



ASEI and PDSI

SMASE - WECSA ASSOCIATION 10th Anniversary



*A Decade of Promoting Mathematics and Science
Education for Teachers and Learners*

Foreword



Edward Tindi

SMASE-WECSA Association which stands for Strengthening of Mathematics and Science Education in Western, Eastern, Central and Southern Africa was borne out of a regional conference held in Nairobi-Kenya hosted by SMASSE-Kenya in February 2001. This was out of the recognition that challenges in the teaching and learning of mathematics and science cuts across curricula in African continent.

In an effort to realize our objective of Improving Classroom Activities for Quality Teaching and Learning of Mathematics and Science in Africa through Pre-service and In-service Education Training (INSET), research, exchange of information seminars and conferences, joint activities and all other lawful means, CEMASTEAM-Centre for Capacity Development and member countries have been challenged. The outcome has been initiation of projects in member countries in order to realize the two main thematic areas.;

1st to establish INSET systems in their respective countries,

2nd to develop activities that enhance classroom practice.

The 10 years have not been easy. There have been moments of frustrations. The founding fathers and mothers have come and gone, two steps forward have resulted in one step backward so as to accommodate old and new and move. As the saying goes; A thousand Kilometers journey starts with a first step. That first step has been made and as we forge ahead we take stock through reflection so that we can have moments to celebrate achievements. The obstacles being faced urge us to forge ahead and successes motivate us because we are all convinced that there is bright sunshine at the end of the tunnel. Faith of what we have embarked on keeps us going.

In celebrating our 10th Anniversary I wish to extend our gratitude to the Government of Japan through JICA for championing the SMASE – WECSA Cause through the 3rd and 4th Tokyo International Conference on African Development (TICAD III & IV) and Government of Kenya for hosting the SMASE-WECSA Secretariat and establishing CEMASTEAM to fulfill its mandate as a regional INSET Centre of Excellency for mathematics and science education. I wish to extend further our gratitude for the collaborative links with strategic institutions like Association for Development of Education in Africa (ADEA) and partnerships with organizations like New Partnership for Africa's Development (NEPAD) through the Consolidated Science & Technology Plan of Action of the African Union. SMASE-WECSA will not be doing justice to itself for not thanking the African governments through the Ministries of Education for the commitment and support rendered and continue to render financially and human resource.

On behalf of SMASE-WECSA, I salute you all the stakeholders for the commitment and resilience despite the numerous challenges of inadequate infrastructure in the face of MDGs, attitude and limited resources to fully equip our science laboratories and other related specialized rooms.

**God Bless,
Edward Tindi,
Chair, SMASE-WECSA Association**



Mission Statement

The SMASE-WECSA association shall exist for the purpose of Strengthening Mathematics and Science Education at the basic level, through in-service training (INSET), pre-service training, research, seminars, joint exercises, exchange of information and all other lawful means to pursue its objectives.

Key Objectives

The objectives of SMASE-WECSA association include:

- To uplift the standards of teaching and learning of Mathematics and Science Education in member countries, thus enhancing performance of these subjects within these countries
- To promote the formation and growth of country associations by making available relevant information to member countries
- To facilitate establishment of links amongst member countries through communication, networking, exchange of training materials and initiating regional meetings when necessary
- To offer advice to member associations/bodies on matters of training and exchange of resource personnel
- To enhance professional interaction and exchange of ideas amongst Mathematics and Science educators
- To enhance classroom activities for quality teaching and learning of Mathematics and Science
- To develop teaching and learning materials for Mathematics and Science, publish journals and newsletters, and exchange such materials amongst its members and within the region

Partners

- Japan International Cooperation Agency (JICA); <http://www.jica.go.jp>
- Ministry of Education, Kenya; <http://www.education.go.ke>
- CEMASTE A
- New Partnership for Africa's Development (NEPAD); <http://www.nepad.org>
- Association for the Development of Education in Africa (ADEA); <http://www.adeanet.org>
- RECSAM; <http://www.recsam.edu.my/>
- 24 full member and 10 observer countries

- To liaise with related government departments and other organizations for achievement of the association's objectives
- To solicit for and provide materials and/or financial support, including donations to finance projects and programmes and furtherance of the development of Mathematics and Science in Africa.

Major Activities

- Capacity building
- Advocacy
- Monitoring and Evaluation
- Knowledge networks
- Dissemination and Communication of Information
- Research

Members Countries

Paid Up Members (24 Countries)

Angola, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe

Unpaid Members (10 Countries)

Benin, Congo, Côte d'Ivoire, Egypt, Madagascar, Mali, Mauritius, Namibia, Seychelles, South Africa

Benin, Mali and Namibia - *Application to be fully paid up members is in the process.*



Year/Photo	WECSA Conference/Theme	Major Events
<p>2001</p> 	<p>The 1st Regional Conference</p> <p>Venue: February 2001 in Nairobi, Kenya Theme: Mathematics and Science Education: Enhancing Classroom Activities for Quality Teaching and Learning in Eastern, Central and Southern Africa Region.</p> <p>Participant Countries (11 African Countries): Kenya, Lesotho, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe (Observer: Japan)</p>	<p>JICA had started MSE Projects in Kenya, Ghana and South Africa. Ghana, Malawi, South Africa, Uganda, Tanzania and Zambia had been visited and the experiences lead to an increased desire by the Project to share with other countries within the region and to find a common strategy to tackle the complex issues inculcating a scientific mind to the region's young people.</p>
<p>2002</p> 	<p>The 2nd Regional Conference</p> <p>Venue: June 2002 in Nairobi, Kenya Theme: Enhancing Classroom Activities for Quality Teaching and Learning in Eastern, Central and Southern Africa Region.</p> <p>Participant Countries (13 African Countries): Burundi, Ghana, Kenya, Lesotho, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe (Observer: Japan and Philippines)</p>	<p>The Government of Japan committed further assistance for African Capacity Development through MSE during WSSD held in Johannesburg, South Africa in August 2002. This initiative, was to seek to strengthen and expand the existing Regional Network (SMASSE – WECSA), thereby contributing to the expansion and enhancement of science and mathematics education in Africa.</p> <p>The constitution for the Association was ratified. The Regional Association later registered as SMASSE-WECSA Association in 2002</p>
<p>2003</p> 	<p>The 3rd Regional Conference</p> <p>Venue: June/July 2003 in Accra, Ghana Theme: Enhancing Classroom Activities for Quality Teaching and Learning in Africa.</p> <p>Participant Countries (18 African Countries): Burundi, Egypt, Ghana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe (Observer: Japan and Philippines)</p>	<p>SMASSE Phase 2 commenced with PDM including technical assistance activities for WECSA Members</p>
<p>2004</p> 	<p>The 4th Regional Conference</p> <p>Venue: May/June 2004 in Mpumalanga Province, South Africa Theme: Enhancing Classroom Activities for Quality Teaching and Learning in Eastern, Central and Southern Africa Region.</p> <p>Participants Countries (21 African Countries): Botswana, Burundi, Egypt, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe (Observer: Japan and ADEA Secretariat)</p>	<p>Training Programme for WECSA Members on ASEI/PDSI introduction (TCTP) launched in CEMASTEAM.</p> <p>Malawi: SMASSE INSET Project NEPAD: Signed LOU with CEMASTEAM NISMED: Started training programme for Kenyan MSE known as District Trainers in Philippines</p>
<p>2005</p> 	<p>The 5th Regional Conference</p> <p>Venue: June 2005 in Gitarama, Rwanda Theme: Enhancing Classroom Activities for Quality Teaching and Learning in Eastern, Central and Southern Africa Region.</p> <p>Participants Countries (27 African Countries): Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cote d'Ivoire, Ethiopia, Egypt, Ghana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe (Observer: Japan, Philippines and ADEA Secretariat)</p>	<p>Kenya: ADEA-WGMSE Launched Uganda: SESEMAT Project Zambia: SMASTE Project Ghana: INSET Policy Project</p>



Major Events	WECSA Conference/Theme	Year/Photo
<p>Nigeria: SMASE Project Niger: SMASSE Project Mozambique: MSE INSET Project Kenya: TCTP for francophone speakers started in CEMASTE.A.</p>	<p>The 6th Regional Conference</p> <p>Venue: May/June 2006 in Saly, Senegal Theme: Enhancing classroom activities for quality teaching/learning of Mathematics, Science and Technology in Africa.</p> <p>Participants Countries (27 African Countries): Benin, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gabon, Gambia, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar, and Zimbabwe (Observer: Japan, Malaysia, Philippines and ADEA Secretariat)</p>	<p>2006</p> 
<p>Senegal: PREMST Project AU Commissioner in charge HRD made a visit to CEMASTE.A. WB Education specialist paid a visit to CEMASTE.A.</p>	<p>The 7th Regional Conference</p> <p>Venue: June 2007 in Lusaka, Zambia Theme: Enhancing Classroom Activities for Quality Teaching and Learning of Mathematics, Science through Lesson Study.</p> <p>Participants Countries (23 African Countries): Angola, Benin, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar, Zimbabwe (Observers: Japan, Madagascar, South Africa, Malaysia, Philippines and ADEA Secretariat)</p>	<p>2007</p> 
<p>Rwanda: SMASSE Project Burkina Faso: SMASE Project Uganda: SMASSE Phase 2 Malawi: SMASSE Phase 2 Zambia: SMASTE-CPD Phase 2 RECSAM: Started offering training course for INSET Trainers from WECSA Member countries.</p>	<p>The 8th Regional Conference</p> <p>Venue: May 2008 in Nairobi, Kenya Theme: Successful and Sustainable SMASE-WECSA Association for Better Teaching and Learning of Mathematics and Science in Africa.</p> <p>Participants Countries (21 Countries): Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Kenya, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Southern Sudan, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe (Observer: Japan, South Africa, Malaysia, Philippines and ADEA Secretariat)</p>	<p>2008</p> 
<p>Kenya: SMASE Project Angola & Tanzania: In Country Training Programme started Swaziland: WECSA Technical Workshop on Lesson Study Southern Sudan: SMASSESS Project launched Ghana: INSET Management Project</p> <p>The 1st Technical Workshop Venue: May 2009 in Mbabane, The Kingdom of Swaziland Theme: Enhancing Classroom Activities for Quality Teaching & Learning through Lesson Study Participants Countries (14 Countries): Swaziland, Botswana, Ethiopia, Ghana, Kenya, Mozambique, Nigeria, Rwanda, Tanzania, Uganda, Zambia, Malaysia, Philippines and Japan Uganda 1st International Workshop (2009) Venue: March 2009 in Kampala, Uganda Theme: Learner-Centered Approach in the Teaching and Learning Process Participant Countries (7 Countries): Uganda, Japan, Kenya, Malawi, Nigeria, Rwanda and Zambia</p>	<p>The 9th Regional Conference</p> <p>Venue: November 2009 in Nairobi, Kenya Theme: Successful and Sustainable INSET Activities and Government Support for Quality Teaching and Learning.</p> <p>Participants Countries (20 African Countries): Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Kenya, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Southern Sudan, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe (Observer: Benin, Japan, South Africa and ADEA Secretariat)</p>	<p>2009</p> 
<p>Niger: SMASSE Phase 2 Botswana: M&E Workshop invited several WECSA members and Kenyan facilitators</p> <p>Zambia 1st Technical Workshop (2010) Venue: February 2010 in Central Province, Zambia Theme: Realizing Problem Solving Approach in African classroom Participant Countries (6 Countries): Zambia, Japan, Kenya, Nigeria, Rwanda and Uganda</p> <p>Uganda 2nd International Workshop (2010) Venue: March 2010 in Kampala, Uganda Theme: Capturing Learner's Idea. Participant Countries (8 Countries): Uganda, Ethiopia, Ghana, Japan, Kenya, Nigeria, Rwanda, and Zambia</p>	<p>The 10th Anniversary Regional Conference</p> <p>Venue: December 2010 in Nairobi, Kenya Theme: A Reflection on a Decade of Promoting Mathematics and Science Education in Africa.</p> <p>Participating Countries (26 African Countries): Angola, Botswana, Burkina Faso, Burundi, Cameroon, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Mali, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Southern Sudan, Swaziland, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe (Observer: Benin, Japan, South Africa and ADEA Secretariat)</p>	<p>2010</p> 

* Highlighting on the country shows new country to the conference to that year



Networking of Good Practices in

Uganda



Secondary Science and Mathematics Teachers National Expansion Plan (SESEMAT NEP) [Phase 1: Aug 2005-Aug 2008, Phase 2: Aug 2008-Aug 2011]
There is a slight improvement in Uganda Certificate of Education in M&S last year. More students have opted for science combinations at Advanced level.

Senegal



Kenya



INSET system for 20,000 Secondary MS Teachers established with National INSET Centre (CEMASTEA) by successful implementation of SMASSE Project.
SMASSE Project targets 60,000 Primary MS teachers trained on ASEI/PDSI approach and further capacity development for CEMSTEA.

Rwanda



Strengthening Mathematics and Science in Secondary Education Project (SMASSE Rwanda) [Feb. 2008-Jan. 2011]
Increase in the number of students who choose M&S subjects as electives has been recognized. 70% of students entering in Public Higher Learning Institutions should do Science/Technology. (According to the Government Policy)
Attitude of teachers has changed as professionals.

Ethiopia



National Pilot Project for Strengthening Mathematics and Science Education in Ethiopia (SMASEE) [Start in Jan. 2011(expectation)]

Malawi

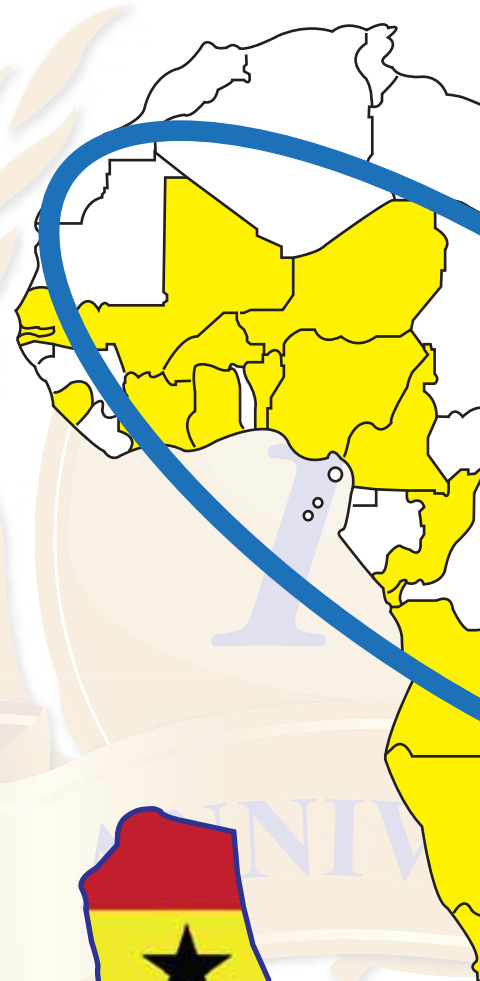


The Project on Strengthening of Mathematics and Science in Secondary Education (SMASSE INSET Malawi) Phase 2[Phase 1: Sep. 2004-Sep. 2007, Phase 2: Aug. 2008-Aug. 2012] There is improvement on students' performance in national examinations. The teaching and learning approach used in SMASSE has generated considerable interest in M&S among the students and more students are enrolling in the subjects for examinations.

Ghana



Project for Strengthening the Capacity of INSET Management (INSET Management Project) [Phase 1: Dec. 2005-Nov. 2008, Phase 2: Jun. 2009-Mar. 2013]
Teacher motivation to teach the subjects has been enhanced. Pupils' interest in M&S has increased based on their attendance in class and readiness to do projects.



SMASE - WECSA

selected countries within our network.

Senegal PREMST Project Phase I
Project period: three year pilot project
(2008-2010)

Target 10,310 elementary school
teachers in three pilot regions of
Louga, Fatick and Thiés out of the
11 regions in Senegal. 11 national
trainers offer training to 50 Regional
Trainers from the three pilot regions
who in turn train a total 345 local
trainers in their respective regions.

Project on Strengthening Mathematics and Science
in Secondary Education in Niger (SMASSE Niger)
Phase 2[Phase 1: Oct 2006 to Oct 2009, phase 2:
Mar 2010 to Sep 2013]Improvement of test results:
2006(11.93%), 2007(19.62%), 2008(30.6%),
2009(41.45%), 2010 (31.35%)



Niger

Burkina Faso

Project for Improvement of INSET Training of Math
and Science Teachers in Primary Education (SMASE
Project) Phase 2
[Phase 1: Jan. 2008-Jan. 2011,
Phase 2: Jan. 2011-Jan. 2015]



Zambia

Strengthening Mathematics, Science and
Technology Education (SMASTE) School-based
CPD Project Phase 2
[Phase 1: Oct. 2005-Oct. 2007, Phase 2:
Feb. 2008-Feb. 2011]The impact assessment
report indicates that there was a marked
improvement in general performance and also
in the quality of results for M&S from the time
the SMASTE project was introduced in Central
Province as compared to the non-target provinces.



Mozambique

Strengthening of Primary Education in Gaza
Province in Mozambique (MSE INSET Project)
[Jul. 2006-Jul. 2009]



Southern Sudan

Strengthening Mathematics and Science
Education in Southern Sudan (SMASESS)
[Nov. 2009-Dec. 2011]



Botswana

Project for Improvement of INSET Training of
Math and Science Teachers in Primary Education
(SMASE Project) Phase 2
[Phase 1: Jan. 2008-Jan. 2011,
Phase 2: Jan. 2011-Jan. 2015]



Nigeria

Strengthening of Mathematics
and Science Education in Nigeria
Project (SMASE Nigeria)
Phase 2[Phase 1:Aug. 2006-Aug.
2009, Phase 2:Jun. 2010-Jul. 2013]
Active participation of the children
during class lessons has been achieved.



How INSET impacts on Student

How INSET impacts on students

Innovative Lesson Pedagogy - ASEI-PDSI Approach

The ASEI-PDSI approach is an acronym for Activity, Student, Experiment, and Improvisation (ASEI) and Plan, Do See and Improve (PDSI). The approach endeavours to shift teaching and learning from knowledge-based teaching to **activity-based teaching**; teacher-centred teaching to **student-centred learning**; chalk and talk to **experiment** and **improvisation**.

ASEI-PDSI approach equips teachers for effective classroom practices, believing that the battle against poor performance in Mathematics and the Science must be won in the classroom. ASEI-PDSI is based on the premise that learners learn better when they are involved in the doing, through discussions, experiments and other activities, hence

the emphasis on the **learners as the central focus of learning**. This is in recognition of the fact that for a long time teaching in schools has predominantly been traditional where the teacher has been the centre of the learning process while current trends in education advocate for a learner centred teaching learning approach. Through INSET activities, teachers have been empowered with skills to develop innovative lessons through group planning, peer teaching, peer review and classroom practice in schools.

The overall goal is to improve the capability of learners in mathematics and science education primarily focusing on learning outcomes in mathematics and science. Through TCTP course at CEMASTEIA, over 1,000 educators from SMASE WECSA member countries have been trained on ASEI-PDSI approach which they are adapting in INSET activities in their home countries.

A
Activity

S
Student Centred

E
Experiment

I
Improvisation

P
Plan

D
Do

S
See

I
Improve



Achievement through ASEI - PDSI

SMASE Project Impact Assessment Survey (SPIAS)

The SMASSE Project Impact Assessment Survey (SPIAS) was conducted for 5 years from 2004 to 2008 in Kenya. The purpose of this study was to determine the impact of SMASSE INSET on the secondary school students' achievement in Mathematics and Sciences and factors that affect successful implementation of INSET. The study revealed that teachers' attendance of SMASSE INSET had a statistically significant effect on students' achievement test scores in mathematics and science. The major findings from this study were as follows:

- The students' capacity would be improved by "students' attitude to the subject, rather than by the direct effort of mastering the subject contents
- The Principal's encouragement of teachers affect in the improvement of teachers' teaching process

Further pathway analysis through SEM revealed a model for successful implementation of SMASSE INSET as shown in figure 2 below.

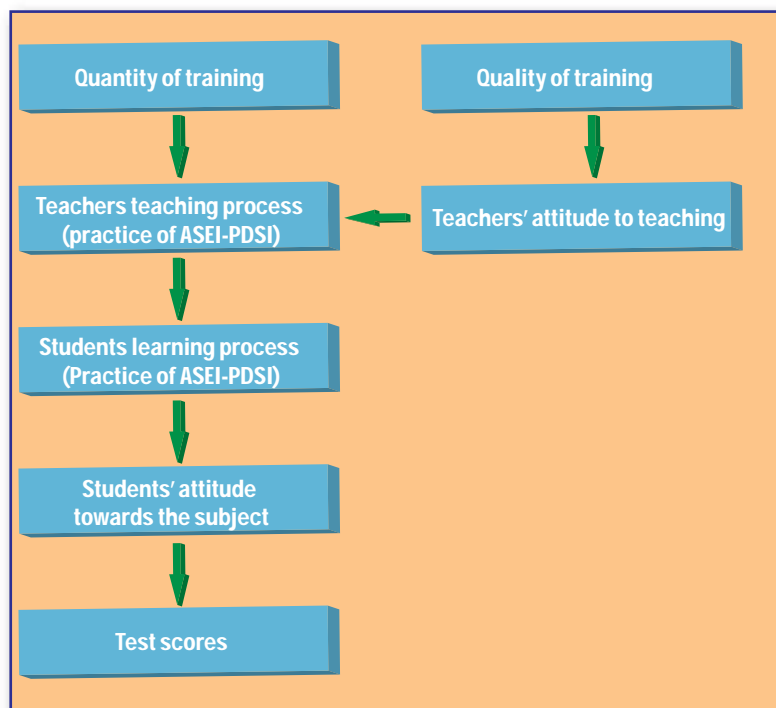


Figure 1:

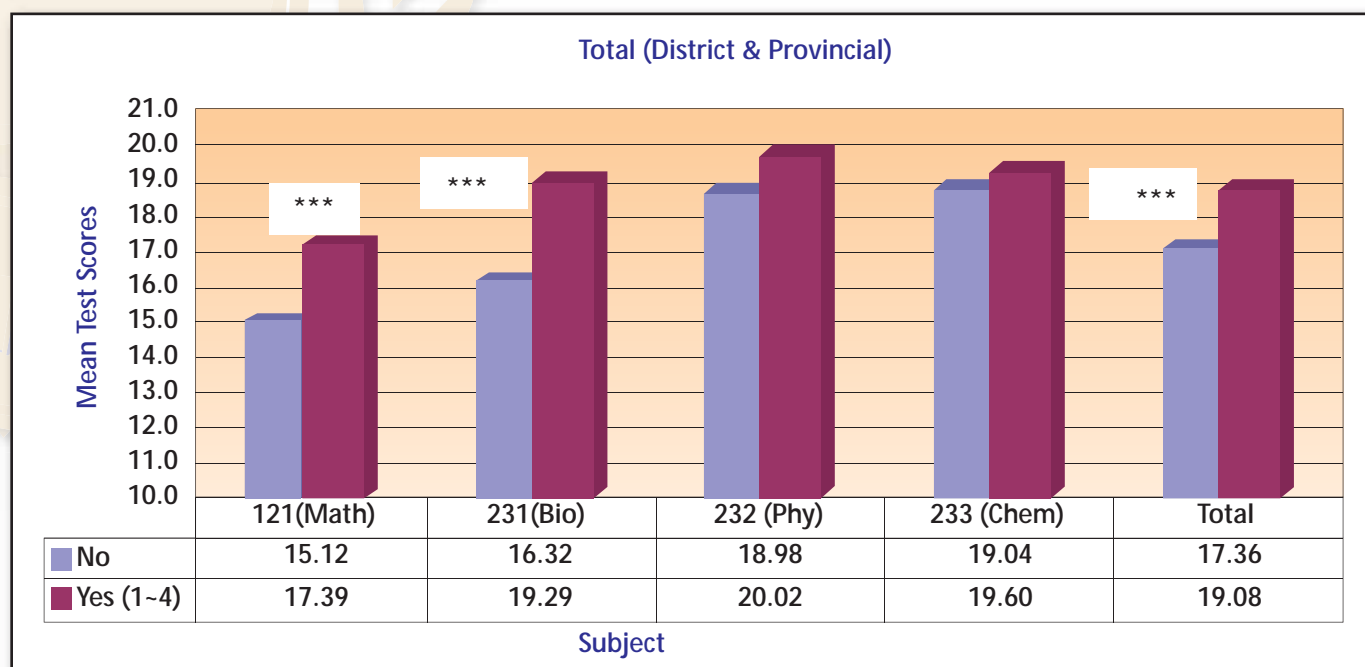


Figure 2

Each year a sample of about 6,000 students in Form 2 (grade 10), 600 teachers of mathematics and science and 150 principals of secondary schools were sampled from 150 schools in 10 districts spread across the country. The instruments used were: questionnaire for teachers, questionnaire for students, questionnaire for principals and an achievement test for students based on mathematics and science.



Role of CEMASTEA and

CEMASTEA, home of SMASE-WECSA, has been playing an important role as Technical Assistance Provider as well as the Secretariat to the SMASE-WECSA Association, since its inception. The institution has conducted and continues to conduct the following activities, with the support of Government of Kenya (GOK) and Japan International Cooperation Agency (JICA).

Regional Institution for Mathematics and Science Teacher Training

- HR/Facility for SMASE WECSA
- TCTP
- Technical Assistance (Capacity Development for Sub-Sahara Africa)
- SSC or ownership and leadership
- ADEA/AUC/Other DPs



TCTP participants in tryout session



TCTP group 16

Technical Assistance

From 2005, technical assistance services have been provided by CEMASTEA staffs to SMASE-WECSA member Countries. The countries that have so far benefited from this service include: Angola, Botswana, Burkina Faso, Ghana, Malawi, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda and Zambia. The technical assistance services that are offered include: project formulation, baseline and needs assessment studies, INSET curriculum design, development of training modules, monitoring and evaluation of projects, impact assessment studies and INSET management and facilitation.

Dispatch of Third Country Expert (Kenyan Staff and Japanese Expert)

Year	Country	Number of Staff
2005	4 Countries (Burundi, Malawi, Nigeria and Nigeria)	21
2006	6 Countries (Malawi, Niger, Nigeria, Rwanda, Tanzania and Uganda)	43
2007	11 Countries (Burkina Faso, Burundi, Ghana, Lesotho, Malawi, Niger, Nigeria, Rwanda, Senegal, Uganda and Zambia)	50
2008	13 Countries (Angola, Burkina Faso, Malawi, Niger, Nigeria, Rwanda, Sierra Leone, Senegal, Sudan, Swaziland, Tanzania, Uganda and Zambia)	64
2009	8 Countries (Angola, Burkina Faso, Niger, Nigeria, Rwanda, Senegal, Sudan and Tanzania)	18
2010	8 Countries (Angola, Burkina Faso, Niger, Nigeria, Rwanda, Senegal, Sudan and Tanzania)	20
TOTAL		216

Table 1



Third Country Training Programme (TCTP)

This programme was started in February 2004 and has taken place every year. In TCTP, the Theme of the course is “Activity, Student, Experiment, Improvisation and Plan, Do, See, Improve (ASEI & PDSI) Approach in Mathematics and Science Education in Africa”, CEMASTEAs conducts INSET for key trainers from WECSA member countries. This training programme, though centred on ASEI/PDSI, includes training in such key areas as sustainability, relevance, impact, efficiency and effectiveness of an INSET system. The education systems and curricula in the various countries involved may differ since they are tailored to suit their unique situations. The fundamental principles of this training is that participants should adapt the skills and knowledge acquired to suit their unique circumstances.

The Table below shows the TCTP courses that have been undertaken so far.

TCTP	Year/Month	No. of countries	Length of training	No. of Participants
TCTP 1	2004/Jan-Feb	7	5 weeks	42
TCTP 2	2004/Nov-Dec	15	5 weeks	85
TCTP 3	2005/Nov-Dec	14	5 weeks	95
TCTP 4	2006/Oct	11 (Anglophone)	4 weeks	81
TCTP 5	2006/Nov-Dec	6 (Francophone)	4 weeks	83
TCTP 6	2007/Sep-Oct	6 (Anglophone)	4 weeks	76
TCTP 7	2007/Oct-Nov	7 (Francophone)	4 weeks	67
TCTP 8	2008/Oct	12 (Anglophone)	4 weeks	83
TCTP 9	2008/Nov	3 (Francophone)	2 weeks	31
TCTP 10	2008/Nov	7 (Anglophone)	3 weeks	50
TCTP 11	2009/Sep-Oct	10 (Anglophone)	4 weeks	76
TCTP 12	2009/Oct	3 (Francophone)	2 weeks	31
TCTP 13	2009/Oct-Nov	7 (Anglophone)	3 weeks	52
TCTP 14	2010/Sep-Oct	12 (Anglophone)	4 weeks	82
TCTP 15	2010/Oct-Nov	7 (Francophone)	2 weeks	30
TCTP 16	2010/Oct-Nov	10 (Anglophone)	3 weeks	50
TOTAL				1,014

Table 2



Special Training Course for WECSA Member Countries (No. of Participants)

In addition to TCTP, CEMASTEAM has been conducting Special Training/WS for WECSA member countries since 2005.

Course	Year/Month	Country	Length of Training/WS	Number of Participant
OJT for National Trainer, SESEMAT Project	2005/Aug-Sep	Uganda	4 Weeks	4
OJT for National Trainer, SESEMAT Project	2005/Dec	Rwanda, Sudan, Southern Sudan, Zambia	2 Weeks	72
Project Formulation WS	2006/Jan	Niger	2 Weeks	3
OJT for National Trainer, SESEMAT Project	2006/Aug-Sep	Uganda	2 Weeks	8
OJT for National Trainer, SMASE Project	2006/Aug-Sep	Nigeria	4 Weeks	4
OJT for National Trainer, SMASE Project	2006/Sep	Nigeria	2 Weeks	12
Introduction of ASEI/PDSI	2006/Nov	Malawi, Sudan, Southern Sudan, Zambia	2 Weeks	60
Introduction of ASEI/PDSI	2007/Aug	Sudan, Southern Sudan	2 Weeks	31
INSET Curriculum Design	2007/Oct	Tanzania	1 Week	2
INSET Curriculum Design	2007/Oct-Nov	Lesotho, Swaziland	2 Weeks	10
Introduction of ASEI/PDSI	2009/Jan-Feb	Southern Sudan	4 Weeks	74
WS for INSET System in Kenya	2009/Feb-Mar	Senegal	1 Week	17
WS for INSET System in Kenya	2009/Mar	Mali	1 Week	9
Total				306

Table 3

Lesson Learned from Japan's Case

INSET for Professional Capacity Development

The strengthening of in-service training, with the aim of supporting the qualitative upgrading of teachers, is an ongoing aim in Japan. Before 1940, there was no legal or regulatory backing for in-service training, and any training that existed was on an ad hoc basis, taking such forms as observation of classes at a school attached to a Normal School, participation in lecture meetings organized by the administration, or attendance at public research study meetings arranged by local schools. Nowadays, however, against the background of the growing sophistication and diversification of education that have accompanied turbulent and rapid social change, with the aim of enabling teachers to respond to social demands and to changes in the roles of teachers and schools, the current tendency is to put increasing weight on the importance of undertaking in-service training after the initial appointment, and many different kinds of training are now carried out on an everyday basis. Taking part in in-service training is an obligation for teachers, and at the same time, the legal right to take part in such training is specified in the "Law for Special Regulations concerning Educational Public Service Personnel," and there are provisions to ensure that this right is adequately guaranteed. Characteristic examples of in-service training, with a specific explanation of the content, are given below.

- Training in Line with the Number of Years of Service as a Teacher
- Training Matched to Professional Ability
- School-based Training

Main Organizer	Kinds of Training	Example
Central Government	Training to develop teacher leaders	Training for principals and deputy principals, training for core middle-level staff, ship-based training, overseas training, career guidance lectures, training seminars for teachers concerned with new industrial technology.
Boards of education in prefectures, designated cities, and core cities	Training geared to length of experience and professional ability	Training for newly appointed teachers, training for teachers with 5, 10, and 20 years of experience, training for teachers in charge of pupil guidance or those newly charged with administrative duties, subject-based training, etc.
Municipal boards of education	Training geared to the actual condition of cities, towns and villages	Training concerning conditions of service for municipal employees and personnel transfer, present situation and problem areas concerned with school lunches.
Schools	Attainment of school objectives, etc	
Individual Teachers	Self-study training for personal Elightment	

Table 4



Lesson Learned from Japan's Case

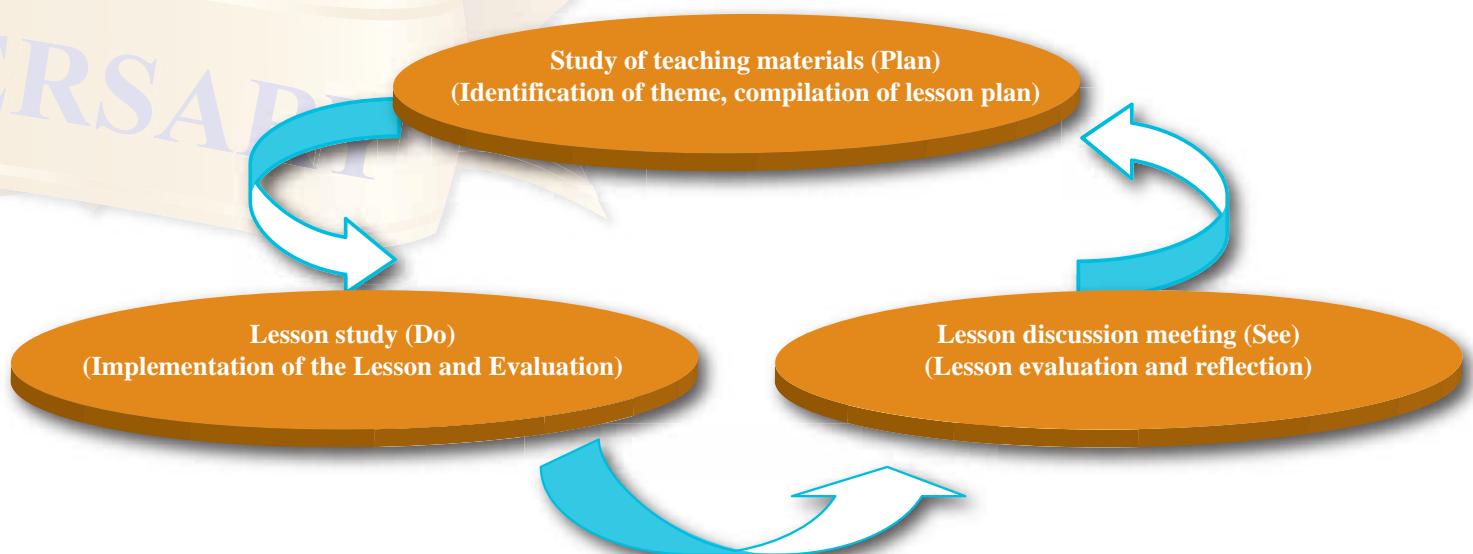
Lesson Study

Lesson study is a methodology denoting collaborative action by teachers to improve the quality of lessons. It is made up of three stages, namely the study of teaching materials, lesson implementation and reflection on the lesson, and can be implemented in various forms, for example, as part of school based training or within a framework organized by an academic society. It is worthy of note that it is quite commonplace in Japan to find teachers carrying out, on their own initiative, practice-based research concerned with their teaching, and spending their time engaged in trying to improve the quality of their daily teaching in the classroom.

Put simply, "lesson study" is research which has a lesson as its object. It has a number of characteristics, but the most important one is the "continuing study and research carried out by teachers in the course of their daily lessons as they seek to achieve the objective of raising the quality of their teaching." In Japan, educational guidelines are established by the Courses of Study, which in turn serve as the foundation for the production of textbooks. And lessons in turn are implemented on the basis of the textbooks. Courses of Study, as the concrete manifestation of national criteria, are fixed, but classroom "lessons" retain a high degree of freedom, and teachers are expected to decide how they will construct their lessons on the basis of the Courses of Study. Lesson study is a device that functions as a bridge linking the national criteria in the form of the Courses of Study with the classroom lesson, and it is eagerly implemented in Japanese schools.

Lesson study has come to play an important role in the accumulation and hand over of teaching skills as well as in the formation of the image of a teachers. In lesson study, a group of educationists, teacher colleagues, teacher advisors, university professors, and so on, will assemble together, observe the lesson conducted by one teacher, and during the subsequent lesson discussion meeting, exchange opinions, and thereby deepen their own knowledge of teaching materials, children's learning, lesson composition and so on. This kind of lesson study is very popular in Japan, and recently too, every teacher teaches a class in front of colleagues once a year. Teachers who do this learn from each other, and by means of the repetition of the process of finding solutions to educational issues through teaching in this way, the teaching skills of each teacher are shared among others, and at the same time, a common pattern of thinking with regard to teaching and learning is formed among teachers.

Furthermore, at the time of carrying out the experimental lesson, the teacher constructs the lesson plan on the basis of the teaching materials that have in turn been the object of thorough study and examination, and implements the planned lesson. Within the framework of a lesson prepared in this way, there are a significant number of occasions when novel teaching plans and teaching methods will be integrated into the lesson by the teacher and implemented in the course of the lesson. And in the lesson discussion meeting that follows the lesson, critical comments about the lesson will be made from many different angles, and points for improvement will become clear.



Message from the Director, CEMASTEA



Ms. Cecilia C. Ng'etich

SMASE WECSA association was established to strengthen mathematics and science education in Western, Eastern, Central and Southern Africa through In-Service Education and Training (INSET), Pre-Service Education and Training (PRE-SET), research, exchange of information, seminars and joint activities. The association is guided by the following key objectives:

- a) To enhance professional interaction and exchange of ideas amongst Mathematics and Science educators.
- b) To enhance classroom activities for quality teaching and learning of Mathematics and Science.
- c) To develop teaching and learning materials for Mathematics and Science, publish journals and newsletters, and exchange such materials amongst its members and within the region.
- d) To liaise with related government departments and other organisations for achievement of the association's objectives.
- e) To solicit for and provide materials and/or financial support, including donations to finance projects and programmes and furtherance of the development of Mathematics and Science in Africa.

Our activities are therefore focussed on five thematic areas: Capacity Building, Advocacy, Monitoring and Evaluation, Knowledge Networks, Dissemination and Communication of Information

CEMASTEA is the headquarters of the association and houses the secretariat that coordinates SMASE WECSA activities. Over the years, CEMASTEA has continued to capacity build educators across Africa through trainings in the Third Country Training Programme (TCTP) that to date has trained over 1200 educators in Africa on innovative teaching and learning in mathematics and science. With support from our partners, we will continue to offer and improve this training programme to make it more relevant to the needs of our clients. CEMASTEA has also continued to offer technical assistance services to countries that are implementing SMASE type projects for improvement of mathematics and science education.

As we celebrate 10 years of existence, it would be important to refocus and identify the successes and failures in the five thematic areas. While we may have done well in capacity building through training, we need to take stock of the impact of our activities. Therefore, there would be need to strengthen research, monitoring and evaluation to obtain regular feedback on our progress and identify the weaknesses of our programmes.

I would like to thank the member countries for their continued support to the association through participation in our joint activities and contributions. Likewise I would also like to acknowledge the Government of Kenya through the Ministry of Education and Government of Japan through JICA for their support in terms of human, financial and physical resources.

Ms. Cecilia C. Ng'etich
Director, CEMASTEA



CEMASTEA offices in Nairobi, Kenya



Message from Chief Representative, JICA -Kenya Office



Mr. Masaaki KATO

It is with satisfaction and joy that SMASE-WECSA commemorates its 10 years of successful and continuous Expansion of networking and cooperation for the strengthening of mathematics and science in Africa. The association was formed in 2001 after 3 years of successful piloting of ASEI/PDSI principles developed under SMASSE INSET Project in Kenya. The ASEI/PDSI, a motto and pedagogical principle, aim at changing both teachers and pupils attitude towards mathematics and science education (MSE) and making teaching and learning of MSE student-centred. With lessons learnt from SMASSE and the technical exchanges visits to 5 African countries, it was clear that African countries were experiencing similar problems and challenges in the teaching and learning of MSE. Need for concerted effort towards strengthening of mathematics and science education in Africa was felt necessary.

The association developed/adopted strategies that included JICA TCTP courses at CEMASTEPA, holding of annual regional conference besides technical assistance and exchanges among African countries in respect to application of ASEI/PDSI approaches.

The Government of Japan commitment at WSSD in 2002 to support networking on strengthening of MSE in Africa greatly boosted the drive and SMASE-WECSA membership growth. Through the effort of SMASSE Projects' Chief Advisor, Mr. Takahiko Sugiyama, his successor and colleagues, a lot of good work has been done towards establishing programmes in member countries for continuous professional development of teachers and application of ASEI-PDSI as a mean of strengthening MSE. JICA congratulates and thanks all member country governments and participants for their support, participation and general contribution that have sustained progress and growth of the association and its activities.

JICA, all the way through has appreciated the SMASE-WECSA effort and activities. These have also been recognized by ADEA, NEPAD and SEIA workshops which led to formation of ADEA Working Group on Mathematics and Science Education (WGMSE). The association's effort and work in general have been successful and effective to win international recognition as a practical and effective case of South South Technical Cooperation incapacity development. JICA is happy with the SMASE-WECSA activities and to have been associated and contributed in SMASE-WECSA interventions which aim at upgrading capability of Africans' youth in MSE which is a foundation of the most needed human resource in Africa.

This conference gives us an opportunity to reflect back on SMASE-WECSA past successes, shortcomings and challenges as an association and in our countries in regard to teaching and learning of mathematics and science in view of the required human resource for the national and regional social and technological development. JICA has helped train core staff for teachers' INSET in each of the SMASE-WECSA member countries. JICA therefore, urges member countries to make full use of knowledge, skills and lessons learnt since 1998 as each formulate the way forward. In this regards countries need to improve their policies on teacher education in view of strengthening and institutionalizing, INSET system that would make teachers more effective in curriculum delivery. With the accumulated experiences, the association's management committee and secretariat should aim at formulating programmes that respond and meet individuals (participants) and country's demand. Further, the association should strive towards strengthening this vital African network of educationists besides expanding its operations so as to involve more international organizations and agencies.

Mr. Masaaki KATO
Chief Representative JICA- Kenya Office



JICA Representative



Message from the Vice Chairperson (Francophone), SMASE-WECSA Association



Mr. Faye Adama

SMASE-WECSA is an initiative of African Countries whose main objective is to create a critical mass of skilled human resources in the fields of mathematics, science and technology in Africa. Everyone recognizes the importance of science and technology for sustainable economic development in Africa. Therefore, after 10 years of existence, it is now time to reflect on what we have achieved and at the same time diagnose the organizational and operational structure of the association.

To mark the 10th anniversary of SMASE WECSA, I would like to thank:

- a) Government of Kenya for starting this important initiative and for involving other African countries. The Government of Kenya through its Ministry of Education has spared no effort for the success of this initiative and has contributed its infrastructure, staff and funds.
- b) The Government of Japan through Japan International Cooperation Agency (JICA) in its capacity as sponsor of this initiative. JICA has consistently supported the development and implementation of national projects in member countries.

The 10th anniversary is also a moment of reflection to identify challenges to be addressed in the next decade and find appropriate and sustainable solutions. Administratively, the SMASE-WECSA should:

- a) Improve its internal organization in order to increase efficiency in its operations.
- b) Involve more member countries by giving them positions in the permanent secretariat.
- c) Make SMASE-WECSA more visible and ensure transparent management of SMASE-WECSA activities.

- d) Address the problem of language barrier by creating other Regional Centers to cater for Francophone and Lusophone member countries. This will also decongest CEMASTEAM due to the high demand for training by member countries.

African Governments must do more to consolidate the achievements of SMASE-WECSA and agree to guarantee its continuity by allocating an annual operating budget in form of regular contributions, donations, bequests, etc. A diversification policy of partnership and synergy of different interventions must guide staff members of SMASE-WECSA during the next decade. Consequently, the International Agencies involved in education need to support this initiative. Only the Japanese government is currently supporting the activities of SMASE-WECSA and it seems paradoxical for a program as broad and inclusive as SMASE WECSA. The World Bank, USAID, Canadian and French Cooperation, European Union, African Union and others must be at the forefront of this great partnership through the creation of a common interest to support the operations of SMASE-WECSA.

In my capacity as chairperson of the French Zone, I want to make the following suggestions to managers of SMASE-WECSA:

- JICA should support more projects in the Francophone countries because out of the 34 member countries, only three countries have running projects in Francophone Zone. Therefore, SMASE WECSA management should expedite the procedures for integration of the countries already in the pipeline such as Benin, Cameroon and Mali.
- Francophone Countries should also benefit from **long-term training** in Japan as it has been the case for Anglophone Countries.

SMASE-WECSA must establish a dynamic new vision and new momentum in the decade ahead. For good leadership and effective implementation of these two parameters, we need strong mobilization of stakeholders and beneficiaries. We need a firm commitment by member governments. SMASE-WECSA should create an effective means for the achievement of the Millennium Development Goals which will in turn ensure sustainable socio-economic development for our continent.

Long live SMASE-WECSA and primarily for the development of Africa through the provision of quality human resources.

Mr. Faye Adama
Vice Chairperson (Francophone)
SMASE-WECSA Association



Message from the Vice Chairperson (Lusophone), SMASE-WECSA Association



Prof. Sarifa Fagilde A. Magilde

We are celebrating the 10th anniversary of SMASE WECSA. How time goes fast!

I remember when some time ago I was dreaming about mathematics and science in my country, Mozambique. I was dreaming about mathematics and science in Africa. I was dreaming about mathematics and science in the world. There are many similar challenges everywhere, which call for the need to strengthen Mathematics and Science. These subjects are fundamental for the socio-economic development of a country.

Questions like: What has to be done to strengthen of these areas? How do we get more graduates teachers in these areas? How to have better qualified teachers? How to have gender balance? So many more questions were arising.

Suddenly I was invited to participate in a seminar in Nairobi-Kenya. It was almost ten years ago. I joined the group who had an opportunity to witness the birth of SMASE-WECSA that as we know now, stands for the Strengthening of Mathematics and Science Education in Western Eastern Central and Southern Africa. This marked the beginning to see my dreams become a reality.

SMASE-WECSA is growing up, through the increase in the number of country members, and moreover it is a forum for discussions among the Mathematics and Science family are:

- a) sensitized through joint workshops, technical exchange visits and INSET;
- b) helped when intending to start up INSET activities based on SMASE Project model;

c). are assisted by personnel from the secretariat, in capacity development for project management, in planning, implementation and evaluating INSET;

d). are familiarized about ASEI-PDSI Approach which is an intervention strategy to address the problems in the teaching and learning of mathematics and science. This strategy rallies teachers to shift their classroom practice from: teacher centered to student centered; content based to activity focused; theoretical method to experiment and research based approach.

A lot of work has been done, and much more still need to be done. So what is the impact ten years after the start of the SMASE WECSA association? Have the objectives been attained? How can we improve our work? Why not conduct research to find out the right answers?

Sustainability may also become a problem. How are the countries prepared in order to have sustainable programmes? The involvement of the governments through Ministries of Education and/or of Science and Technology seems to be important for the sustainability of this initiative. Is there any other way of sustaining this initiative? These are questions that need to be answered in order to recognize the wonderful contribution of the Government of Kenya through the Ministry of Education and CEMASTEPA and of the Government of Japan, through JICA. These Institutions are the ones who are making the dreams of many of us becoming reality!

Prof. Sarifa Fagilde A. Magilde
Vice-Chairperson (Lusophone),
SMASE-WECSA Association



Message from the Treasurer, SMASE-WECSA Association



Keiichi Naganuma

A Growing association has always something new to learn and share, something attractive, and a dynamic atmosphere to flourish. People can always find in its forum something good to be inspired by. The million Dollar questions is - "How can we keep our association developing?" The driving force must be contribution from members not only financially but also in the numbers of activities implemented by all members aiming at quality Maths and Science classroom practices in Africa.

It was with great pleasure to succeed treasurership of WECSA from Mr. Sugiyama who left Kenya in June 2008. He was the long serving Chief Advisor to SMASSE Project Kenya since 1998 on inception, and I am sure everybody knows how he contributed to the birth and quick growth of this forum. I have had the opportunity to be able to interact with a lot of friends, colleagues, like-minded people to work with through this association, for the betterment of MSE in Africa. It is my priceless treasure.

Let me also recognise the great works of Mr. Bernard Njuguna, the First Chairperson of this Association, who traversed many of your countries with Mr. Sugiyama try to convince their member countries to come on board to the association. I would also like to mention the contribution of Mrs. Lynette Kisaka who ha served as Secretary to the Association since its innugration. We should be truly be proud of them.

Looking back at the past 10 years, we have achieved a lot, visible and invisible progress has been made and we have been able to spread our core motto which is ASEI/PDSI to the continent. We have acquired more and more partners, including JICA, ADEA, NEPAD, NISMED, RECSAM and

AU in support our noble idea for the benefit of the African child and also to increase the scope of our activities. More countries are joining and establishing INSET activity for teachers CPD. I find it an amazing story. Who knew this remarkable achievement would have been realized 10 years ago?

On the other hand, there is still vast wild land to explore, too many challenges to overcome. Africa has invested a lot in terms of finances, human resource and time to improve access of education and meet the MDG, but we can't compromise quality education in classrooms. Other than the obstacles, we can't just wait for/without our action until many issues and factors are cleared, because our children will always be there waiting for our service. Do your best where you need to play an active role in providing better education for our children. Plan well, do your best, see the glowing children's faces and be inspired by their plight to improve your daily practice.

ASEI/PDSI is not only a motto for teachers. All stakeholders in WECSA Association are urged to understand and practice it right now. Nobody knows what we will achieve in the next decade, if we sincerely follow the ASEI/PDSI philosophy.

Keiichi Naganuma

**Treasurer, SMASE WECSA Association/Chief Advisor,
SMASE Project**



Pioneers of the SMASE programme during the opening of the SMASE project office in May 2002

Message from the RECSAM, Malaysia

The SEAMEO Regional Centre for Education in Science and Mathematics (RECSAM) is one of the 19 SEAMEO centres throughout the Southeast Asian region. Since its inception in 1967, the Centre has contributed significantly in meeting the educational manpower requirements of national and regional institutions in science and mathematics. RECSAM plays an increasing role in developing Science and Mathematics education in Africa since the centre became a member of the ADEA Working Group Steering Committee in 2007.

The Centre started the training of African science and mathematics educators under the SMASE-WECSA project when 5 trainers of the CEMASTEAM, Kenya were sponsored by the JICA to participate in the Centre's regular courses conducted in February 2006. This was followed by one-month customised courses for 40 Kenyan educators in August 2006, 24 Ugandan educators in June 2007 and 40 Kenyan educators in August 2007. Three customised courses were conducted for Ugandan, Nigerian and Zambian educators with a participation of 28 educators in June 2008, 32 in June 2009 and 20 in May 2010 respectively. A total of 20 participants from Lesotho, Malawi, Nigeria, Rwanda, Swaziland, Tanzania and Zambia also participated in 3 regular courses conducted in January 2008. The centre also organised two-week customized courses for 13 Malawi Science INSET trainers in February 2009 and 23 Mathematics and Science INSET trainers in November 2009.

In 2008, RECSAM was appointed as an implementing agency to conduct a Third Country Training Programme (TCTP) sponsored by the Malaysian Technical Cooperation Programme (MTCP) and JICA. Since then, RECSAM had conducted one TCTP course for African educators every year. These courses were aimed at strengthening the capacity of science and mathematics educators of African countries by enhancing their skills in promoting active teaching and learning in science and mathematics anchored on the philosophy of constructivism. During the training, participants in the science and mathematics courses engaged themselves in various activities to develop higher order thinking skills, design, implement and improve science and mathematics lessons creatively through active interaction and sharing of experiences among group members. A total of 88 participants, mainly teacher trainers and INSET facilitators, were trained in 3 cycles of the programme. The countries that were represented in the TCTP programme included Kenya, Lesotho, Malawi, Nigeria, Rwanda, Sudan, Swaziland, Tanzania, Uganda, Zambia, Ethiopia and Ghana.

The programmes conducted by the centre were well-received by the course participants. A number of participants sent reports of their action plans carried out in their home countries in enhancing the multiplier effect of the courses they attended. These participants were awarded certificates of recognition by the Centre for their efforts. RECSAM's involvement in the development of capacities of science and mathematics educators from the African continent can be viewed as an inter-regional partnership in which sharing of best practices in science and mathematics education takes place within the framework of South-South cooperation.

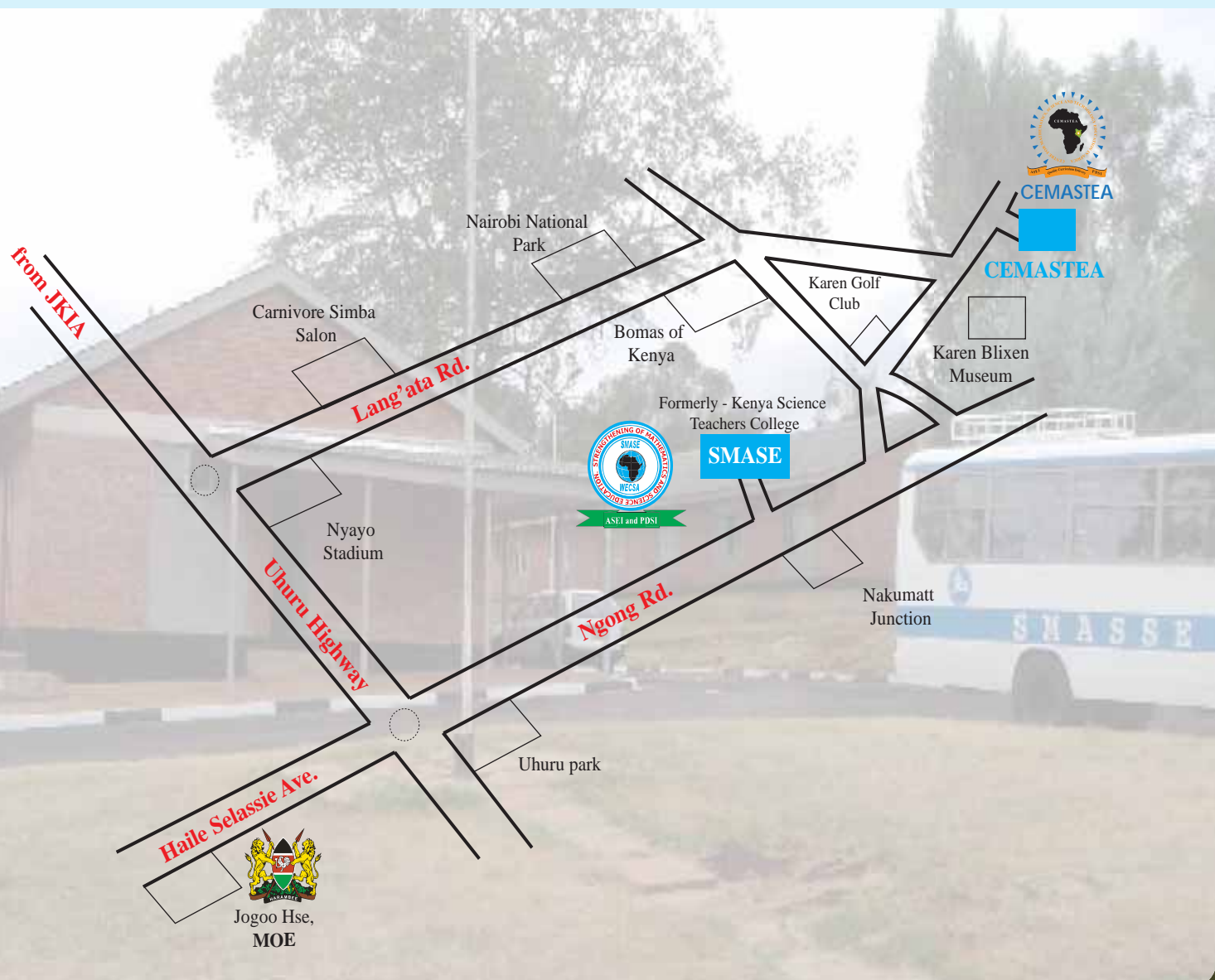
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TCTP for Kenyan teachers in Malaysia



Directional map for CEMASTEA and SMASE



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