

Federal Republic of Nigeria

FY2016 Ex-Post Evaluation of Technical Cooperation Project

“Strengthening of Mathematics and Science Education in Nigeria Project Phase 2”

External Evaluator: Sawa Hasegawa, OPMAC Corporation

## **0. Summary**

The objectives of this project were 1) to enhance the ability of primary school teachers of mathematics and science in the three pilot states by conducting In-Service Education and Training (INSET) on teaching methods for student centred lessons and 2) to enhance the ability of State Trainers as INSET providers in primary mathematics and science education while establishing a system to implement INSET in other states across the country. Through the achievement of the objectives, the project aimed to raise the general level of teaching skills of primary school teachers in mathematics and science education in the country and to improve the future capability of primary school pupils in mathematics and science education.

This project was consistent with the development plan and development needs of Nigeria, as well as with Japan’s ODA policy in view of quality improvement of education. Therefore, the project relevance is high. The project contributed to largely enhancing both the abilities of primary school teachers of mathematics and science for student centred lessons in the three pilot states and State Trainers as INSET providers in primary mathematics and science education in other states. In addition, it is also confirmed that the general level of teaching skills of primary school teachers in mathematics and science education had been enhanced in the area where INSET was introduced as of the time of the ex-post evaluation. The project therefore has produced its desired effects including those effects which were expected as the future impacts, the result being that its effectiveness and impact are high. On the other hand, both the project cost and the project period exceeded the plan due to insufficient and delayed allocation of INSET funds which frustrated the planned implementation of INSET schedule. Thus the efficiency of the project is fair. The sustainability of project effects is also fair since the funds for INSET implementation and monitoring were still insufficient for its implementation nationwide. However, INSET has been continuously implemented by the Nigerian side, on their own, after project completion as well as no special problem has been identified in the institutional, organizational and technical aspects.

In light of the above, this project is evaluated to be satisfactory.

## 1. Project Description



Project Location



Science class at a primary school in Abuja

### 1.1 Background

The educational system in Nigeria is the 6-3-3-4 system and the nine-year of primary education and lower secondary education are regarded as ‘basic education.’ Since 1999, the Nigerian Government had been promoting free and compulsory basic education under the universal basic education policy. As a result, the enrolment of pupils in primary schools increased from 17.9 million in 1999 to 22.3 million in 2005<sup>1</sup>. Although the access of children to primary education improved, the low quality of education in schools remained a serious challenge. Although one of the important factors influencing the quality of education is the teaching skills of teachers, nearly 50% of primary school teachers did not have a proper teacher certificate in Nigeria. Besides, lectures provided at teacher-training courses in universities and teacher’s colleges had not been conducted with the sufficient use of experimental techniques due to shortages of teaching aids and materials. Thus, teachers graduating from these courses also had insufficient teaching skills and experience in making lesson plans for mathematics and science which were experimentally based. Given the necessity of strengthening teachers’ ability in mathematics and science education, the Nigerian Government had conducted its own teacher training. However, the teacher training had not been implemented in effective and systematic manner, and thus, teachers hardly had an opportunity to improve their subject knowledge and teaching skills on regular basis.

In this situation, JICA conducted the “Project on Strengthening of Mathematics and Science Education in Nigeria” (hereinafter called Phase 1 Project) from 2006 to 2009 in Kaduna, Niger and Plateau States, which implemented the development of training materials as well as the training of trainers with the INSET cascade system for

<sup>1</sup> UNESCO “EFA Global Monitoring Report” 2008

mathematics and science in primary education. The Phase 1 Project used the knowhow on INSET implementation for mathematics and science teachers provided from the JICA’s technical cooperation “Project on Strengthening Mathematics and Science in Secondary Education (SMASSE)” (1998-2003) and SMASSE Phase 2 (2003-2008) where Kenyan experts of SMASSE were received. Four National Trainers at the national level and 24 State Trainers as well as about 600 Core Teachers in the three pilot states were trained under the Phase 1 Project.

The Nigerian Government highly valued the INSET introduced at the Phase 1 Project and requested that the Japanese Government implement the second phase of the project, which included the implementation of Local INSET in the three pilot states as well as National INSET in the remaining 34 states including 33 states and the Federal Capital Territory (FCT). This project was the Phase 2 Project.

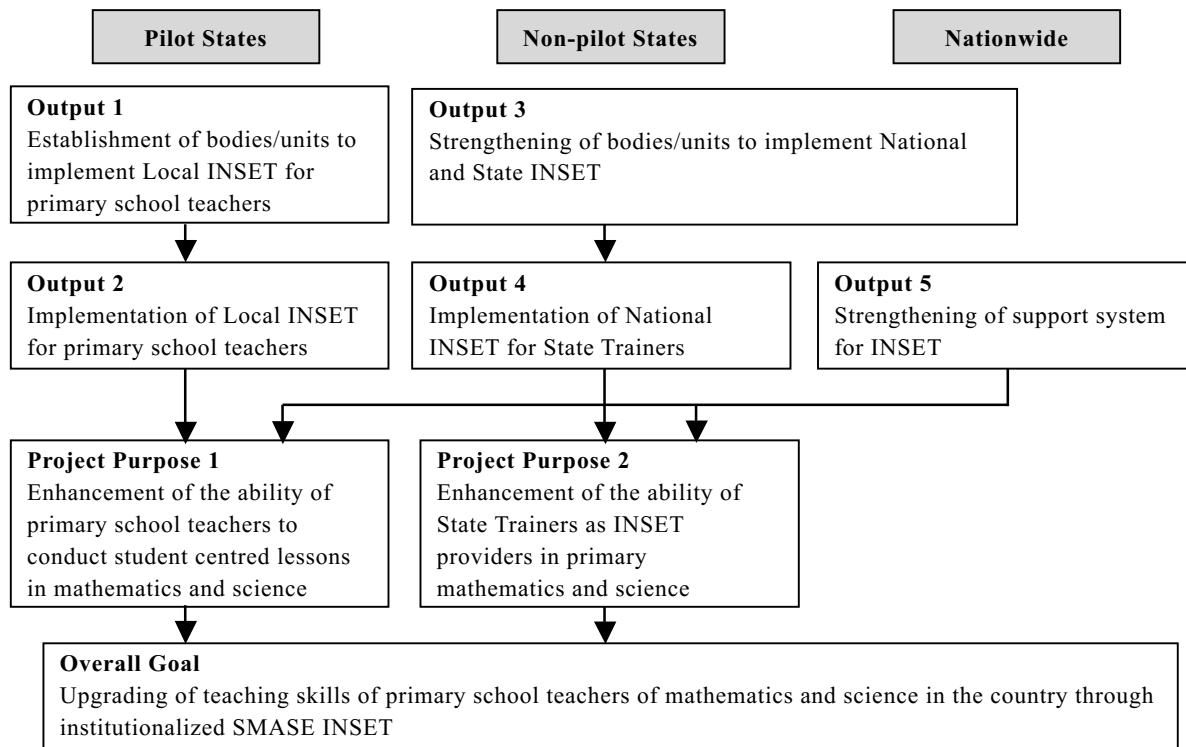
## 1.2 Project Outline

Overall Goal		Upgrading of teaching skills of primary school teachers in mathematics and science education in the country through institutionalized SMASE INSET <sup>2</sup>
Project Purpose		<ol style="list-style-type: none"> <li>1. Enhancement of the ability of primary school teachers in pilot states to conduct student centred lessons in mathematics and science.</li> <li>2. Enhancement of the ability of State Trainers as INSET providers in primary mathematics and science education in the other states.</li> </ol>
Outputs	Output 1	Establishment of bodies/units to implement the Local INSET for primary school teachers in the pilot states.
	Output 2	INSET for primary school teachers is conducted and assessed in the pilot states.
	Output 3	Strengthening of bodies/units to implement the INSET at national and state levels.
	Output 4	National INSET for State Trainers in the other remaining states is conducted and assessed.
	Output 5	Strengthening of support system for INSET.
Total Cost (Japanese Side)		520 million yen
Period of Cooperation		August 2010 – February 2014 (Extension period: August 2013 – February 2014)

<sup>2</sup> SMASE (Strengthening of Mathematics and Science Education) INSET collectively refers to a three-level cascade system of INSETs (National INSET, State INSET and Local INSET) conducted for the project.

Implementing Agencies	<ol style="list-style-type: none"> <li>1. Federal Ministry of Education (FME)</li> <li>2. National Teachers' Institute (NTI)</li> <li>3. National Commission for Colleges of Education (NCCE)</li> <li>4. Universal Basic Education Commission (UBEC)</li> <li>5. State Universal Basic Education Boards (SUBEB): 37 in total</li> <li>6. Local Government Education Authorities (LGEA) in the pilot states: 65 in total</li> </ol>
Other Relevant Agencies / Organizations	<ol style="list-style-type: none"> <li>1. Nigerian Educational Research and Development Council</li> <li>2. National Mathematical Centre</li> <li>3. Teachers Registration Council of Nigeria</li> </ol>
Supporting Agency/Organization in Japan	IC Net Limited
Related Projects	<p>&lt;Technical Cooperation&gt;</p> <ul style="list-style-type: none"> <li>- Strengthening of Mathematics and Science Education in Nigeria Project (2006-2009)</li> <li>- Follow-up on Strengthening of Mathematics and Science Education in Nigeria Project (2014)</li> </ul> <p>&lt;Grant Aid&gt;</p> <ul style="list-style-type: none"> <li>- The Project for Construction of Additional Classrooms for Primary Schools (Phase I: August 2004, Phase II: July 2005, Phase III: July 2006)</li> <li>- The Project for Construction of Additional Classrooms for Primary Schools Phase 2 (June 2010)</li> <li>- The Project for Construction of Classrooms for Primary School in Oyo State (September 2014)</li> </ul>

As shown in the Project Outline above, this project consists of two Project Purposes. The relationship between the two Project Purposes and the five Outputs as well as the scopes of Phase 1 and Phase 2 Projects are shown as follows.



Source: Made by the external evaluator

Notes: Pilot states: 3 states of Kaduna, Niger and Plateau

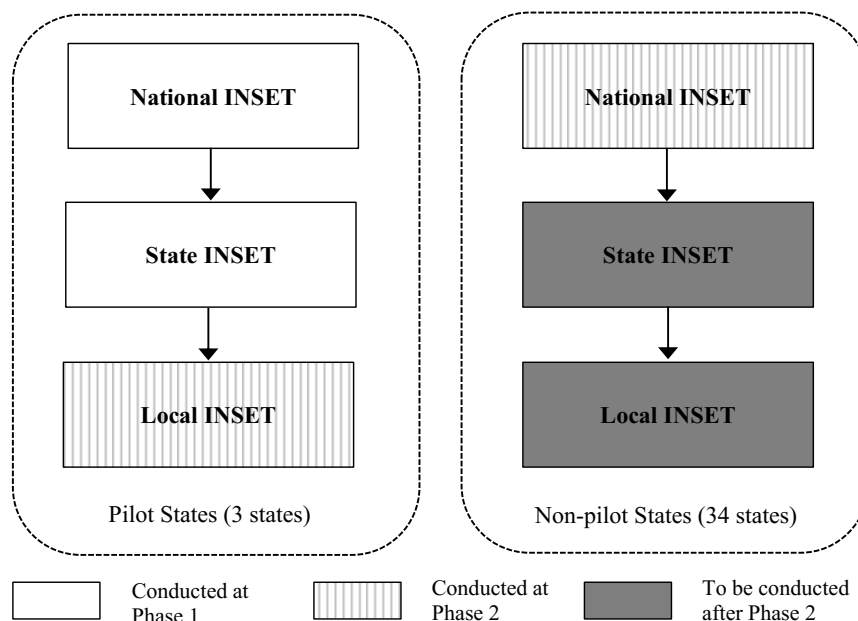
Non-pilot states: 33 states and FCT, 34 states in total

National INSET: Training where National Trainers train State Trainers, which is conducted at NTI in Kaduna

State INSET: INSET where State Trainers train Core Teachers

Local INSET: INSET where Core Teachers train primary school teachers (basically all teachers)

Figure 1: Composition of Overall Goal, Project Purposes and Outputs



Legend:  
 [White Box] Conducted at Phase 1  
 [Hatched Box] Conducted at Phase 2  
 [Grey Box] To be conducted after Phase 2

Source: Made by the external evaluator

Figure 2: Scopes of Phase 1 and Phase 2 Projects

SMASE INSET consists of three repetitions of Cycle 1, 2 and 3 for National, State and Local INSET, the training periods of the respective cycles being from ten days to two weeks each. It was planned that both Local INSET in the pilot states and National INSET for State Trainers in the non-pilot states would be implemented with one cycle a year and all cycles were to be completed within three years of the project period. The insufficient and delayed allocation of INSET funds, however, caused a significant delay in the implementation schedule of both INSET, which resulted in participation in Cycle 1 only in Kaduna, Cycle 3 for some teachers in Niger, and Cycle 2 for some teachers in Plateau for Local INSET as well as participation in Cycle 1 only for National INSET by the end of the project (The remaining cycles have been implemented by the Nigerian side, on their own, after project completion).

### 1.3 Outline of the Terminal Evaluation

While it was planned that project would be completed in July 2013, the implementation of both Local INSET in the pilot states and National INSET for the non-pilot states fell considerably behind schedule as described above. The terminal evaluation of the project was conducted in February 2013 and it was proposed that the project be extended for approximately one year due to the delayed schedule. The project period was finally extended for seven months up to February 2014.

#### 1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

It was judged that the achievement of the Project Purpose by the end of the project would be difficult as the number of participants in Local INSET in the pilot states as well as the number of participants in National INSET for the non-pilot states had fallen below the target values, although the enhancement of the abilities of participants in both was largely achieved.

#### 1.3.2 Achievement Status of the Overall Goal at the Terminal Evaluation

While many cases of improvement in the teaching skills of primary school teachers in mathematics and science education were reported, as of the terminal evaluation, it was estimated that the implementation of Local INSET across the country would take roughly ten years.

#### 1.3.3 Recommendations from the Terminal Evaluation

It was recommended that the project period be delayed and delayed activities, including the implementation of INSET, be carried out during the extended period. The recommendations were largely completed during the extended period.

## **2. Outline of the Evaluation Study**

### 2.1 External Evaluator

Sawa Hasegawa, OPMAC Corporation

### 2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: August, 2016 – September, 2017

Duration of the Field Study: November 6 – 18, 2016 and May 18 – 23, 2017

### 2.3 Constraints during the Evaluation Study

There were several constraints in this ex-post evaluation.

- (1) The project scope was huge. The target site was the whole country and the target group was primary school teachers across the country (more than 700 thousand in total). In addition, the external evaluator was unable to visit some states for the field survey due to the unfavourable security situation in Nigeria. It was impossible to conduct the field survey in all the states due to constraints of time, cost and security. The target sites of the beneficiary survey for primary school teachers therefore had to be selected in an arbitrary manner, resulted in the selection of only five states including the three pilot states, FCT and Kogi State. Furthermore, the selection of respondents of the beneficiary survey was also arbitrary since primary schools were extensively scattered over the respective states making it very difficult to select respondents in the five states with random sampling. In view of this there were constraints in judging the project impact such as the achievement of the Overall Goal and the possibility of overvaluation or undervaluation.
- (2) As described above, the target site and the target group of the project were huge. In addition, due to the difficulty in obtaining exact educational statistical data in Nigeria, including from the central and regional related agencies, there were cases where accurate data on numbers of INSET participants, expenditures, etc. were unavailable. In addition, there were discrepancies between data obtained at the ex-post evaluation and data obtained from past project documents. Thus there were constraints in the accuracy and reliability of the data obtained.
- (3) The “lesson observation index” and “pupils’ participation index” were set as indicators for Project Purpose 1. The data for the lesson observation index was collected by observing actual mathematics and science lessons performed by 30

primary school teachers (10 teachers from the respective three pilot states) who were selected as sample data. The data for the pupils' participation index was collected by conducting a questionnaire survey with pupils who took the lessons of the 30 primary school teachers on the same day as lesson observation index data was collected. While the target of Project Purpose 1 was all primary school teachers in the pilot states (approximately 70 thousand), it would have been impossible to collect data on indicators by observing such a large number of mathematics and science lessons and therefore the sample size was greatly reduced to only 30 out of 70 thousand. In this regard, the data on the indicator obtained from 30 teachers cannot be said to be sufficient as representative data for all primary school teachers in the pilot states. However, as it was not possible to collect inter-annual data on this indicator at the time of the ex-post evaluation, the achievement of Project Purpose 1 had to be judged based on the data obtained during the project period.

- (4) This ex-post evaluation was conducted for the Phase 2 Project as a project-level evaluation. As shown in Figure 2, however, SMASE INSET in Nigeria has been conducted not only by this project, but also by the Phase 1 Project, the Phase 2 Project and through initiative activities of the Nigerian side after the project completion, which is regarded as the national program. It is therefore difficult to specify a single effect of the project among the series of SMASE INSET; judgement of the effectiveness and impact of the project should include the effects of other efforts. It was therefore difficult to measure the effectiveness and impact of the single project as ex-post evaluation was conducted for this project only, based on the project-level evaluation.

### **3. Results of the Evaluation (Overall Rating: B<sup>3</sup>)**

#### 3.1 Relevance (Rating: ③<sup>4</sup>)

##### 3.1.1 Consistency with the Development Plan of Nigeria

The Nigerian national development plan “Nigeria Vision 2020” (2010-2020) rates the education sector as one of the most important sectors and clearly states the enhancement of human resource development as a goal for the education sector.

In addition, education sector policies in Nigeria including the “National Policy on Education” (2004-), the “10 Year Strategic Plan for Federal Ministry of Education” (2010-2020), the “Roadmap for Nigerian Education Sector” (2008-2014) and the “National Teacher Education Policy” (2009-) stipulate the importance of the capacity

<sup>3</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>4</sup> ③: High, ②: Fair, ①: Low



development of teachers to secure the quality of education as well as the necessity of the continuous implementation of INSET to maintain and improve the quality of teachers. Thus the project was consistent with the development plan of Nigeria both at the time of project planning and completion.

### 3.1.2 Consistency with the Development Needs of Nigeria

As described in “1.1 Background,” the Phase 1 Project was responsible for the development of training materials and the training of trainers for SMASE INSET in Kaduna, Niger and the Plateau States. The Nigerian Government attached a high value on SMASE INSET at the time of the completion of the Phase 1 Project and had a strong preference for the continuous implementation of SMASE INSET not only in the three states but also in other states across the country. At the same time, the Government thought that the establishment of the INSET system was not enough to disseminate SMASE INSET throughout the country, including the implementation of Local INSET in the three states after the completion of the Phase 1 Project and showed a strong desire to implement Local INSET in the three states as well as to establish the implementation system of SMASE INSET in the remaining 34 states. At the time of the completion of this project the government also indicated their intention to continuously implement SMASE INSET on their own after project completion. Thus, the project was consistent with the development needs of Nigeria throughout the time of project planning and completion.

### 3.1.3 Consistency with Japan’s ODA Policy

The third economic cooperation policy meeting between the Nigerian and Japanese Governments held in October 2007 placed ‘basic education’ as one of the priority areas for assistance and emphasized technical cooperation for implementation focused on the qualitative and quantitative expansion of teachers. In addition, the “Yokohama Action Plan” adopted in the Fourth Tokyo International Conference on African Development (TICAD IV) held in May 2008 set the goal of expanding teacher training in math and science through SMASE by expanding SMASE projects for 100,000 teachers. Thus the project was consistent with Japan’s ODA policy towards Nigeria at the time of project planning.

This project was highly relevant to the Nigeria’s development plan and development needs, as well as to Japan’s ODA policy. Therefore, its relevance is high.

## 3.2 Effectiveness and Impact<sup>5</sup> (Rating: ③)

### 3.2.1 Effectiveness

#### 3.2.1.1 Relations between Project Purpose and Outputs

This project consists of two Project Purposes. As shown in Figure 1 in “1.2 Project Outline,” the project aimed to achieve Project Purpose 1: enhancement of the ability of primary school teachers to conduct student centred lessons in mathematics and science, through the achievements of Output 1: the establishment of bodies/units to implement Local INSET in the three pilot states and Output 2: the implementation of Local INSET. The second aim was the achievement of Project Purpose 2: enhancement of the ability of State Trainers as INSET providers in primary mathematics and science education in the non-pilot states, through the achievements of Output 3: strengthening of bodies/units to implement National INSET and State INSET in the non-pilot states and Output 4: implementation of National INSET for State Trainers in the non-pilot states.

The implementation of Local INSET in the pilot states for Output 2 was planned with approximately all 70,000 primary school teachers in the three states participating in the Local INSET three Cycles, 1, 2 and 3. However, implementation according to the original plan was regarded as impossible, mainly due to the insufficient and delayed allocation of INSET funds. The target value was revised downward in the middle of the project with 35,000 teachers participating in at least Cycle 1. Finally, 42,982 primary teachers participated in Local INSET<sup>6</sup>.

In the same way, while it was planned that National INSET for State Trainers in the non-pilot states for Output 4 would be implemented in three Cycles, 1, 2 and 3, this was revised to just Cycle 1. The number of participants in National INSET was not revised from the original plan. Approximately 12 from the respective states and 413 State Trainers in total from 33 states, not including Lagos State, participated in National INSET. The only state out of 34 non-pilot states not participating was Lagos State<sup>7</sup>.

Meanwhile, School-based Training (SBT), where participants of Local INSET teach other teachers in the same school about what they learned at SMASE INSET, was

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<sup>5</sup> Sub-rating for Effectiveness is to be put with consideration of Impact.

<sup>6</sup> The insufficient and delayed allocation of INSET funds was caused by their not being disbursed from the Nigerian side as planned (to be described in “3.3 Efficiency.”) Other reasons for the delayed schedule were as follows; 1) Kaduna State had a shortage of SMASE INSET funds which were allocated for another, preceding, INSET on a priority basis and 2) Plateau State experienced strikes by teachers during the project period and had a period of being unable to implement INSET. For this reason, the implementation schedules of Local INSET differed according to the three states. Local INSET had been completed up to participation in Cycle 1 in Kaduna, Cycle 3 for some teachers in Niger, Cycle 2 for some teachers in Plateau by the end of the project.

<sup>7</sup> Lagos State had the policy of conducting capacity development of teachers on their own and indicated their intention of not participating in SMASE INSET throughout the project period.

introduced to the pilot states as measures to the decrease in the number of participants in Local INSET. Workshops were held for headteachers in all primary schools and supervisors in the pilot states during the project period to introduce and encourage the implementation of SBT in their schools and states.

In light of the above, it can be seen that, as a result of revising the numbers of participants and times for Local INSET in the pilot states, as well as National INSET for the non-pilot states, the respective outputs were largely achieved by project completion.

### 3.2.1.2 Achievement of Project Purpose

The achievement of Project Purpose is judged by the results of the indicators set for the project. The indicators and their actual results are as follows.

Table 1: Achievement of Project Purpose

Project Purpose	Indicator	Actual																
1. Enhancement of the ability of primary school teachers to conduct student centred lessons in mathematics and science in the pilot states.	<p>The ability of primary school teachers in 3 pilot states will improve with a lesson observation index obtained on a scale of <math>1 &lt; x &lt; 5</math> with <math>x \geq 3</math> as an acceptable mean.</p> <p>Note: The method of measuring this index is by directly observing the lessons of sample teachers according to the checklist and rating them on a scale of 1 to 5 in terms of 1) teaching procedure, 2) fundamental techniques/methodology and 3) class management/control.</p>	<p>The data from the lesson observation index before participating in Local INSET, after participating in Cycle 1, and after participating in Cycle 2 were collected from sample teachers, 10 each from the 3 pilot states, 30 in total<sup>8</sup>. The respective mean scores of the lesson observation index are as follows.</p> <table border="1"> <thead> <tr> <th></th> <th>Baseline</th> <th>After Cycle 1</th> <th>After Cycle 2</th> </tr> </thead> <tbody> <tr> <td>Kaduna</td> <td>2.0</td> <td>3.0</td> <td>NA</td> </tr> <tr> <td>Niger</td> <td>1.7</td> <td>2.6</td> <td>3.0</td> </tr> <tr> <td>Plateau</td> <td>1.9</td> <td>3.0</td> <td>NA</td> </tr> </tbody> </table> <p>Source: Internal documents provided by JICA            Note: The baseline data is the data obtained before participating in training for each state.            Note: The data for after Cycle 2 was not collected in Kaduna and Plateau as Cycle 2 had not been conducted by the time of project completion in Kaduna and only some teachers had participated in Cycle2 in Plateau.</p> <p>The mean scores of the 3 states was 3, as seen above.</p>		Baseline	After Cycle 1	After Cycle 2	Kaduna	2.0	3.0	NA	Niger	1.7	2.6	3.0	Plateau	1.9	3.0	NA
	Baseline	After Cycle 1	After Cycle 2															
Kaduna	2.0	3.0	NA															
Niger	1.7	2.6	3.0															
Plateau	1.9	3.0	NA															

<sup>8</sup> The sampling method was 1) randomly selecting the respective 10 Local Government Areas (LGAs) in the three states; 2) randomly selecting one school each from the 30 selected LGAs; and 3) selecting one teacher in charge of mathematics and science mainly for 4th, 5th and 6th grades each from the 30 selected schools.

Project Purpose	Indicator	Actual																		
	<p>The ability of primary school teachers in the 3 pilot states will improve with a pupils' participation index obtained on a scale of <math>1 &lt; x &lt; 5</math> with <math>x \geq 3</math> as acceptable mean.</p> <p>Note: The method of measuring this index was through questioning pupils who took the lessons of the sample teachers which were for the lesson observation index and the rating was on a scale of 1 to 5.</p>	<p>The mean scores of the pupils' participation index obtained from lessons conducted by the sample teachers above are as follows.</p> <table border="1"> <thead> <tr> <th></th> <th>Baseline</th> <th>After Cycle 1</th> <th>After Cycle 2</th> </tr> </thead> <tbody> <tr> <td>Kaduna</td> <td>2.2</td> <td>2.3</td> <td>NA</td> </tr> <tr> <td>Niger</td> <td>1.7</td> <td>2.4</td> <td>2.8</td> </tr> <tr> <td>Plateau</td> <td>2.5</td> <td>2.4</td> <td>NA</td> </tr> </tbody> </table> <p>Source: Internal documents provided by JICA</p> <p>The mean scores of the 3 states did not reach 3 although they increased somewhat after training as seen above.</p>		Baseline	After Cycle 1	After Cycle 2	Kaduna	2.2	2.3	NA	Niger	1.7	2.4	2.8	Plateau	2.5	2.4	NA		
	Baseline	After Cycle 1	After Cycle 2																	
Kaduna	2.2	2.3	NA																	
Niger	1.7	2.4	2.8																	
Plateau	2.5	2.4	NA																	
2. Enhancement of the ability of State Trainers as INSET providers in primary mathematics and science education in other remaining states.	<p>The ability of State Trainers will improve in the attitude of teachers to the teaching of mathematics and science with obtainments on the index on a scale of <math>1 &lt; z &lt; 5</math> with <math>z \geq 3</math> as an acceptable mean.</p> <p>Note: The method of measuring this index is rating the attitudes of participants on the following five categories, A to E, on a scale of 1 to 5.</p> <p>A: Attitude towards the purpose of teaching/learning of mathematics and science  B: Attitude towards methodology  C: Attitude towards lesson planning  D: Attitude towards overcoming limitations  E: Attitude towards teaching/learning activities</p>	<p>The data on the attitude of teachers to the teaching of mathematics and science before and after participating in Cycle 1 of National INSET were collected from 413 State Trainers. The mean scores of the 5 categories are as follows.</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Before Training</th> <th>After Training</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>3.90</td> <td>4.59</td> </tr> <tr> <td>B</td> <td>4.25</td> <td>4.64</td> </tr> <tr> <td>C</td> <td>3.88</td> <td>4.62</td> </tr> <tr> <td>D</td> <td>3.27</td> <td>4.33</td> </tr> <tr> <td>E</td> <td>4.19</td> <td>4.60</td> </tr> </tbody> </table> <p>Source: Internal documents provided by JICA</p> <p>The mean scores by all categories increased after training and reaching more than 4, as seen above.</p>	Category	Before Training	After Training	A	3.90	4.59	B	4.25	4.64	C	3.88	4.62	D	3.27	4.33	E	4.19	4.60
Category	Before Training	After Training																		
A	3.90	4.59																		
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C	3.88	4.62																		
D	3.27	4.33																		
E	4.19	4.60																		

Regarding Project Purpose 1, as shown in Table 1, while in the lesson observation index, out of two indicators, achieved the target value, the pupils' participation index did not. However, although SMASE INSET was completed with participation in the three times Cycle, 1, 2 and 3 for National, State and Local INSETs, the target teachers had not participated three times at the end of the project due to the decrease in the number of participating in Local INSET in the middle of the project. The data on both indexes above is based on participation in Cycle 1 and 2 for Niger and for Cycle 1 only for Kaduna and Plateau. Although the target values ( $x \geq 3$ ) of two indicators could have been downgraded together with the decrease in the number of times of participation, it was difficult to set exact target values consistent with the decreased rate and therefore the initial values were kept. As a result of this, the level of the target values of  $x \geq 3$  was to a certain extent high.

Although the pupils' participation index did not achieve its target value, data largely increased after Cycle 1 and 2. Looking at trends in the data for Niger, where

teachers completed Cycle 2, it is anticipated that the target value would be achieved in the three states with the completion of Cycle 3. In addition, by way of its nature, the achievement of the pupils' participation index takes more time to take effect compared to the lesson observation index. Considering the results of the two indicators in a comprehensive manner, it is considered that the ability of primary school teachers to conduct student centred lessons in mathematics and science in the pilot states was largely enhanced and that Project Purpose 1 was largely achieved.

Regarding Project Purpose 2, data on the attitude of teachers to the teaching of mathematics and science index increased and reached its target value after teachers participated in National INSET. Meanwhile, the data were based on the participation in only Cycle 1 for State Trainers in the non-pilot states. It is considered that ability as INSET providers in mathematics and science education was enhanced and that Project Purpose 2 was achieved.

In light of the above, the project largely achieved its purpose.

### 3.2.2 Impact

The Overall Goal of the project is "Upgrading of teaching skills of primary school teachers of mathematics and science in the country through institutionalized SMASE INSET." It is unclear when judging the achievement of the Overall Goal whether it targets all primary school teachers in the country or all the participants in Local INSET. At the time of project planning, it was planned that all primary teachers across the country would participate in Local INSET so that all primary teachers would be equal in their participation in Local INSET. It was not possible for all primary teachers to participate in Local INSET due to financial constraints, which resulted in including teachers who had not participated in Local INSET among all primary school teachers in the country if targeting all the teachers.

Considering that the intention of the Overall Goal was the "improvement in the general level of teaching skills of primary school teachers in mathematics and science education in the country," all primary school teachers in the country should have been targeted. The beneficiary survey for primary school teachers conducted at this ex-post evaluation to judge the achievement level of the Overall Goal therefore targeted both participants and non-participants in Local INSET (participants in SBT were included in the non-participants). However, it should be noted that the result of this beneficiary survey does not represent all primary school teachers in the country since the survey was conducted only in five states, including the three pilot states, FCT and Kogi State. Furthermore, the selection of survey respondents had to be made with arbitrariness as described at (1) in "2.3 Constraints during the Evaluation Study."

In addition, in the original plan, this project did not clearly specify the target year for achieving the Overall Goal and so this ex-post evaluation evaluated how much the indicators set for the Overall Goal were achieved as of the time of the ex-post evaluation.

### 3.2.2.1 Achievement of the Overall Goal

The achievement of the Overall Goal is also judged according to the results of the indicators set for the project. The indicators and their actual results are as follows.

Table 2: Achievement of Overall Goal

Overall Goal	Indicator	Actual
Upgrading of teaching skills of primary school teachers of mathematics and science in the country through institutionalized SMASE INSET.	Positive change in teachers' attitude and improved performance in subject mastery, pedagogical skills and ASEI-PDSI in classroom activities  Note: 'ASEI-PDSI' is a kind of approach commonly used in JICA technical cooperation projects for the strengthening of mathematics and science education and stands for "Activity, Student-centred, Experiment, Improvisation / Plan, Do, See, Improve."	<ul style="list-style-type: none"> <li>- The beneficiary survey with 100 primary school teachers (50 participants and 50 non-participants in Local INSET) in the five states, including the three pilot states, of Kaduna, Niger and Plateau, FCT and Kogi was conducted in the ex-post evaluation<sup>9</sup>. An overview of respondents of this survey is shown in Table 3-Table 6.</li> <li>- According to the results of the beneficiary survey, both the levels of understanding of Local INSET on the part of participants and of SBT on the part of non-participants were high and more than 90% of them responded that their teaching skills had improved after participating in Local INSET or SBT. Furthermore, it was confirmed that more than 80-90% of participants and 70-80% of non-participants had practiced ASEI-PDSI in their mathematics and science lessons. Considering all the results of the beneficiary survey, the general level of the teaching skills of primary school teachers in the five states have been improved. The reasons why non-participants practiced ASEI-PDSI were their participation in SBT as well as their having received instruction from participants. The specific results of the survey are shown in Figure 3-Figure 12<sup>10</sup>.</li> </ul>

<sup>9</sup> FCT and Kogi State were selected from the 15 non-pilot states where Local INSET had been implemented at the time of the ex-post evaluation taking into consideration geographical and security conditions as described in "2.3 Constraints during the Evaluation Study." The sample size of the survey was 100 in the total 5 states and although it was intended that there would be 10 schools in the respective states and 1 school from a LGA, schools were selected from 3-4 LGAs in the respective states since it was difficult to select 10 LGAs due to constraints in time, location and security. Furthermore, it was difficult to contact the target schools without any introduction, so the schools were basically introduced by the respective SUBEBs or State Trainers.

<sup>10</sup> Regarding the "improved performance in subject mastery, pedagogical skills and ASEI-PDSI in classroom activities" in the indicator, SMASE INSET was designed for teachers to improve their teaching skills by adopting the ASEI-PDSI approach in their lessons and not to increase their knowledge of the subjects themselves. In addition, this project targeted primary education, which did not include advanced levels of science and mathematics, so it was confirmed among the implementing agencies and experts during the project period that they would not evaluate teachers' levels of knowledge and understanding of their subjects. 'Pedagogical skills' and 'ASEI-PDSI in classroom activities' except for 'subject mastery' in the indicator were therefore analyzed for the ex-post evaluation. This beneficiary survey examined such questions as 'understanding level of training,' 'improvement in teaching skills after participating in training,' 'practice level of ASEI-PDSI in lessons,' etc. and the achievement of this indicator were judged with all the survey results considered.

Overall Goal	Indicator	Actual
	Regular SMASE INSET is conducted systematically.	<ul style="list-style-type: none"> <li>- Local INSET was continuously conducted in the three pilot states after project completion. The numbers of participants in Cycles 1, 2 and 3 as of November 2016 are shown in Table 7.</li> <li>- State and Local INSET were also continuously conducted in the non-pilot states after project completion. The implementation status of the National, State and Local INSET in non-pilot states as of May 2017 is shown in Table 8.</li> </ul>

Table 3: Numbers of Respondents of Beneficiary Survey for Each State and LGA

Unit: persons

States	LGAs	Participants	Non-participants
Kaduna	Chikun	3	3
	Kaduna South	3	3
	Kaduna North	3	3
	Igabi	1	1
	Sub-total	10	10
Niger	Chanchaga	1	1
	Lapia	2	2
	Paikoro	4	4
	Bosso	2	2
	Gurara	1	1
	Sub-total	10	10
Plateau	Barkin Ladi	2	2
	Pankshin	1	1
	Jos South	3	3
	Jos North	2	2
	Mangu	1	1
	Bassa	1	1
	Sub-total	10	10
FCT	Amac	8	8
	Bwari	2	2
	Sub-total	10	10
Kogi	Lokoja	8	8
	Ajaokuta	1	1
	Koton karfi	1	1
	Sub-total	10	10
	Total	50	50

Source: Beneficiary survey (sample numbers: 100)

Table 4: Numbers of Male and Female Respondents of Beneficiary Survey

Unit: persons

	Participants	Non-participants
Male	14	9
Female	36	41
Total	50	50

Source: Beneficiary survey (sample numbers: 100)

Table 5: Numbers of Participants in Respective Cycles of Local INSET <sup>Note</sup>

Unit: persons

	Participants
Cycle 1	43
Cycle 2	41
Cycle 3	16

Source: Beneficiary survey (sample numbers: 50)

Note: Although there is a general rule in SMASE INSET that only the participants of Cycle 1 can participate in Cycle 2 and 3, some teachers participated in Cycle 2 and 3 without participating in Cycle 1.

Table 6: Numbers of Participants in SBT among Non-participants

Unit: persons

Participated in SBT	41
Did not participate in SBT	9

Source: Beneficiary survey (sample numbers: 50)

Table 7: Numbers of Primary Teachers, State Trainers, Core Teachers, and Participants in Local INSET in the 3 Pilot, FCT and Kogi States (as of November 2016)

Unit: persons

	Kaduna	Niger	Plateau	FCT	Kogi
Number of primary teachers	34,004	21,086	15,794	9,438	17,831
Number of State Trainers	9	9	10	12	12
Number of Core Teachers	163	200	200	200	200
Number of participants in Local INSET (Cycle 1)	4,600 (4,600)	10,129 (9,570)	15,520 (15,520)	2,600	600
Number of participants in Local INSET (Cycle 2)	4,600 (2,300)	6,586 (5,400)	5,700 (2,992)	2,684	600
Number of participants in Local INSET (Cycle 3)	2,300 (0)	6,000 (2,600)	Yet to be conducted	Yet to be conducted	Yet to be conducted

Source: Questionnaire responses from the respective SUBEBs

Note 1: The numbers above are based on the results of questionnaire responses from the respective SUBEBs, so some numbers are approximate calculations.

Note 2: The numbers of participants in Local INSET are total numbers of participants and the lower numbers noted in brackets are numbers of participants who took Local INSET during the project period.



Table 8: Implementation Status of SMASE INSET in Non-pilot States (as of May 2017)

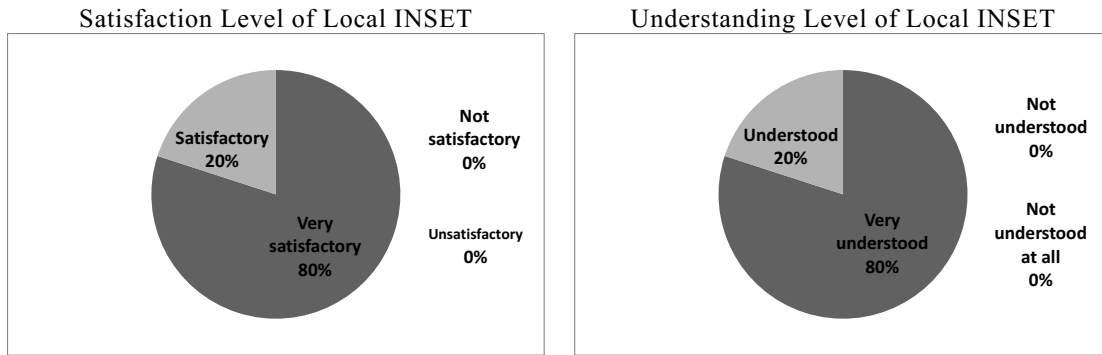
States	National INSET			State INSET			Local INSET		
	Cycle 1	Cycle 2	Cycle 3	Cycle 1	Cycle 2	Cycle 3	Cycle 1	Cycle 2	Cycle 3
1 ABIA	Done	(Done)	(Done)	Done	(Done)	(Done)			
2 ADAMAWA	Done	(Done)		Done	(Done)				
3 ANAMBRA	Done	(Done)		(Done)	(Done)		(Done)		
4 AKWA-IBOM	Done	(Done)		Done	(Done)		(Done)		
5 BAUCHI	Done	(Done)	(Done)	Done	(Done)				
6 BAYELSA	Done			(Done)					
7 BENUE	Done	(Done)		Done	(Done)		Done		
8 BORNO	Done	(Done)		Done	(Done)	(Done)	(Done)		
9 CROSS-RIVER	Done	(Done)	(Done)	Done	(Done)				
10 DELTA	Done	(Done)		Done	(Done)		(Done)		
11 EBONYI	Done	(Done)	(Done)	Done	(Done)	(Done)	Done		
12 EKITI	Done	(Done)	(Done)	Done	(Done)	(Done)			
13 EDO	Done			(Done)					
14 ENUGU	Done	(Done)	(Done)	Done			(Done)		
15 FCT-ABUJA	Done	(Done)		Done	(Done)		Done	(Done)	
16 GOMBE	Done	(Done)	(Done)	Done	(Done)			(Done)	
17 IMO	Done	(Done)		Done	(Done)		Done	(Done)	
18 JIGAWA	Done	(Done)		Done					
19 KEBBI	Done	(Done)		Done	(Done)		Done		
20 KOGI	Done	(Done)		Done	(Done)		Done	(Done)	
21 KANO	Done			(Done)					
22 KASTINA	Done	(Done)	(Done)	Done	(Done)				
23 KWARA	Done	(Done)		(Done)	(Done)				
24 LAGOS									
25 NASSARAWA	Done	(Done)	(Done)	Done	(Done)	(Done)			
26 OYO	Done	(Done)	(Done)	Done	(Done)	(Done)			
27 ONDO	Done	(Done)	(Done)	Done	(Done)		(Done)		
28 OGUN	Done	(Done)		(Done)	(Done)				
29 OSUN	Done	(Done)	(Done)	Done	(Done)		(Done)		
30 RIVERS	Done	(Done)		(Done)	(Done)			(Done)	
31 SOKOTO	Done	(Done)		Done					
32 TARABA	Done	(Done)	(Done)	Done	(Done)		Done	(Done)	
33 YOBE	Done	(Done)	(Done)	Done			(Done)		
34 ZAMFARA	Done	(Done)		Done					
<b>Total</b>	<b>33</b>	<b>30</b>	<b>14</b>	<b>33</b>	<b>25</b>	<b>6</b>	<b>15</b>	<b>6</b>	<b>0</b>

Source: Made by the external evaluator based on documents provided by FME

Note: 'Done' means that the Cycle had been implemented during the project period and '(Done)' means that the Cycle was implemented after project completion.

### (1) Survey Results for Participants

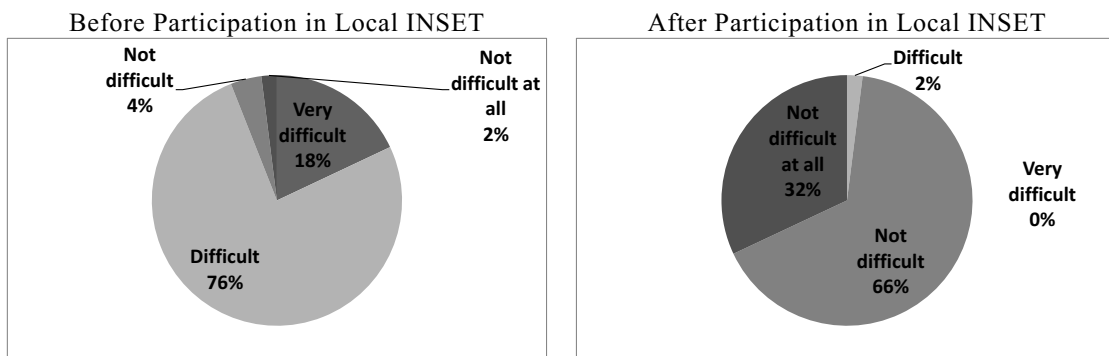
Figure 3 shows the levels of satisfaction and understanding of Local INSET among participants. All participants responded 'Very satisfactory' 'Satisfactory' and 'Very well understood' and 'Understood,' which means both levels were high.



Source: Beneficiary survey (sample numbers: 50)

Figure 3: Participants' Levels of Satisfaction and Understanding of Local INSET

Regarding changes after participation in Local INSET, the rate of response concerning difficulty in teaching science and mathematics decreased (Figure 4) while the rate of response concerning confidence increased (Figure 5). There was no special change in the rate for the preparation of lesson plans for science and mathematics<sup>11</sup> since the rate of teachers who had made lesson plans before participation was high, but there were no teachers who did not make lesson plans at all after participation (Figure 6).



Source: Beneficiary survey (sample numbers: 50)

Figure 4: Participants' Challenges/Difficulties in Teaching Science and Mathematics Before and After Participation in Local INSET

<sup>11</sup> Making lesson plans is encouraged in the 'Plan' of ASEI-PDSI.

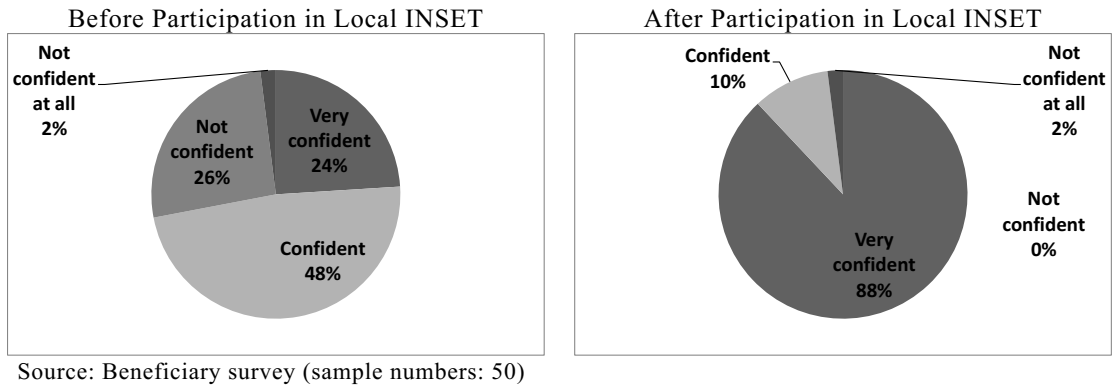


Figure 5: Participants' Confidence in Teaching Science and Mathematics Before and After Participation in Local INSET

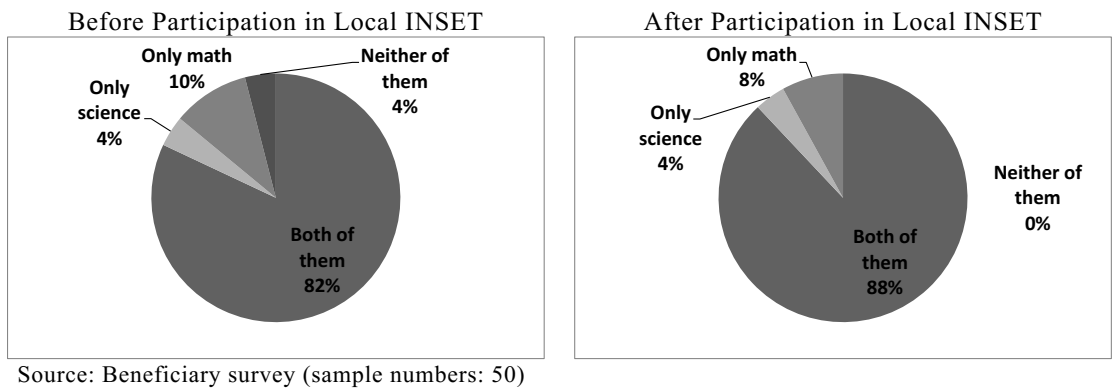


Figure 6: Participants' Preparation of Lesson Plans for Science and Mathematics Before and After Participation in Local INSET

More than 90% of participants responded that their teaching skills were 'Much improved' with the rest responding 'Improved' after participation. There were no responses of 'Not improved' and 'Not improved at all' (Figure 7). Furthermore, more than 90% of participants responded that they shared the contents of Local INSET with their fellow teachers (Figure 8).

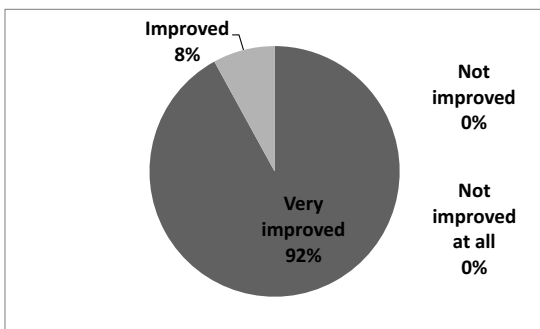


Figure 7: Improvement in Teaching Skills after Participation in Local INSET

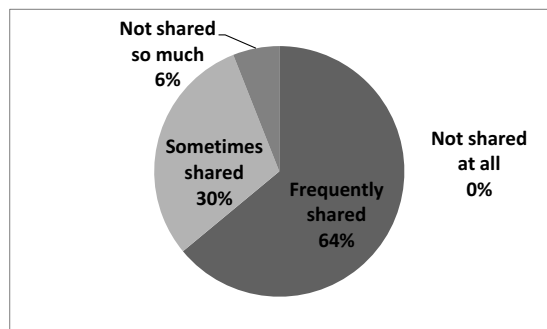
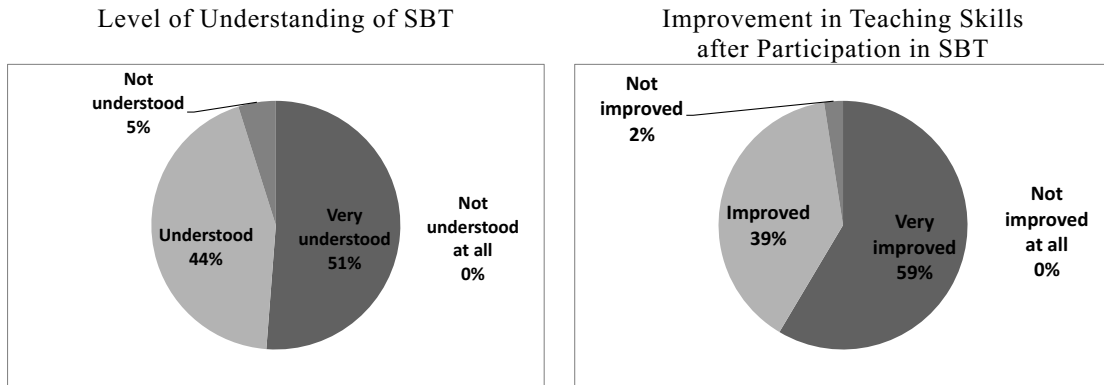


Figure 8: Frequency of the Sharing the Contents of Local INSET with Fellows

(2) Survey Results for Non-participants

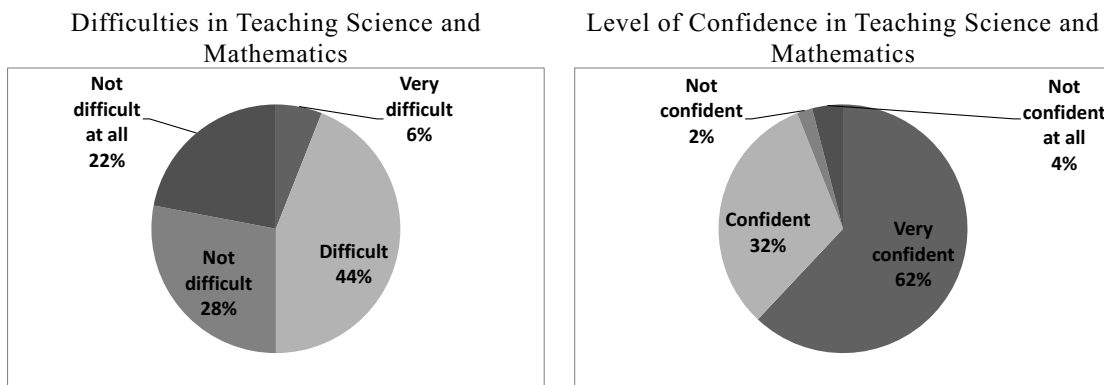
Forty one out of fifty non-participants participated in SBT as shown in Table 8. Out of these, 90% responded that they understood SBT and that their teaching skills had improved after participation in SBT (Figure 9).



Source: Beneficiary survey (sample numbers: 41)

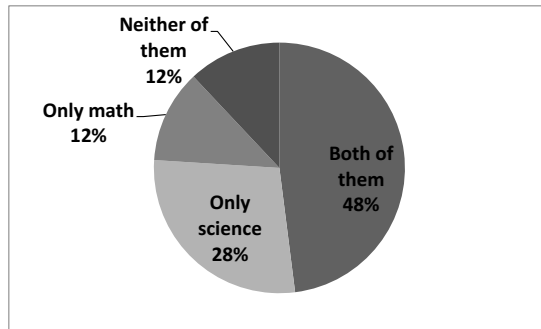
Figure 9: Non-participants' Level of Understanding of SBT and Improvement in Teaching Skills after Participation in SBT

Figure 10 and Figure 11 show the current difficulties and level of confidence in teaching science and mathematics as well as the preparation of lesson plans for non-participants. Compared to participants after participation, more teachers responded that they had difficulty and little confidence in teaching science and mathematics and that they did not make lesson plans.



Source: Beneficiary survey (sample numbers: 50)

Figure 10: Non-participants' Difficulties and Level of Confidence in Teaching Science and Mathematics

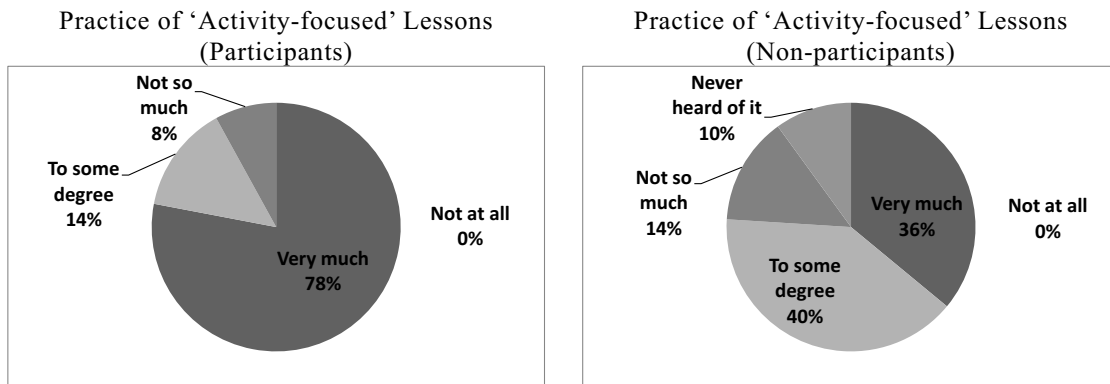


Source: Beneficiary survey (sample numbers: 50)

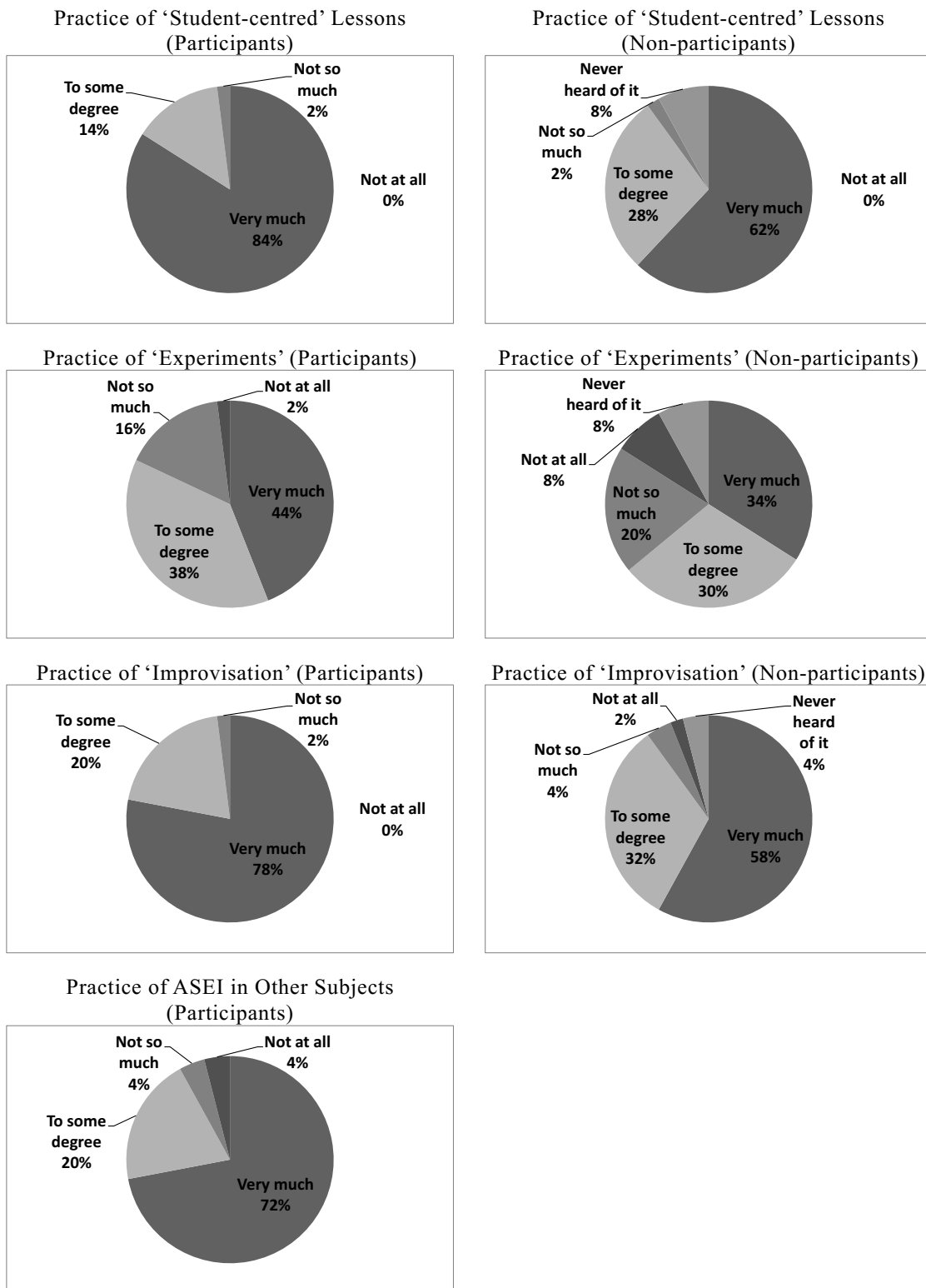
Figure 11: Non-participants' Preparation of Lesson Plans for Science and Mathematics

### (3) Practice of ASEI-PDSI by Participants and Non-participants

Figure 12 shows the level of practice of ASEI-PDSI in science and mathematics lessons per each item of ASEI for participants and non-participants<sup>12</sup>. Of the participants who responded, 80%-90% said they practiced the four items of ASEI 'Very much' or 'To some degree.' Furthermore, 70%-80% of non-participants responded 'Very much' or 'To some degree', although their practice levels are rather lower than the levels of participants. Practice by 70%-80% of non-participants could be regarded as an effect of SBT.



<sup>12</sup> PDSI of ASEI-PDSI indicates the implementation cycle of lessons and is not applicable to the judgement on practicing or not practicing, so the level of practice is shown with each item of ASEI.



Source: Beneficiary survey (sample numbers: 100)

Figure 12: Participants' and Non-participants' Practice of ASEI in Teaching Science and Mathematics

#### (4) Results of Interviews with Headmasters and Supervisors

According to the interviews with headmasters of 36 schools, out of 50 schools visited for the beneficiary survey, 35 out of the 36 had implemented SBT for SMASE INSET and 29 schools had done so more than once per term at least (the reason for one school having not implemented SBT was that the school is limited in size and number of teachers). Furthermore, 35 out of 36 headmasters regularly monitored lessons as well as checking the practice of ASEI by teachers. In response to a question on whether teachers' teaching skills were improved by SMASE, most of the headmasters recognized an improvement in teaching skills, with 29 of them responding 'improved very much,' 5 of them responding 'improved to some degree' and 1 of them responding 'not improved much.'

In addition, according to an interview with 10 supervisors belonging to the 5 states (2 supervisors for each state), all the supervisors responded they had known about SMASE INSET as well as the contents of ASEI-PDSI. Regarding the practice of ASEI-PDSI by teachers, they responded that while the practice level varied from teacher to teacher, the majority of teachers who had participated in Local INSET or SBT conducted lessons based on ASEI-PDSI. They also provided examples of some teachers conducting better lessons than trainers did. Teachers also actively practiced the ASEI-PDSI approach in lessons for other subjects besides mathematics and science. The reason for teachers not practicing is that practice is not mandatory (no regulations for promotion or pay for practice) and that it is difficult to encourage practice on the part of individual teachers who are indifferent to ASEI-PDSI. Another opinion from the supervisors was that full-level practice of ASEI-PDSI cannot be realized soon after participation in SMASE INSET but comes only gradually with a series of experiences in lessons. Therefore, it is difficult to clearly evaluate whether or not it is practiced and it is important to evaluate the level of practice with a long-term perspective.

#### (5) Specific Examples of Qualitative Effects of the Project

Specific examples of changes among teachers and pupils as well as issues surrounding the practice of ASEI-PDSI are shown as the qualitative effects of the project, which were obtained from the ex-post evaluation.

## **Specific Examples of Changes and Issues surrounding the Practice of ASEI-PDSI**

### **Examples of Changes among Teachers**

- Teachers have had attitudinal changes in teaching, using activity-oriented and learner-centred approaches. Their lesson plans as well as teaching skills have also been improved.
- Some teachers have developed better confidence in teaching mathematics and science and have become able to handle even some topics that were perceived to be difficult.
- They have encouraged pupils to actively participate in lessons by asking them for feedback and not to keep speaking in their lessons.
- They have learned the learner-centred approach at teacher's colleges, but learned only the concept. The practical approach has been learned through participation in training.
- They have newly learned the utilization of improvisation (development of teaching materials) with resources from local materials.
- They have applied the ASEI-PDSI approach in other subjects such as social studies.

### **Examples of Changes among Pupils**

- Pupils' attendance rates have increased.
- Pupils have become more interested in learning.
- Pupils' understanding of mathematics and science has increased, showing positive responses to lessons.
- Pupils have developed curiosity about topics of mathematics and science with the participatory approach.
- It is reported that pupils' examination scores in science and mathematics at school have increased.
- Pupils have actively and positively participated in lessons without showing hesitation.
- Pupils have reduced feelings of dislike of mathematics.
- Group working has helped pupils to understand lessons more quickly.

### **Issues in Practicing ASEI-PDSI**

- Lesson preparation (such as making lesson plans) takes more time. Lesson hours are shorter due to more talking by pupils in lessons.
- Laboratories and materials of science is still lacking. Teaching aids have not always been available.
- Group work is difficult due to the bad physical conditions of the classrooms (the classrooms are too small, there are too many pupils etc.)
- There are some cases that it is not easy to practice the approach in lessons for the lower grades of primary school.
- It is difficult to fully practice the approach having only participated in SBT due to not full understanding ASEI-PDSI.

Source: Beneficiary survey (sample numbers: 100), interviews with headteachers and supervisors in the five states for the beneficiary survey



In light of the above, the levels of achievement of the two indicators set for the Overall Goal were favourable at the time of the ex-post evaluation. In particular, it was confirmed that more than 80% of primary school teachers who had participated in Local INSET practiced ASEI-PDSI in mathematics and science lessons while more than 70% of teachers who had not participated practiced it. These had participated in SBT and learned from their peers. This is based on the results from the limited area of the five states where the beneficiary survey was conducted. However, in sum, the general level of teaching skills of primary school teachers has improved and the level of achievement of the Overall Goal as of the time of the ex-post evaluation was favourable.

#### 3.2.2.2 Other Positive and Negative Impacts

While the Super Goal of the project was “upgrading the capability of primary school pupils in mathematics and science education in the country,” a measurement of the academic performance of primary school pupils in mathematics and science had not been conducted in Nigeria as of the ex-post evaluation. There are no exit examinations for public primary schools or entrance examinations for public secondary schools in Nigeria and it was impossible to collect verifiable data on changes in academic performance in mathematics and science in the ex-post evaluation. According to interviews with SUBEB, State Trainers and supervisors in the five states where the beneficiary survey was conducted, it was reported that some pupils in their states had accomplished good results in subject contests in mathematics and science at national level. However, it is not clear whether this was an effect of this project or not.

In addition, according to the interviews above, it was also reported that some State Trainers were lecturers at teachers’ colleges in some states where they had explained part of SMASE ISNET to their fellow lecturers as well as directly teaching the contents of training to their students.

There were no reports of any serious negative impacts during the project period or after the project completion, and it is unlikely that any negative impact of the project will emerge in the future.

This project largely achieved Project Purpose 1: enhancement of the ability of primary school teachers to conduct student centred lessons in mathematics and science in the pilot states as well as Project Purpose 2: enhancement of the ability of State Trainers as INSET providers in primary mathematics and science education in the non-pilot states. In addition, the level of achievement of the Overall Goal is also favourable since

SMASE INSET has been continuously implemented by the Nigerian side since project completion. It has been confirmed that, in the areas where Local INSET were implemented, more than 70% of primary school teachers practiced ASEI-PDSI in their mathematics and science lessons and the general level of their teaching skills had improved whether or not they had participated in Local INSET so that the planned effects had been observed. Therefore, effectiveness and impact of the project are high.

### 3.3 Efficiency (Rating: ②)

#### 3.3.1 Inputs

<b>Inputs</b>	<b>Plan</b>	<b>Actual</b>
(1) Experts	0 Long-Term 5 Short-Term (-)	0 Long-Term 10 Short-Term (87 MM)
(2) Trainees received	No description	27 persons
(3) Equipment	Computer, Copy machine, etc.	PC, Copy machine, Projector, Printer, etc.
(4) (Others)	No description	Approx. 75 million yen
Japanese Side Total Project Cost	497 million yen	520 million yen
Nigerian Side Total Project Cost	Approx. 2 billion NGN (1.2 billion yen at the exchange rate at the time of planning)	Approx. 430 million NGN (as of the terminal evaluation, 260 million yen at the exchange rate at the time of evaluation)

\* MM stands for man month.

#### 3.3.1.1 Elements of Inputs

The project inputs including the dispatch of experts, training and the provision of equipment from the Japanese side were as planned. While the number of experts dispatched was ten compared with the planned five, no additional input of experts was made since more than one expert was in charge of the same assignment (their assignment periods were, however, added due to the extension of the project period).

The total project cost on the Nigerian side was unclear as so many implementing agencies were engaged in the project as well as SMASE INSET having been continuously implemented in Nigeria even after project completion. It was therefore quite difficult for the respective agencies to clearly distinguish the cost they had spent by the end of the project and the cost they spent after project completion. On the other hand, the approximate cost calculated at the terminal evaluation in February 2013 was 430 million NGN, which was considerably lower than the planned budget of 2 billion NGN.

While it was planned that 90% of the total cost for INSET implementation was to be

borne by the Nigerian side, it was not disbursed as planned, as described above. Due to this, the accumulated total number of participants in Local INSET in the pilot states was 43,000, compared to the three times of 70,000 participants (210,000 for the accumulated total number) in the original plan. Similarly, the accumulated total number of participants in National INSET for the non-pilot states was 413, compared to the three times of about 400 participants (1,200 for the accumulated total number) in the original plan. Thus, the actual outputs of the project were less than the planned outputs, which was caused by the decrease in inputs (spending) on the Nigerian side<sup>13</sup>.

#### 3.3.1.2 Project Cost

As described above, the project cost rather exceeded the plan with an actual cost of 520 million yen as against a planned cost of 497 million yen. This additional cost was caused by an additional period of dispatch of experts due to the 7-month extension of the project period.

Therefore, the project cost was higher than planned.

#### 3.3.1.3 Project Period

The actual project period exceeded the plan with an actual period of 43 months as against the planned period of 36 months. The extended project period was caused by the significant delay in the INSET schedule. It was impossible to implement National or Local INSET as planned due to the insufficient allocation of INSET funds. While it was planned that training materials for Cycles 1, 2 and 3 would be revised based on the implementation results of the respective Cycles, the revision was also delayed due to the delay in the INSET schedule.

Therefore, the project period was longer than planned.

Both the project cost and the project period exceeded the plan. Therefore, efficiency of the project is fair.

### 3.4 Sustainability (Rating: ②)

As shown in Figure 2 in “1.1 Background,” it was planned that State and Local INSET in the non-pilot states would be implemented by Nigeria on its own accord after the project completion. Neither National INSET for the non-pilot states nor Local INSET in the pilot states, however, had been completed up to Cycle 3 by project completion. It was decided that these INSET would be continuously implemented up to Cycle 3 in addition

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<sup>13</sup> Calculation based on the actual cost from the Nigerian side and the number of INSET participants as of the terminal evaluation. The rate of the actual cost to the planned cost is 21% whereas the rate of the number of participants to the planned number is 15% for Local INSET as well as 28% for National INSET.

to the State and Local INSET in the non-pilot states. Furthermore, estimating based on progress at the time of project completion, it was predicted by those involved that it would take approximately 10 years after project completion to complete all the remaining INSET.

The series of SMASE INSET was planned to be completed not only by this project. In addition, it was estimated at the time of the ex-post evaluation that this would take 7-8 years more to complete. The sustainability of the project effects should be therefore examined in this ex-post evaluation mainly from the perspective of whether SMASE INSET have been continuously implemented by Nigeria's own accord after project completion and whether Local INSET in the respective states is to be implemented up to Cycle 3. The ex-post evaluation mainly reviewed whether there were any special problems in the policy and institutional, organizational, technical and financial aspects which are necessary to continuously implement SMASE INSET in Nigeria.

#### 3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

The national development plan "Nigeria Vision 2020" as well as education sector policies such as the "National Policy on Education" and the "National Teacher Education Policy" are still effective as of the ex-post evaluation. Furthermore, the federal government continuously and strongly supports the implementation of SMASE INSET, which has been actually continuously implemented in Nigeria since project completion as described above.

Nigeria has a federal system and both the federal and state governments are responsible for educational administration in the country. The central (federal) government agencies among the project implementing agencies include FME, NTI, NCCE and UBEC and the respective SUBEBs are placed under UBEC while LGEA are placed in each LGA.

At the time of the ex-post evaluation, the introduction of SMASE INSET into teacher-training courses and levels of lower and upper secondary education was being considered among the implementing agencies at the central level. However, priority was given to the completion of current SMASE INSET as it is estimated that it will take 7-8 years more to complete SMASE INSET for primary school teachers throughout the country.

The state government policies on SMASE INSET differ from state to state; some states have a positive stance on implementing SMASE INSET and others are less positive. Nigeria experienced changes of government in 2015 and the state governor as well as the top of SUBEB were changed in some states. This meant that some states which were positive about SMASE INSET became negative and vice versa. The only

state which has not implemented SMASE INSET by policy is Lagos State. All other states have continued implementation after project completion since the federal government has a policy on the implementation in every state as well as SMASE INSET itself has been implemented by funds disbursed from UBEC to each state.

#### 3.4.2 Organizational Aspects for the Sustainability of Project Effects

The implementation system of SMASE INSET has not changed since project completion and National, State and Local INSET have been implemented with almost the same system as that at the time of project implementation.

At the central level, members of the National Coordinating Unit (NCU) which consists of the central implementing agencies have been continuously engaged in SMASE INSET. Currently 20 officers are engaged in SMASE INSET in FME which leads NCU and the SMASE Coordinator of FME, who has been in charge since the time of the Phase 1 Project, has been continuously in charge of the general management of SMASE INSET, holding regular meetings with NCU members and listening to their opinions. There is no special organizational problem at the central level and no special management problems have been reported from the NCU members to FME.

At the state level, SUBEB officers (one officer called the “SMASE Desk Officer” and other officers in charge) have been mainly engaged in SMASE INSET and they have managed (implemented and monitored) State and Local INSET in the states (except for Lagos State). According to the “SMASE Nigeria INSET Guidelines” which show the administrative structure and procedures of SMASE INSET and which were made during project implementation, it is planned that Local INSET in the respective states will be managed by Zonal Implementation Committees and Zonal Coordinating Units to be established in each ‘Zone’ consisting of some LGAs. However, while it was planned that all primary school teachers in the country would participate in Local INSET, a decrease in the number of participants in Local INSET due to insufficient INSET funds has made it unnecessary to manage Local INSET per Zone and the SUBEB officers in charge have managed Local INSET in the same way as State INSET. According to the SMASE Desk Officers in the pilot states, FCT and Kogi, no special management problems in the management of State and Local INSETs have been identified.

SBT introduced during project implementation has also been introduced in the Guidelines above. Primary schools, however, are not obliged to implement SBT and the frequency and method of implementation of SBT are not specified. This has resulted in no information on the number of schools in practice nor on the situation of the practice of SBT in the respective states. According to the SMASE Desk Officers, while SBT has

been practiced in most schools in the pilot states and FCT, there is no information on the number of schools practicing SBT in Kogi State.

#### 3.4.3 Technical Aspects for the Sustainability of Project Effects

According to the officers in charge of SMASE INSET in FME, UBEC, the pilot states, FCT and Kogi, as well as National and State Trainers and Core Teachers, there has been no special technical problem in implementing (planning, managing, monitoring and evaluating) SMASE INSET. While there is a certain level of difference in skills among the respective National and State Trainers and Core Teachers; e.g. some Core Teachers facilitate Local INSET more effectively than National and State Trainers do, trainers at the national, state and local levels have sustained the general technical level necessary for INSET trainers.

In addition, those involved in SMASE INSET have participated in the JICA Knowledge Co-Creation Program (Group and Region Focus) including courses such as “Improving Teaching Methods for Science and Mathematics in Primary Education” even after project completion. According to FME, the participants in the program courses were selected from a wide range of candidates, including primary teachers, based on recommendations from the respective SUBEBs. Furthermore, participation in the program courses has greatly contributed to motivating people concerned with SMASE INSET in addition to learning the program contents.

#### 3.4.4 Financial Aspects for the Sustainability of Project Effects

Most budgets for the implementation of SMASE INSET were disbursed from the Teacher Professional Development Intervention Fund (hereinafter called the “TPD Fund”) by UBEC during and even after project implementation<sup>14</sup>. The TPD Fund is a fund for the capacity development of teachers to be almost uniformly allocated from UBEC to all the states in the country every year. While the amount allocated to each state slightly differs depending on the size of each state, around 150 million Naira (approximately 80 million JPY) has been allocated to each state every year.

While it was planned that the budgets for implementing State and Local INSET in the respective states would be borne mainly by the states themselves, some states, such as Kaduna, fell behind in implementation due to the failure in fully secured SMASE INSET fund<sup>15</sup>. Following this, a regulation on prioritizing in SMASE INSET was added to the Guidelines for Teacher Professional Development Programmes made by UBEC during the project period in 2012, which regulates how to use the TPD Fund for the

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<sup>14</sup> Disbursed from the states’ own educational budget for some states, their rates are small.

<sup>15</sup> Refer to Footnote 6.

states. Furthermore, the Guidelines were revised after project completion in 2014 and a new regulation added so that the SUBEB should include SMASE INSET in their action plans to be submitted to UBEC when applying for the fund. With this new regulation, UBEC has the policy not to disburse the fund to a state where SMASE INSET is not included in its action plans (except for Lagos)<sup>16</sup>. Table 9 and Table 10 show the total amount of TPD Fund disbursed from UBEC to all SUBEBs as well as the amounts of the Fund received and spent for SMASE INSET in the pilot states, FCT and Kogi in the last five years.

Table 9: Total Amount of TPD Fund Allocated from UBEC to All SUBEBs

Unit: Thousand NGN				
2012	2013	2014	2015	2016
5,180,000	6,290,000	5,957,000	4,440,000	6,290,000

Source: Questionnaire response from UBEC

Table 10: Amounts of TPD Fund Received and Expended for SMASE INSET in the Pilot, FCT and Kogi States

Unit: Thousand NGN						
States	Items	2011	2012	2013	2014	2015
Kaduna	TPD Fund received	161,000	161,000	161,000	161,000	120,000
	Expenditure on SMASE	60,000	30,000	30,000	25,000	20,000
Niger	TPD Fund received	150,000	140,000	170,000	160,000	120,000
	Expenditure on SMASE	76,572	46,000	59,165	47,186	8,657
Plateau	TPD Fund received	150,000	140,000	170,000	161,000	120,000
	Expenditure on SMASE	95,557	-	47,440	-	46,334
FCT	TPD Fund received	150,000	170,000	170,000	161,000	120,000
	Expenditure on SMASE	300 <sup>Note 2</sup>	29,973	29,221	27,637	13,884
Kogi	TPD Fund received	NA <sup>Note 3</sup>	140,000	170,000	161,000	120,000
	Expenditure on SMASE	7,500	15,000	14,000	20,000	20,000

Source: Questionnaire responses from the respective SUBEBs

Note 1: The amounts above are based on the results of questionnaire responses from the respective SUBEB, so some of amounts are based on an approximate calculation. ‘-’ in the table means that no INSET was conducted that year.

Note 2: State INSET has been implemented in FCT from 2012, so the expenditure on SMASE INSET in 2011 was only for the attendance fees for National INSET and the implementation cost for workshops.

Note 3: The amount of TPD Fund received in Kogi in 2011 was not available. The expenditure on SMASE INSET was disbursed from the state budget.

As seen above, the respective states implemented SMASE INSET (dispatch of State Trainers to National INSET<sup>17</sup> as well as implementation of State and Local INSET)

<sup>16</sup> The TPD Fund is the capacity development fund for all teachers including primary and lower secondary education teachers, and is not all available for SMASE INSET in the respective states. For example, the “Education Sector Support Programme in Nigeria (ESSPIN)” (2008-2017) funded by DFID has been conducted to develop effective planning, financing and delivery systems that will improve the quality of primary education in Enugu, Jigawa, Kaduna, Kano, Kwara and Lagos where TPD fund has been used for activities for ESSPIN as well as for SMASE INSET.

<sup>17</sup> The respective SUBEB have paid the participation fee for National INSET to NTI where National INSET is implemented.

using the TPD Fund even after project completion. All the states, however, have insufficient INSET budget for all of the primary school teachers in the states and have had to decrease the number of participants. Besides, according to the SMASE Desk Officers of the five states, while the monitoring cost for SMASE INSET has been budgeted as part of overall INSET budget, monitoring cost has not been secured as they have prioritized the implementation cost for INSET.

Meanwhile, the necessary budget for supervisors to monitor teachers' lessons in their schools has been budgeted in the regular budget of the state or LGA where they belong. According to 10 supervisors in the five states, however, there have been insufficient monitoring budgets together with difficulties in frequently visiting the schools in their charge. It has also been difficult for them to precisely check the practice of ASEI-PDSI using an original checklist as well as to carefully supervise teachers since they have originally monitored teachers' lessons based on the checklist used in their states or LGA.

Furthermore, according to 10 State Trainers in the five states, a request was made to decrease the gap period between National and State INSET since a gap of almost one year had arisen from the time they participated in Cycle 1 of National INSET to the time they facilitated for Cycle 1 of State INSET and they were liable to forget the details of contents. This was mainly caused by a gap in the disbursement of the TPD Fund; it takes around two years for the respective SUBEB from the time of applying for their TPD Fund to UBEC to the time of receiving it, which has resulted in their being unable to implement State INSET immediately after National INSET. This delayed disbursement of budget, however, is quite usual in Nigeria and the disbursement of a regular budget is frequently delayed in ministries and agencies. This issue is not easily solved due to it being a common issue for government agencies in Nigeria.

Thus there is a financial problem in the continuous implementation of SMASE INSET.

Some minor problems have been observed in terms of the financial aspects. Therefore, the sustainability of the project effects is fair.

#### **4. Conclusion, Lessons Learned and Recommendations**

##### **4.1 Conclusion**

The objectives of this project were 1) to enhance the ability of primary school teachers of mathematics and science in the three pilot states by conducting INSET on teaching methods for student centred lessons and 2) to enhance the ability of State Trainers as INSET providers in primary mathematics and science education while establishing a system to implement INSET in other states across the country. Through the achievement



of the objectives, the project aimed to raise the general level of teaching skills of primary school teachers in mathematics and science education in the country and to improve the future capability of primary school pupils in mathematics and science education.

This project was consistent with the development plan and development needs of Nigeria, as well as with Japan's ODA policy in view of quality improvement of education. Therefore, the project relevance is high. The project contributed to enhancing both the abilities of primary school teachers of mathematics and science in the three pilot states and State Trainers as INSET providers in primary mathematics and science education in other states. In addition, it is also confirmed that the general level of teaching skills of primary school teachers in mathematics and science education had been enhanced in the area where INSET was introduced as of the time of the ex-post evaluation. The project therefore has produced its desired effects including those effects which were expected for the future, the result being that its effectiveness and impact are high. On the other hand, both the project cost and the project period exceeded the plan due to insufficient and delayed allocation of INSET funds which frustrated the planned implementation of INSET schedule. Thus the efficiency of the project is fair. The sustainability of project effects is also fair since the funds for INSET implementation and monitoring were still insufficient due to its implementation nationwide. However, no special problem has been identified in the institutional, organizational and technical aspects.

In light of the above, this project is evaluated to be satisfactory.

## 4.2 Recommendations

### 4.2.1 Recommendations to the Implementing Agency

- (1) While the implementation budget for National, State and Local INSET is secured from the TPD Fund by UBEC to a certain extent, the respective SUBEB basically have to disburse the monitoring costs for SMASE INSET from their regular budget. Some SUBEB have difficulty in fully monitoring INSET implemented in their states and in obtaining information on the progress and effects of INSET due to the insufficient monitoring budget. The Guidelines for Teacher Professional Development Programmes stipulates that SMASE INSET should be included in action plans for the TPD Fund. It is recommended that FME issue a circular notice to encourage the respective state governments to allocate a budget for the monitoring of SMASE INSET from their state budgets in order for the respective SUBEBs to request their state governments for the monitoring budget in their state regular budgets.

- (2) While SMASE INSET has been continuously implemented since project completion in Nigeria, the measurement of academic performance in mathematics and science by primary school pupils has yet to be conducted, although this is set as an indicator for the project super goal. Only three years have passed since project completion and it is estimated that completion of SMASE INSET will take 7-8 years as of the ex-post evaluation. This leads to prioritization in INSET implementation to the measurement of project impact. It is desirable that changes in academic performance in mathematics and science by primary school pupils are measured in the future in order to obtain the specified information on the effects of INSET. It is recommended that the members of the National Coordinating Unit consider how and when they should measure the changes in the academic performance of primary school pupils in mathematics and science and make future plans for the measurement.
- (3) SBT was introduced in the project in addition to the cascade-system INSET and it was found at the beneficiary survey conducted by the ex-post evaluation that 80% of primary school teachers who had not participated in Local INSET had participated in SBT for SMASE INSET in the three pilot states, FCT and Kogi. Furthermore, it was confirmed that participation in SBT only had similar effects to participation in SMASE INSET. The frequency and method of SBT, however, have not been uniform and the quality of SBT differs from school to school. To improve the general quality of SBT as well as to maintain the level among schools, it is recommended that the respective SUBEB and LGEA promote the implementation of SBT at primary schools in their states and that LGA also encourage supervisors to add guidance on matters such as the frequency and method of SBT, as well as advice on the content of training etc. in their monitoring activities at schools.

#### 4.2.2 Recommendations to JICA

None

#### 4.3 Lessons Learned

- (1) Introducing alternative means in cases where there are difficulties in the planned implementation of project activities due to financial constraints

Although in the original project plan basically all primary school teachers should have participated in SMASE INSET where the implementation of SBT was not included, it was found half way through the project that it was financially impossible to pay for all the teachers. As a countermeasure for some teachers being unable to participate in

INSET, SBT was introduced where some participants shared what they learned in INSET with their peers. To promote this sensitization, workshops for those involved in SMASE INSET were held as part of the project activities and all primary school headteachers and supervisors in the pilot states were invited to these workshops and encouraged to implement SBT for SMASE INSET in their schools and states. As a result, it was confirmed at the ex-post evaluation that SBT had been implemented in almost all schools where there were participants in SMASE INSET in the pilot states and that the implementation in the non-pilot states such as FCT had been encouraged by UBEB, headteachers and supervisors. Thus, even if there is a financial constraint which means only a limited number of teachers are able to participate in INSET, it is possible to solve this constraint by introducing alternative means of low-cost training such as SBT, which enabling the dissemination of the training contents to more and more teachers.

(2) Necessity of careful and thorough examination and consideration in setting the project scope

The project site was the whole of Nigeria and the Overall Goal was to upgrade the teaching skills of all primary school teachers in the country through participation in SMASE INSET. Nigeria, however, is the most populated country in Africa and the number of schools and teachers at the primary education level is huge. They exist in every LGA, even where schools at the secondary and higher education levels do not. Furthermore, Nigeria has not a centralized but a decentralized system with a federal governing structure. Implementing nationwide training in a single uniform way in such a country is difficult for the central government agencies as they experience problems in obtaining information on the situation of the implementation of training and consolidating the management of it. It is also quite difficult to firmly establish training systems and contents through the wide and shallow implementation. In addition, as described in the lesson learned above, the cost of implementing INSET is huge with primary school teachers across the country. It can be thus seen that to implement unified INSET for primary school teachers in the whole country is equal to a national program and the size of the project site and the number of target persons were too much for a single technical cooperation project of usual size. It is therefore important that the project scope is carefully examined at the project planning with thorough consideration of the conditions of the recipient country including the target number, the affordable cost burden, the governance system, etc.