Japanese experts, cost would be bigger by one to two digit(s).

#### 4-1-4. Impact

Impact of WECSA component activities is not evaluated in this mid-term review.

#### 4-1-5. Sustainability: Mixed

Review result of the sustainability is “mixed”.

- Policy: MOE of Kenya mandates WECSA component activities as part of CEMASTEAs activities. Meanwhile, it has not been confirmed yet if such policy could be maintained without current JICA support.
- Technical: Technical sustainability, in other terms, expertise of the CEMASTEAs staff is sufficient enough to continue WECSA component activities. Expertise foundation is laid through a decade of corporation between Kenya and Japan, while continuous and sincere improvement is indispensable to catch up with the shifting needs across the member countries.
- Finance: No alternative funding has been confirmed other than JICA to run WECSA component activities.

**Table 20: Evaluation on Sustainability**

Item	Result	Findings
<b>Policy</b>	Medium	Kenyan ministry of education mandated that provision of WECSA activity is one of CEMASTEAs functions. It has not been confirmed yet if such policy could be maintained without current JICA support
<b>Institutional</b>	Medium	(+) SMASE WECSA constitution and CEMASTEAs strategic plan mandate SMASE WECSA activities as a part of its roles and functions (-) Yet, some CEMASTEAs staff does not seem to feel ownership of administration of WECSA activities (TCTP, WECSA regional conference, and TCE dispatch) administration, probably due to that most of the budget for WECSA activities administered at CEMASTEAs is covered by JICA
<b>Organizational</b>	Medium	(+) Organizational structures of SMASE WECSA (the association, secretariat and committee) are configured well and clarified by the constitution. (-) Many organizations are involved in WECSA component at CEMASTEAs.
<b>Financial</b>	Not applicable (N.A)	(+) Center is administratively capable to handle funds for WECSA activities. (-) SMASE WECSA component activities are not affordable by both MOE and the center. (-) No alternative funding has been confirmed. (-) Financial sustainability seems not to be an appropriate criteria to review MOE/CEMASTEAs in WECSA component. WECSA component activity is a multilateral activity and it is not appropriate to assume GOK would finance this multilateral activity in the future
<b>Technical</b>	Medium	Technical: Technical sustainability, in other terms, expertise of the CEMASTEAs staff is sufficient enough to continue the current service

Item	Result	Findings
		line-up of WECSA component. The foundation of their expertise is already laid, while they need to improve their skills and knowledge continuously to catch up with shifting needs of INSET across the member countries.

## 4-2. Positive and Negative factors

The following issues were identified as positive and negative factors in the planning and implementation of the Project.

### 4-2-1. Positive Factors

There are several driving forces of the Project including:

- (1) Steady and robust demands for training and other opportunities on ASEI-PDSI knowledge and practices,
- (2) Professional dedication of the CEMASTEAM staff to promote ASEI-PDSI ideas, and
- (3) Strength of the flexible management in collaboration between CEMASTEAM and the JICA experts.

### 4-2-2. Negative Factors

There are several impediments considered related to the overall WECSA component and its Output 3 (function of CEMASTEAM as a resource centre):

- (1) CEMASTEAM prioritizes Kenyan INSET during the 1st – 3rd quarters of the calendar year, and TCTP and annual WRC are in the 4th quarter, while TW and TCE can be implemented anytime of the year upon the request from the beneficiary countries. With this time frame, TCTP and WRC needs to be planned, implemented and evaluated within 3 months, and TW and TCE need to be conducted in parallel to other on-going activities. This limits time allocated for CEMASTEAM staff to discuss through the plan beforehand and carefully evaluate the implementation afterwards. Eventually, the programme, such as WRC, has become rather monotonous being replicated from the previous practices, while efforts have been made for continuous improvement.
- (2) Potential clients have not been specifically determined for the function of CEMASTEAM as a resource centre. This hindered CEMASTEAM to promote activities under Output 3.

## 5. Conclusion

The Review concluded the Project has made reasonably good progress. The Review also found that CEMASTEА has a distinct position from other similar INSET institutions in the region, while the numbers of competitive INSET providers are gradually increasing. For CEMASTEА to uphold its distinct position, it is crucial to (1) maintain “one step ahead of others” through continuous and sincere improvement of its technical expertise and activities, and (2) to shift its domain of activities from just “providing training” to “leading collaboration”, reflecting the shifting demands and expectations of member countries.

For CEMASTEА, continuous and serious improvement of the personnel and program is important more than ever to maintain its “distinct” position among the member countries. SMASE-WECSA has been successful in promoting ASEI-PDSI and it has managed to arrive at a point where CEMASTEА is regarded as a distinct INSET institution in Africa “with respect and admiration”, borrowing a phrase heard in an interview during the mid-term review. On the other side of the coin, CEMASTEА is now having potential “competitors” in the SMASE WECSA association. Their INSET trainers have gained skills and knowledge from SMASE-WECSA activities, and now many countries have started to consider that they might not need services/assistances from CEMASTEА in the future, if the quality and focus remain the same.

For SMASE-WECSA, there is the momentum to shift its activity domain from “training” to “collaborating (facilitation)” for in-service teacher professional enhancement. Some member countries are interested to participate in TCTP as trainers and in the WECSA committee as committee members. Also some member countries have gained strength in a specific area, which is a healthy indication of their development (e.g. lesson study practice of Zambia INSET provider). Thus, with this combination of motivation and technical capacity, SMASE-WECSA is shifting towards making efforts to collaborate for in-service teacher professional enhancement.