

#### 4. プロジェクト・ドキュメント・ミニッツ

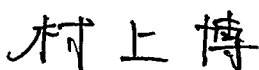
### プロジェクト・ドキュメント・ミニッツ

**THE MINUTES OF MEETING  
BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
THE REPUBLIC OF SOUTH AFRICA  
ON  
JAPANESE TECHNICAL COOPERATION FOR THE PROJECT ON  
MPUMALANGA SECONDARY SCIENCE INITIATIVE PHASE II**

Resident Representative of Japan International Cooperation Agency (hereinafter referred to as "JICA") South Africa Office had a series of discussions with the South African authorities, for the purpose of working out the details of the technical cooperation program concerning the Project on Mpumalanga Secondary Science Initiative (MSSI) Phase II (hereinafter referred to as "the Project").


As a result of the discussions, Resident Representative of JICA South Africa Office and the South African authorities concerned agreed to summarize the matters referred to in the document attached hereto as a supplement to the Record of Discussions (hereinafter referred to as "R/D").

Pretoria, April 1, 2003



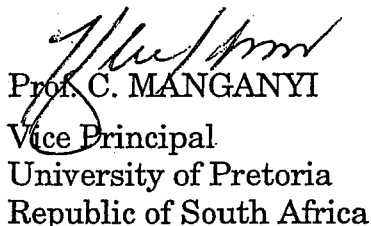
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## THE ATTACHED DOCUMENT

### I. Project Design Matrix (PDM)

JICA and the South African side agreed on the PDM for the Project as listed in ANNEX I.

### II. Project Document

JICA and the South African side agreed on the Project Document as listed in ANNEX II. Both sides confirmed that the Project Document stipulates details for the implementation of the Project, based upon the experience of the Phase I (period from November 1999 to March 2003) and all the discussions among the collaborating partners.

### III. Other Relevant Issues

JICA and the South African side discussed and agreed on the following issues for smooth and successful implementation of the Project.

#### 1. Contribution by JICA

The Project will be implemented based upon the same structure and manner of the Phase I. JICA's contribution to the Project would be secured in the same level as in Phase I.

#### 2. Necessary Arrangements by the Department of Education, Mpumalanga

In order for the Project to be authorized and recognized among the entire province and to be implemented duly, Mpumalanga Department of Education shall ensure that the Project schedule, such as workshops is registered in the official annual plan of the Department.

From the viewpoint of future perspective and sustainability, Mpumalanga Department of Education agreed to take necessary arrangements for further budget allocation of these activities.

#### 3. Contribution by the University of Pretoria

In order to achieve the Project objectives, both sides agreed that the role of University of Pretoria is quite important, in terms of the quality assurance. University of Pretoria shall conduct the activities properly and make efforts to disseminate the Project outcomes nationwide.

#### 4. Revision of the Documents

Both sides confirmed that all the above mentioned documents, such as PDM and Project Document, would be the subjects to be revised, in respect of any matter that may arise, by the mutual consultation among collaborating partners.

ANNEX I PROJECT DESIGN MATRIX (PDM)

ANNEX II NARATIVE PROJECT DOCUMENT




# PROJECT DOCUMENT

## Mpumalanga Secondary Science Initiative (MSSI): Phase 2

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# Mpumalanga Secondary Science Initiative (MSSI): Phase 2

## I. Background

The urgent need to improve the quality of mathematics and science education, particularly among the underprivileged communities in South Africa is well documented. The acute shortage of well grounded mathematics and science high school graduates impacts adversely on the country's ability to advance economically and technologically. The problem prompted the national government to prioritize the teaching of mathematics, science and technology. The former President, Dr. Nelson Mandela, in what became known as the President Educational Initiative, made a call to the international community to assist South Africa in this area.

Japan International cooperation Agency (JICA) has been providing technological and financial support to developing secondary mathematics and science education in Mpumalanga Province through the Mpumalanga Secondary Science Initiative (MSSI). MSSI's uniqueness lies in its attempt to establish a school-based educator development and support system. The emphasis on mathematics and science education aims at promoting essential skills for technological advancement and industrial expansion, which should stimulate economic development and global competitiveness. This is a partnership project with three key role-players, namely the Mpumalanga Department of Education (MDE), JICA and the University of Pretoria (UP). Started in November 1999 as a three-year project, concentrating on the Senior Phase of the General Education and Training band, it was extended five extra months to the end of March 2003.

Since November 2001 a number of consultations have been held among the three parties to assess the progress made and identify the gaps in the implementation of the project. JICA carried out its evaluation of the project in June-July 2002. The three parties generally agreed on the following:

- (1) Significant progress has been made in the establishment of a Province-wide system of school-based INSET for mathematics and science educators through the concerted work of the corps of Curriculum Implementers (CIs) whose technical and organizational capacities have been strengthened considerably with the support from JICA and UP teams. In some schools the systemic impact spilled over into other subject areas, creating whole school development effect.
- (1) Some 40~50 schools, or around 15% of the schools participating in MSSI, have managed to establish a solid system of school-based In-Service Training (INSET), conducting one or more such activities per month, based on strong Heads of Department (HOD) leadership, active teacher participation and solid school management support. Some of these schools have played a leading role in organizing cluster INSET activities with neighboring schools.
- (1) During the last year, however, the organizational change in the department and the new restriction on workshop attendance by teachers combined to make it increasingly difficult to implement the cascade training activities. As a result, the intensity of the school-based INSET activities declined in most of the districts. Furthermore, it was realized that the impact of the school-based INSET activities had not yet reached the classrooms for a number of reasons, including, in particular, the limited school-level support by the CIs who were charged with

excessive tasks and were also affected by the organizational changes in the department.

(1) MSSSI should be extended to ensure that the work already started should reach the remaining schools and that the impact of the school-based INSET activities should reach the learners in classrooms in the MSSSI participating schools. The extended program, or Phase 2 of MSSSI, should encompass efforts to integrate MSSSI activities into the regular program and activities of the department. They should provide a greater opportunity for continued professional development of CIs and teachers in the field of maths and science. They should also address new concerns, such as the need to widen the grade coverage to include the Further Education and Training (FET) band and to incorporate market and technology related learning in the maths and science curriculum.

(1) The three collaborative partners are satisfied with the results, as well as the process, of work in MSSSI so far, and are committed to work together for another 3 years as its Phase 2.

Based on these considerations, the three partners have jointly elaborated the present document to serve as the Project Document for Phase 2 of MSSSI.

## II. Project Goals and Objectives

The long-term goal of the Mpumalanga Secondary Science Initiative is to ensure that secondary school learners acquire enhanced skills mathematics and science.

The medium-term goal is to improve the quality of teaching in mathematics and science in the province through enhancement of the capacity and experience of the educators.

The project goal is to establish a Province-wide system of continued, in-service training for mathematics and science educators so that this capacity enhancement effort may evolve into a sustained practice.

## III. Scope of the Project

### 1. Duration

MSSSI Phase 2 is to start in April 2003 with a three year time frame and end at the end of March 2006.

### 1. Project Initiator/Owner and Cooperating Organizations

MSSSI is a project conceived and promoted by Mpumalanga Department of Education (MDE). It is supported financially and technically by the Japanese Government through its technical assistance agency, the Japan International Cooperation Agency (JICA). MSSSI also draws heavily on the technical support of the Centre for Science, Mathematics and Technology Education of the University of Pretoria.

The project is to be implemented by an MSSSI Coordinator Team consisting of Department Coordinators to be designated by Mpumalanga Department of Education, a JICA Project Coordinator stationed in Mpumalanga Province and a University of Pretoria Coordinator for MSSSI, who will report to their respective authorities.

## **1. Target grades, schools and groups of mathematics and science educators**

### **(1) Target Grades: Grades 8~12**

MSSSI targets mathematics and science teaching in the Province's secondary schools – that is, Grades 8 and 9 in the Senior Phase of the GET Band and Grades 10~12 in the FET Band.

### **(2) Target Schools: All Secondary Schools in the Province**

The geographical coverage of MSSSI Phase 2 will be the entire Province from the beginning to the end, encompassing all secondary schools.

### **(3) Target groups: Mathematics & Science educators, Cluster Leaders and Curriculum Implementers**

In terms of project activities, MSSSI has three groups of target population. The first and the most important group comprises the large number of mathematics and science educators working in the Province's secondary schools. The individual training needs of these teachers may vary from one another, but they are all required to go through certain retraining to prepare them for the introduction of the revised curriculum and will all benefit from continued INSET to upgrade their skills. The impact of MSSSI on this group will determine the impact on the final beneficiary of the project, the learners.

The second target group consists of a selected number of mathematics and science educators who will assume a leading role in organizing and promoting cluster-based and school-based INSET activities and in ensuring the classroom application of materials and methods learned in the various INSET activities. They may be the Heads of Department for mathematics and science in the secondary schools participating in MSSSI, or may be mathematics and science educators designated by their schools to assume the leading role. They will be invited to take part in various training schemes conducted at the regional and provincial levels, as well as at the Teachers' Centers. Some of them have already participated in and some others will participate in the study missions to Japan and join a core group of cluster leaders to promote MSSSI. They will comprise the principal actor, along with the CIs, for carrying the project forward.

The third target group consists of GET and FET CIs for mathematics and science assigned to the regions. With the help of UP and Japanese experts, they will organize training activities for the cluster leaders at the regional and provincial levels, as well as at the Teachers' Centers. They will also extend direct support to the cluster- and school-based INSET activities so as to ensure that the impact of MSSSI reaches the classroom. As such, this group constitutes the prime orchestrator MSSSI activities in the field. The training of this group will take place in two principal ways. One way is their participation in provincial level training organized by the MSSSI Coordinator Team specifically for them and selected cluster leaders. The other is through learning by doing as they take part in various activities in support of cluster- and school-based INSET.

In order for MSSSI to be effective, all these target groups must be aware that 'they are targeted' and that they all have a very important, instrumental role to play in the successful implementation of MSSSI. This may be done by creating an institutional framework for MSSSI implementation in such a way that each target group develops a 'group-consciousness'- that the members of each group feel that they belong to a 'corps' bound by a common purpose, be it at the level of Regions, clusters or schools. For shaping such an institutional framework as well as for identifying the three target groups, the Regional and Circuit-level educational authorities have a particularly important role to play. They should make a clear commitment to the promotion of MSSSI and back it up by issuing specific guidelines to that effect to all the relevant educational administrators, schools and teachers concerned, as well as to the CIs.

## **2. Principal approaches**

### **(1) Partnership-based Sustainability**

The partners in the MSSSI project are composed of three entities – the Mpumalanga Department of Education with its schools, educators, learners and all the structures that constitute the education system, the University of Pretoria whose role is to offer academic and professional support, and the JICA, backed by the University of Hiroshima and Naruto University of Education, whose role is to provide innovative and effective ways of handling science and mathematics content knowledge. This partnership is based on their continuous sharing and joint work on policy and management issues. The involvement of the University of Pretoria is envisaged to continue to give content and professional support to the educators even after the Japanese MSSSI team leaves the project

The project is owned by the Mpumalanga Department of Education because the implementation takes place at their schools. Therefore, the project should align itself with the existing educational policies on Mathematics and Science and also on the policies of teacher training in the Province. MSSSI is bringing some innovative ways of teacher training that should enhance the demands of the national policy on the implementation of the new curriculum. This means integrating the MSSSI activities to the other national and provincial initiatives. MSSSI should not be seen as a special intervention that is isolated from the existing educational programmes, but should be part of the whole. The full participation, commitment and acknowledgement of all officials at all levels of the department become crucial in the institutionalisation of MSSSI.

The educators should be the prime mover of any school reform. The involvement of the senior educators in school-based activities and the on-going support from the subject advisors and the availability of Teacher Centres and resource materials will promote and encourage the educators in schools to continue with the activities. The support and the recognition of clusters by the senior departmental officials, especially the CIs will encourage schools to continue their participation in cluster activities. If the CIs help in designing and offering quality activities that address the needs of the Cluster Leaders, the educators will continue to participate in clusters. The true ownership of MSSSI should rest with the schools where educators and learners are located. For sustainability and commitment for MSSSI Phase 2, schools should register and be expected to comply with the policies and guidelines for forming and running the clusters.

### **(2) Cascade training and the central role of CIs**

The principal characteristic of MSSSI's project approach is its reliance on cascade





model of training, in which teacher trainers, called CIs, play a critical role. As already discussed earlier, in Phase 1 the mathematics and science CIs were organized and trained to form an MSSSI trainer corps. They train the mathematics and science HODs of different schools and guide them in planning and implementing school-based INSET. As described in detail in Section IV.1 below, in Phase 2 the cascade training is to be re-organized with the aim of having a greater impact on classroom instruction of mathematics and science.

The core business of the CIs is to influence the classroom practices of the mathematics and science educators. It will be the overarching role of the CIs to guide, support, and give advice to cluster leaders and cluster participants in order to improve the quality of mathematics and science teaching in the classroom. To be more specific, the roles of the CIs are:

- To assist and promote the formation of subject specific clusters;
- To liaise with circuit managers where possible;
- To conduct workshops for cluster leaders on subject specific contents;
- To empower cluster leaders on material development adoptable for use in classroom situations;
- To empower cluster leaders on professional development and personal development;
- To visit different clusters and disseminate best classroom practices;
- To visit classes and advise where necessary;
- To undertake the sustained teaching of a class in a selected school so as to provide concrete models of teaching; and
- To ensure that non-participating schools will be exposed to MSSSI through sharing sessions.

### (3) Cluster approach to strengthening of teacher's capacity

The educators are at the actual sites of teaching and learning and they are the ones that need to deliver quality and effective materials that will impact on the teaching and learning of Mathematics and Science. They know their strengths and their shortcomings. MSSSI thus creates a non-threatening forum where educators can help each other on specific subject related matters through clusters. Research has shown that teachers learn best from each other (peer teacher learning). Educators from neighboring schools can meet and work on specific task under the guidance of the Cluster Leader, whose role is to make the educators to meet and share various information. He/ She plays a major role in facilitating and organising resources with the help of the CIs and the Teachers' Centre Managers. In cases where the cluster activities take place at the Teachers' Centres, the Japanese Volunteers should work as a team or as peers with the Cluster Leader. Participation of educators should be based on the commitment of the schools and the policies of the various clusters. The Principals of schools and the Circuit Managers should play a major role in supporting the cluster leaders in institutionalising the cluster activities to the existing provincial and school activities, e.g. circulars and plans with endorsed signatures, school stamps, etc.

The proposed idea assumes that in any given year clusters of educators with common interests will be meeting throughout the year for professional development with the aim of improving learner's achievement. For example, given an "official" cluster of ten schools, it is possible that the senior phase science educators from seven of these schools meet on a regular basis for cluster-based INSET. There might be other groupings as well, such as the FET mathematics educators from nine of the schools.

The materials developed and to be developed by the University of Pretoria and by the



Japanese universities should assist the cluster members to strengthen their capacity as educators in handling the subject content knowledge in the classroom. This should enable the MSSSI team to see the changes in classroom practices and the impact of the training to learners as they will be monitoring and assessing learner performance and the changes in the classrooms.

#### **(4) Providing individual incentives for Mpumalanga Teachers**

While MSSSI places much emphasis on group approach, it also takes into account the importance of providing individual incentives for motivating the people in the various target groups to participate actively in MSSSI activities. This consideration is especially relevant when pitted against the professional development needs of Mpumalanga educators. During Phase 1, such a scheme became a reality as the National Department of Education provided a fund to enable mathematics and science educators. However, a number of circumstances prevented the province from reaping the full benefit of the fund. In Phase 2, the University of Pretoria is expected to provide additional technical support needed to bring up newly joining CI's. The university will propose a week-long workshop for the newly appointed CIs to be funded by the Mpumalanga department of Education (e.g. through skills development funds)

In the meantime, during Phase 1, JICA started a scholarship scheme for MSSSI educators to pursue an advanced degree in mathematics and science. This scheme will provide benefit to educators in Phase 2 as well.

### **IV. Project Activities**

#### **1. New Cascade Training**

MSSSI Phase 1 has created a Province-wide structure for school-based INSET for secondary mathematics and science educators. The principal task of MSSSI Phase 2 is to make this structure function effectively and efficiently as a system so that it will lead to a major impact in the classrooms in terms of enhanced instructional capacity of the educators and improved mathematics and science comprehension of the learners. In order to cope with this challenging task, the cascade model of teacher retraining initiated in Phase 1 needs to be revised as mentioned in this chapter.

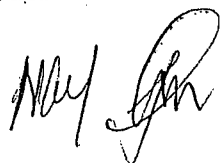
The crucial reason why the revision is needed that the organizational reform in the MDE abolished the District Office, and, with it, the momentum for effectively organizing training workshops for HODs at that level (although the Teachers' Centres still exist at the former District levels).

Secondly, the strict implementation of the training workshop hour rule for the teachers (i.e., no training during the school hours) makes it practically impossible to organize teacher training activities requiring long travels for the participants during the normal working days.

Thirdly, and on a more positive note, in order to ensure classroom application of learning materials and processes acquired by the educators through training activities, it is deemed necessary to create a supporting mechanism for school-based INSET activities that is 'closer to school', like at the level of Circuits.

Finally, and most importantly, MSSSI Phase 2 should not only recognize but also make active use of the strong initiatives taken by some schools during Phase 1 to establish regular school-based INSET activities.

It is based on these considerations that MSSSI is to adopt a revised Cascade-model



that places a major emphasis on the 'Cluster-level' INSET.

### 1.1 MSSSI cluster formation and registration

#### Cluster formation

A group of schools in a given geographical area may come together and form an MSSSI cluster with the aim of improving the quality of learners' learning and achievement by working on a common program in mathematics and science. Specific objectives for clustering may include elaboration of a co-operative and collaborative approach to professional development, development of effective approaches in mathematics and science teaching, fostering of closer ties and sharing among mathematics and science educators, joint development of outcome-based instructional approaches between GET and FET bands, fostering of innovation and resource mobilization to solve local problems and promotion of Peer Teacher Learning.

A cluster should have a Cluster Leader (CL), whose responsibility is to coordinate the activities of the cluster, including drawing up of its programme and policies and arranging for resources needed, to attend to problems encountered in the cluster, to motivate the participants, and to ensure communication with all the relevant stakeholders, including submission of reports and networking with other clusters. The CL will have a committee composed of coordinators for the different learning areas. The CL will be responsible for ensuring effective participation of the cluster in the cascade training activities and transmission of cluster-level INSET learning to the schools and on to classrooms.

The actual composition of cluster activities may vary from one cluster to another. Some may be oriented to GET-level maths and science instruction while others may be focused on FET-level mathematics and science subjects. Again some may place greater emphasis on mathematics than science, and vice versa. In some larger clusters, there may be established sub-groups with specific focus.

All schools should be encouraged and assisted to take part in the formation of MSSSI clusters. It is the joint responsibility of Circuit Managers and CIs in their respective areas of work to organize the informational activities leading to the cluster formation, especially to secure the understanding and support of the principals concerned. Thus, a Circuit Manager should organize a meeting at the earliest convenient time for the principal and mathematics and science HODs of all schools in his/her Circuit, explain, with the help of CIs, the present status and plans of MSSSI, in particular the expected role and working of clusters, and encourage them to form MSSSI clusters. The CIs should follow up the meeting with further guidance to the schools interested in forming a cluster so that the cluster may register and initiate concrete activities.

#### Cluster registration

MDE should open a Registry for MSSSI Clusters. Schools forming a cluster should register at the Registry by submitting a standard form, copies of which should also be sent to the relevant Regional and Circuit Offices. This form should identify the schools participating in the cluster, the name of the Cluster Leader, the contact address, telephone and fax numbers and carry the signature of all the principals concerned. The form should be accompanied by a cluster activity plan for the school year (and the internal rules of the cluster).



The CLs of the registered clusters will be invited to take part in the cascade training activities of MSSSI for material development support as well as for other training assistance.

### 1.2 Study-Cum-Training Mission to Japan for Mathematics and Science Educators

The revised cascade model will start with a 6-week study mission to Japan by 10 CLs / CIs, accompanied possibly by a University of Pretoria expert who will serve as an advisor. The selection of the CLs and CIs will be made by the MDE with due consideration to the geographical and subject balance. The number of CIs may be kept to a few, and may include those who have already experienced the Japan mission before so that they may serve as a guide for the whole team. The study mission will be sponsored by JICA and hosted by Hiroshima University/CICE and Naruto University of Education.

The purpose of the group's training is three-fold: (1) to learn about the experience of Japan in the field of education, particularly its in-service training system for teachers at the national and local levels, (2) to upgrade the knowledge and skills in the respective subject area, and (3) to develop a program of material development for implementation at the cluster level.

A rough thematic coverage scheme for the three years will be worked out by the three parties at the beginning of MSSSI Phase 2. Specific group and individual assignments for each mission need to be identified and articulated at a preparatory workshop to be organized with the assistance of the University of Pretoria. They should be communicated to the Japanese host institutions well in advance of their arrival in Japan so as to enable the latter to design the specific details of the program appropriately.

A tentative outline of the 6-week mission in Japan is shown below:

<u>Week</u>	<u>Program Focus</u>	<u>Host Institution</u>
1	General orientation/Survival Japanese/Program brief	JICA/Hiroshima Univ.
2	Japan's M & S education experience/Tokyo visit	Hiroshima Univ.
3	Elaboration of standard cluster INSET plan	Hiroshima Univ.
4	Material development	Naruto Univ. of Ed.
5	Material development / practice teaching	Naruto Univ. of Ed.
6	Completion of mission report	Naruto Univ. of Ed.

The manner of implementation of the program in Japan is to follow the pattern established during MSSSI Phase 1, including the practice of daily and weekly reflection meetings. The inclusion of at least one CI or University of Pretoria expert with the experience of Japan mission participation during Phase 1 will ensure the continuity.

### 1.3 Provincial Feedback Workshops

The results of the Japan study mission by the CL/CI team will be shared with all the MSSSI CIs at the 5-day Provincial level workshops to be organized three times at appropriate intervals (e.g., March, May and September). The purpose of these workshops is two-fold: (1) to enable the entire group of MSSSI CIs to share the results of the Japan study mission, including in particular those of the material development work, and (2) to facilitate the CIs' planning of Regional level cluster support workshops.

The first 2 and a half days of the 5-day workshop, which should start in the afternoon of Friday, should be attended by all the CIs and the CLs who have participated in the study mission in Japan. Primary focus of this part of the workshop will be sharing of the material development work done in Japan. The second half of the workshop will be for the CIs to develop the plan and prepare materials for Regional level cluster support workshops.

During the second part of the workshop, CIs will be joined by the educational administrator group that has participated in the JICA Local Educational Administration and Management Training Course in Japan is expected to join, in order to elaborate steps for strengthening the support of local educational administrators at various levels for MSSSI activities, including, in particular, the cluster-based INSET,

The technical backstopping for these meetings will be provided by the JICA and UP teams. The JICA team members will ensure that the material development work done in Japan gets translated into usable form in the cluster and school-based settings. The UP team is expected to provide additional technical support needed to bring up the newly joining CIs.

#### 1.4 Cluster Support Workshops at the Regional Level

Following each of the provincial level workshops, CIs will organize in their respective regions 2 and a half day cluster support workshops. This workshop will take place as a residential workshop during a weekend or holidays. Each cluster will send its CL and one or two other subject coordinators in accordance with the subject focus of the particular workshop. The main purpose of these workshops is to train the CLs in material development based on the work done by the Japan mission team of CLs/CIs and to guide them in the planning of cluster-based INSET activities. Through these workshops, the CLs should be trained in the use of materials that are adopted to the classroom use. They should also be provided with a study guide describing the background content knowledge needed for the particular material. The JICA and UP teams will provide technical support when and where needed.

In order to ensure that the clusters are engaged in meaningful, planned and coherent work, one of the three Cluster Support Workshops may be organized as a longer and more intensive 'Winter Conference'. The conferences will comprise a series of workshops, which will provide the training and support materials that cluster leaders will need to design an INSET programme for the following year.

The winter conference may be a showcase workshop for five types of clusters:

- Senior phase natural science
- Senior phase mathematics
- FET physical sciences
- FET life sciences
- FET mathematics

Each workshop will last for one to two days. The conference itself should last for two weeks. A workshop will focus on a single topic, and will consist of a minimum of three ingredients: (i) How to teach the topic – and especially the “new” aspects such as hands-on activities and the incorporation of societal issues; (ii) How to assess learning for that topic based on the outcomes, and (iii) Background knowledge for the teacher on that topic.

There should be enough workshops for each of the five groupings above to cover the two weeks. Preferably there would be more, thus making it necessary to offer parallel sessions. It should be possible for each cluster leader to attend between five and ten workshops during the two-week conference.

The workshops (including the materials) will initially be designed by the CIs working with faculty members from the University of Pretoria and Naruto University of Education. However, as time goes on it is expected that the cluster leaders will also design and present workshops.

### 1.5 Cluster INSET activities

Based on the material development training received at the Regional level cluster support workshops, the CLs should organize the cluster INSET activities. They will return from the workshops armed with a list of activities that will be supported during the following quarter. The Winter Conference, if implemented, will provide an even larger scope for learning activity options. Attached to the list will be the names of resource persons (e.g., from Naruto or UP) who are prepared to participate in or run a workshop in a given area at a given time. (The local CI must be prepared to give or assist with any of the workshops on offer that year.)

The clusters should try to draw up a programme for their INSET on an annual basis. They will select workshops and dates. (Since most workshops will be of 6 to 12 hours duration, they can be spread over a number of afternoon sessions.) The cluster leaders must prepare to run some of the workshops by themselves, but could call on the CIs or other resource persons for specific topics that may be more challenging. It is recognized that these "guest appearances" will give a cluster a considerable boost.

The cluster programme for the following year will be forwarded to the Teachers' Center and the circuit office for co-ordination and support purposes. For example, an outsider should not be scheduled for two clusters at the same time. The Teachers' Center should also supply each cluster with the necessary support materials for each workshop – written notes and apparatus or other teaching aids. The CLs are encouraged to seek the cooperation of CIs for organizing of these activities. The UP and JICA teams will also make some time available for attendance at the cluster INSET activities; specific request should be made by the clusters to invite members of these teams to their INSET sessions.

### 1.6 School-based INSET activities

The educators participating in the cluster activities should bring the materials back to their schools and share them with their colleagues so that they can be used in the classroom.

### 1.7 New Cascade Model: Recapitulation

The revised cascade-model for MSSSI teacher training presented above may be recapitulated by the following table:

Level	Activity	Organizer/		
		Main Provid.	Participants	Supporter
Japan	Study mission (6 weeks)	JICA team	10 CLs/ CIs	UP(prepare.WS)

Province	Feedback workshop (5 days x 3 times)	MSSI Coord. Team	Japan mission group/all CIs	UP/JICA team
Region	Cluster support workshop (2.5 days x 3 times/possibly a Winter Conference)	CIs	CLs and other cluster rep's	UP/JICA team (upon request)
Circuit	Cluster INSET (many afternoons/days)	CLs	Cluster group	CIs (upon req.) UP (by arrang.)
School	School-based INSET (once a month or more)	Cluster participant	M & S educators	CIs (by arrang)

It should be mentioned that CIs will be organizing activities at the Teachers' Centres in support of the cascade training (please see Sub-Section (3) below). The cascade training activities will also be supported by Circuit Managers, Teachers' Centres Managers and Chief Education Specialists for GET/FET and for Circuit Coordination at the Regional Offices, as discussed in the next sub-section.

## 2. Support Activities

### 2.1 Study-Cum-Training Mission to Japan for Educational Administrators

The working of the revised cascade model of MSSI teacher training will depend greatly on the willingness to uphold it of the project's target groups – that is, CIs, CLs and mathematics and science teachers. Their willingness, in turn, will be influenced significantly by the support provided by the MDE, especially by the educational administrators who interact with them at various levels of educational hierarchy. MSSI takes account of this factor, and builds into the project a supportive mechanism in terms of a training scheme for the local educational administrators to be sensitized to MSSI and a follow-up to ensure their collaboration with the target groups.

JICA organizes a 5-week study-cum-training mission for 8 local educational administrators representing different levels of educational administration in MDE. The officials to be dispatched are to come from the Head Office, Regional Office, Teachers Centres, Circuit Offices, and possibly also schools (e.g., principals). The purpose of their mission is generally to learn from the educational administration and management experience of Japan, but includes a specific assignment to examine the situation of MSSI support by the administrative structure and make suggestions for improvement. In the immediate future, particular emphasis should be placed on how Regional Office, Teachers' Centres and Circuit Offices can support cluster-based INSET activities. The last week of their mission will coincide with the first week of the study mission by CLs / CIs so that they may coordinate their studies in Japan.

The local educational administrators who take part in the Japan mission will give their feedback to the CIs at the Provincial feedback workshop of CLs / CIs. This will also provide a useful opportunity to elaborate the Province-wide approaches to support MSSI. They are also expected to share their experience and ideas with various MSSI

stakeholders through Regional support workshops and other opportunities, such as Regional Office meetings and Circuit Managers meetings.

## 2.2 Material development and dissemination

Through the implementation of whole MSSSI activities, including MSSSI Phase 1, plenty of materials, modules and textbooks (hereinafter referred to as "Materials") have been developed. In Phase 2, efforts will be made to strengthen these activities, aiming at production of distributable materials. They will be of three kinds, as follows: (i) training manuals, (ii) study guides and (iii) VTR series.

Logistical framework for the dissemination of these Materials to the workshops, school-based INSET and the personal use of the teachers, shall be established by the CIs. All the participants of MSSSI could access to the Materials freely in principle. CIs shall list the materials and inform the list to CLs. CLs, HODs, so that the teachers could apply the copy of the Materials.

### Training manuals

During Phase 1, three training manuals were produced through the initiatives of CIs – namely, *Planning and Running Workshops*, *Peer Teacher Learning* and *Clustering of schools A Guidebook*. They were compiled into booklets and published under the joint sponsorship of MDE, University of Pretoria and JICA. CIs and CLs will be encouraged to continue producing such manuals for publication based on their training experiences.

### Study Guides

In Phase 2, greater emphasis will be placed on the production of subject content materials for systematic use in training activities, especially at the cluster and school levels. For the purpose of quality control and dissemination to all the participants, Materials shall be consolidated into study guides, which will inform the cascade chain from CI training to classroom use. UP shall support CIs of their administration in line with the content enrichment.

The study guides will need to be developed for the following learning areas:

- Senior phase natural science
- Senior phase mathematics
- FET physical sciences
- FET life sciences
- FET mathematics

By the end of Phase 2 there should be about 10 study guides in each area. Each study guide will be developed around a single topic and could consist of a minimum of three ingredients:

- How to teach the topic – and especially the "new" aspects such as hands-on activities and the incorporation of societal issues.
- How to assess learning for that topic based on the outcomes.
- Background knowledge for the teacher on that topic.

Possible beginning points for the development of study guides are the resource materials already produced by participants while in Japan and the UPIFY study materials.





## Video materials

It is suggested that the installation of video kit as one of the Materials to assist the classroom lessons of the teachers. The contents of the video kits are considered as follows: e.g. (a) Model classroom lessons, (b) Guidance of the teaching method and (c) Video monitoring and analysis of actual classroom lessons, etc. Video kits could be developed by CIs by the support of the Japanese experts and UP.

### **2.3 Utilizing Teachers' Centres**

It is imperative that the recognition that Teachers' Centres are 'resource centres' is grasped by everyone within the MDE. Teachers' Centres should be utilized to empower whoever needs it for promoting activities with a classroom focus. Since MSSSI seeks to improve classroom practices, it is important that the Mathematics and Science CIs make it more user-friendly than elsewhere. Since some clusters will be far away from the Teachers' Centres, it should however be feasible for cluster leaders to access required resources at a particular time through the CIs. The Centre managers are required to, therefore, have a good understanding of the functions of the MSSSI. The Mathematics and Science CIs should also have good working relationship with the Centre Manager

Placement of Japanese mathematics and science teacher volunteers (JOCV) in the Teachers' Centres has started during Phase 1, and is expected to all the center during Phase 2. They should work with the CIs, CLs and mathematics and science teachers in the locality to development the Teachers' Centre activities. One obvious possibility for their engagement will be to utilize the mathematics and science equipment being installed in Teachers' Centres by the Embassy of Japan through its Grass-roots Grant Aid Program and organize sessions for demonstrating their uses. They could be made regular programs designed for any mathematics and science teachers (e.g., every first and third Monday of the month). The JOCV volunteers may also organize 'Mathematics Club' or 'Science Club' for learners around uses of equipment or experiments. They may stimulate such activities by linking up with the corresponding clubs in Japan through internet.

### **2.4 Special Support for Distant Rural Schools**

The cluster focus of the new cascade training in MSSSI may pose some handicap to schools that are located in distant rural areas – away from other schools. Because the size of these schools is usually small, the number of mathematics and science teachers is also very limited, which makes it difficult to join the cluster activity and also conduct school-based INSET. In order to ensure that these schools can participate in MSSSI and draw the project's benefits as for other schools, a special support scheme may be developed for them out of the Teachers' Centres.

While it is the job of the CIs to visit these schools, because of the long distance involved and the special preparation required for providing support to these schools, there is a tendency for these schools to receive a lower priority for CIs' visits. It is suggested that the JOCV volunteers help the CIs in developing the support activities for such schools and organize the visits, jointly with CIs. CIs may find it easy to make such visits if they are accompanied by a Japanese volunteer(s), as it becomes easier to explain the nature of MSSSI as a project. Schools with such difficulties are easily identified, so certain dates of the month may be designated by each Teachers' Centres for such visits. It is important that such special support scheme is implemented in all the former districts,

and the participation of JOCV volunteers located in the Teachers' Centres may ensure that this take place in that manner.

## 2.5 MSSSI Annual Sharing Meetings at the Regional Level

No matter how conscientiously the CIs and Circuit Managers do the guiding of schools to initiate cluster activities, there will always be some that fail to participate for various reasons. In order to ensure that all schools are exposed to the MSSSI experience, the CIs should organize in each region once a year a 2-day sharing session. At such meetings, not only the status of the MSSSI projects needs to be presented, but also the actual experience of some leading schools in cluster and school-based INSET should be communicated. Such a meeting will also provide a useful platform for exchanging positive experience and an opportunity for trading possible solutions to commonly faced problems.

## 2.6 Support for Cluster Development by the University of Pretoria

As mentioned in this documents, the cluster make an important role of the Project in Phase 2. In order for the cluster to function effectively, the University of Pretoria will provide its knowledge and experience in developing and facilitating their activities. The university is expected to be a one-stop resource center for the CL's and the cluster.

## 3. Monitoring, Research and Evaluation

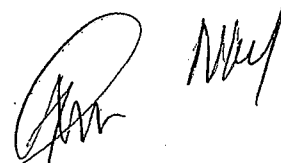
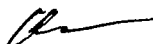
Monitoring, research and evaluation to be conducted jointly by the three collaborative partners will not only constitute the primary means for assessing the progress of work and informing the program decisions but also serve as a primary instrument for promoting capacity development and provide all stakeholders with good lessons for sustainable activity in the future.

### 3.1 Monitoring System

The Monitoring system established in Phase 1, using the so-called 'Matachi Format' (i.e., Form 1~Form 4), helped the MSSSI Coordinator Team to keep track of school-based INSET activities, especially the frequency of such activities at each school. However, the information-sharing function of the system did not function fully as the practice of reporting by school principals of such activities using the system at the District-level workshops did not take roots. The initial assumption that the monitoring system may serve to transmit the information about 'model' school-based INSET activities across different participating schools did not materialize. Under such circumstances, many CIs lost impetus for their monitoring task.

Based on the reflection of this experience, the monitoring system in Phase 2 will be organized differently, assigning the principal responsibility for generating the monitoring information to the clusters. School-based INSET and cluster INSET activities will be monitored by 'Cluster Monitor Reporters' (to be designated by each cluster from among the participating HODs or teachers), who will provide quarterly reports on the cluster's and cluster schools' INSET to 'Regional Monitor Reporter' (to be designated by each region from among the M & S CIs), who, in turn, will provide quarterly reports on the Region's INSET to the MSSSI Coordinator Team, who will report on the Province's progress of work on INSET to the Steering Committee.

The table below shows the difference in the working of the monitoring system



between Phase 1 and Phase 2.

	<u>Phase 1</u>	<u>Phase 2</u>
School level INSET	HODs report school-based INSET to CIs (Forms 1 & 2)	HODs report school-based to CMR (if a particular school is not in a cluster, to RMR)
Circuit level		CMR compiles cluster members' School-based INSET and cluster INSET and send a quarterly report to RMR
District level	CIs compile District-level quarterly report and send it to MSSSI coordina- tors	
Regional level		RMR compiles Regional level quarterly report on MSSSI implementing clusters and schools
Province level compiles	MSSSI Coordinator Team compiles Province level Report for submission to Steering Committee bi-annually	MSSSI Coordinator Team Province level Report for submis- sion to Steering Committee bi-annually

### 3.2 Research activities

Based on the research experience during Phase 1, there has emerged a clearly identified need for research to ensure effective and efficient implementation of MSSSI. The following is an outline of the plan of research for Phase 2.

#### Aims and Research Questions

(1) *Evaluate and seek to understand the effectiveness of the cascading model of professional development through all its levels from the University/CI interaction to the classroom.*

- (i) How does the intended curriculum, as manifested by a professional development module, get realized as the actual curriculum in the classroom? In other words, how strong is the fidelity of the intentions from the beginning of the cascading chain to the end.
- (ii) What are the characteristics of a successful cascading model?
- (iii) What is the quality of teaching, learning and assessment in the mathematics and science classrooms of the cluster schools?

(2) *Evaluate and understand the characteristics and modes of operation and formation of successful and less successful clusters.*

- (i) What distinguishes success clusters from less successful ones in terms of formation, operation and other characteristics?
- (ii) How, and to what extent, is instructional leadership developed within clusters?
- (iii) What role is played by the Teachers' Centres in the support and success of clusters?
- (iv) How many clusters are operational in the province as a whole, what topics are studied in these clusters, and how frequently do they meet?

(3) *Evaluate the performance of grade 8 to 12 learners on the new C2005 assessment standards.*

- (i) Is there evidence of improved performance of grade 8-12 learners on assessment instruments that reflect the new C2005 outcomes during phase 2 of the MSSSI project?
- (ii) Are there relationships between the grade 9 CTA, teacher continuous assessment and the MSSSI instrument?

The first research activity will document and seek to interpret and understand the cascading model of professional development. The model begins with the interaction between Curriculum Implementers and faculty members of Naruto and Pretoria Universities, during which time materials and professional development courses are conceptualized. Each Curriculum Implementer then works with about 40 HODs and/or cluster leaders. Each cluster leader, in turn works with teachers in that cluster. Finally, the teachers in the cluster take the ideas into the classroom. The research activity will follow the process by selecting a vertical slice by participating at the following levels:

1. The planning meeting involving Curriculum Implementers and university personnel
2. Select at most four Curriculum Implementers to study the HOD/cluster leader workshops.
3. Select at most four clusters to study the school/cluster-based workshops.
4. Select at most four schools to study the implementation of the workshop materials and ideas at the school level. If at all possible, these four schools will be chosen from those in which case studies were conducted in 2002. In other words, the selection of clusters and Curriculum Implementers will be guided by the selection of schools in which case studies have already been conducted.

The methodology for the study of these "slices" will be largely observation and interview. Each slice will constitute a case study of the cascading model. In seeking to answer question (3) above, additional (to the case studies) data will be sought from a wider sample of schools. A sample of about 10% of Mpumalanga secondary schools will be involved in a survey which will seek to determine classroom practices with regards to teaching, learning and assessment practices. The survey would include all mathematics and science teachers (grades 8 to 12) in about 50 schools.

The second research activity will seek to understand the process by which clusters are formed and operate, and what factors lead to their success or failure. In the case of successful clusters, the extent to which professional growth and the emergence of instructional leadership is realized for members of the cluster will be studied.

The efforts of at most four CIs to establish functioning clusters in their areas will be studied by means of observation of initial meetings, interviews with the Teachers' Centre directors, CIs and CLs, and document analysis. The efforts of each particular CIs to set up all the clusters in his/her area will be monitored.

At most four functioning clusters will be selected for a long term (the duration of phase 2) as case studies of successful entities for the promotion of professional development and instructional leadership.

In addition, data will be collected on the activities of all clusters using the existing (or modified) forms already developed.

The third research activity will monitor the learner progress for the duration of phase 2. Tests will be devised for the senior phase and the FET phase based on the new assessment standards. In the case of the senior phase, the test will also be consistent with the current specific outcomes. Each test will comprise both a mathematics and a science section. These tests will be administered to a sample of Mpumalanga schools, and to a random sample of learners at each school. The sample of schools will be the same as for activity one to save on administration costs.

Items for the two tests (senior and FET phase) will be selected, devised and tried out in a small sample of pilot schools. The best questions will be kept for the final version of the test. The two tests will have a small number of common questions to allow for comparing progress over the five-year span of grade 8 to 12. The tests will be administered to the sample schools at the end of 2003, 2004, 2005, and (maybe) 2006.

Possible relationships between these tests, the grade 9 CTA results and the teachers' continuous assessment marks will be explored. If the new grade 12 examination is in place by 2006, additional comparisons are possible. Comparisons between participation in clusters activities, the capacity of the school, and the test results will also be explored.

### **3.3 Evaluation of the Project Outcome**

It is customary for JICA to conduct an evaluation study near or at the conclusion of every project it assists. Thus, it is expected that in the fall of 2005 or at the beginning of 2006, another round of such exercise is organized. There will obviously be an emphasis in such evaluation on project outcome of MSSSI. As the employment of an external evaluator for evaluation of Phase 1 turned out to be a positive experience not only for JICA but for all concerned. The planning of such an outcome evaluation should be conceived in line with the implementation research.

## **4. Related Capacity Building Activities**

### **4.1 Accredited Professional Development Program for Mathematics and Science Educators**

The MDE is fully aware of the need of many educators to improve the understanding

of the subjects/learning areas that they have to teach. In the Phase 2 framework of MSSSI, there is an additional need to provide FET educators with the skill to teach different. In order to provide incentives to the province's mathematics and science teachers to upgrade their skills, MSSSI provides a learnership programme organized and administered by the University of Pretoria, and funded from the SETA funds of MDE.

The principle of the learnership programme is to allow teachers to begin at the level at which they can cope and be successful, and to lead them to the next level. It is a four-year, multiple entry/exit programme culminating in an ACE with University of Pretoria accreditation.

#### 4.2 Graduate Training in Japan

JICA has a scholarship programme for graduate study in Japan, which will accept a few mathematics or science teachers every year from MSSSI project participants for a Masters level study in Japan. The final selection of educators will be made by JICA on the basis of nominations made by the MDE. The selected teacher is to spend two and a half years for graduate work in mathematics education or science education at a Japanese national university, including the first half a year for studying the Japanese language.

### V. Project Implementation Structure and Financial Arrangements

#### 1. Commitment by Mpumalanga Department of Education

##### (1) Provincial level

Mpumalanga Department of Education, as the initiator and owner of MSSSI, has the primary responsibility for basic decisions regarding the implementation of MSSSI. To fulfill this responsibility, the Department needs to take the following actions at the level of the central office:

- (i) Establishment of a Steering Committee within the structure of the Department to take all joint decisions for planning, implementing and evaluating the implementation of MSSSI, with the understanding that, if and when necessary, Working Committees could be organized for certain specific purposes (such as for promotion of cluster INSET and material development);
- (ii) Designation of responsible officials to deal with MSSSI, who shall act as the Department Coordinators for this project;
- (iii) Convening of the regular Steering Committee meetings on a semi-annual basis, and of additional meetings when judged necessary and appropriate by the MSSSI Coordinator Team;
- (iv) Provision of regular budgetary resources, as necessary and appropriate, to cover part of the local costs for implementing MSSSI;
- (v) Provision of adequate resources for establishing and sustaining a UP-backed professional development scheme for mathematics and science educators, and



- (vi) Provision of an office for the JICA Coordinator at CMD with adequate secretarial support;

## **(2) Regional level**

The center of gravity of the MSSSI project is to move closer to schools and classrooms in Phase 2. Given the context of organizational change in MDE, this means that the newly created three Regional Offices should play a prominent role in the project process. Specifically, they are expected to do the following activities:

- (i) Participation of the Regional officials in the Steering Committee;
- (ii) Encouragement of, and support for, cluster INSET activities;
- (iii) Development of MSSSI-related activities at the Teachers' Centres, including the utilization of mathematics and science equipment installed by the Japanese Government through its Grass-roots Grant Aid Program;
- (iv) Cooperation in the organization of Circuit Support Workshops and Annual MSSSI Sharing Workshop to be held at the Regional level;
- (v) Provision of special support for distant rural schools which have difficulties in participating in MSSSI activities; and
- (vi) Nomination of candidates for participating in the Study-cum-Training Missions to Japan for MSSSI Cluster Leaders and for Educational Administrators.

## **(3) Circuit level**

- (i) Provision of guidance to the principals of schools regarding participation in MSSSI, especially for formation and running of cluster INSET;
- (ii) Provision of support to the Cluster Leaders in the planning and implementation of cluster INSET activities;
- (iii) Cooperation with CIs in the conduct of MSSSI activities; and
- (iv) Encouragement for schools to integrate MSSSI activities into their regular programmes, including enhancement of the positive impacts of Peer teacher learning (PTL) and other MSSSI practices on the whole school development.

## **(4) School level**

- (i) Endorsement and support for MSSSI activities, especially school-based INSET;
- (ii) Provision of support for participation by the school's teachers in cluster INSET activities;
- (iii) Cooperation with Cluster Leaders, CIs and Circuit Officials for promoting cluster INSET activities, including hosting of such activities; and



- (iv) Integration of MSSSI activities to the school's regular program, including enhancement of the positive impact of PTL and other MSSSI practices on the whole school development.

## **2. Commitment by the University of Pretoria**

The University of Pretoria as a partner has an important role to play. There was a feeling that the role that the University of Pretoria played in Phase 1 was not very visible in terms of content knowledge and that Mathematics was neglected in Phase 1. The university focused on what the teachers were doing in schools through case studies and little was done to equip them with skills to manipulate the science equipment through practical work in sciences. In phase 2 the CIs request intensive training on practical work in sciences. The learning area of mathematics should be taken seriously by the University and assign the mathematics task on professional development to the mathematics educator.

### **The Steering Committee**

The University of Pretoria should be a member of the Steering Committee in order to be part of a decision making team with the other stakeholders. The University of Pretoria should be represented at the Coordinator Team. This will help the university to understand the whole process of implementation better and to give advice where necessary.

### **Training and Development of Manpower**

The University of Pretoria should be involved in the training of the CIs, and the CLs working hand in hand with Naruto University of Education. It is thus very crucial to have a University of Pretoria representative when the CLs or CIs go to Japan for training. This will help to translate the training in Japan to the South African context.

### **Cluster Support**

Cluster support is quite important in the Phase 2. Although the CIs should fully support the clusters, the University of Pretoria could do some follow up at random with the aim of assessing and monitoring the activities in clusters.

### **School Support**

The impact of MSSSI should be seen in the classroom at schools. It will be important for the University of Pretoria to work with some schools in the regions, in order to see how much of the resources materials that UP has developed is used in schools and how it is used.

### **Material Development**

The University of Pretoria should develop the materials that will be used by all the clusters so that it can enable the University to form basis of assessing the impact of MSSSI on the Learners Performance. Teachers Guides and Modules should be developed to help the teachers to understand the content knowledge and the new demands of the new





curriculum, e.g. assessment.

### Video Production

Teachers as adult learners learn better if they observe and see the reality of the activities in the classroom situation. The good lessons from schools and clusters can be captured for training and sharing purposes at cluster meetings and at school-based INSET. CIs with the help of the University of Pretoria could play an important role in this regard.

### Research and Monitoring

Research and monitoring instruments should be built into the programme and this should be communicated to all stakeholders.

### Orientation Programme for the Volunteers

The University to run an orientation workshop for the new JOCV in order to understand their role in MSSSI and the nature of support that they can offer to Farm schools, Teachers' Centres and Clusters. This can be done in collaboration with the CIs and the Centre Managers.

### Provision of Academic Support

Academic support that will assist in addressing the needs of the teachers e.g. mathematics educator and the mathematics materials should be provided.

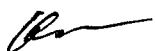
### Studying Opportunities

The University of Pretoria is expected to provide additional technical support needed to bring up newly joining CIs. The university will propose a week-long workshop for the newly appointed CIs to be funded by the Mpumalanga department of Education (e.g. through skills development funds)

## **3. Commitment by the Japanese Government**

The Government of Japan shall provide the following components for MSSSI through JICA:

- (a) Technical Training in Japan for teachers' trainers, especially for the CLs and the CIs;
- (b) Japanese Experts (short term groups approximately up to one month on each time) for follow-up guidance and advisory support for the teachers' trainers, especially for the regional and cluster workshops designed for HODs;
- (c) Equipment and facilities for workshops, as well as to the Teachers' Centres and the schools that are participating MSSSI activities;
- (d) JICA Project Coordinator for MSSSI seconded to Mpumalanga Department of Education;



- (e) Japan Overseas Cooperation Volunteers (JOCV) seconded as a supportive partners of teachers' trainers (especially CIs) to carry a practical support of classroom lessons;
- (f) Organizational and financial support of University of Pretoria for their technical assistance and research activities by contract basis (if the other local organization (e.g. NGOs) may arises, the support to them shall be discussed and considered);
- (g) Organizational support and technical advice for material development by CIs and UP; and
- (h) Organizational support on Postgraduate course as a technical trainee (up to 2 years) to Japan, for the participating teachers' trainers.

#### 4. Decision-making and Coordination Mechanisms

MSSI is a project of the Mpumalanga Provincial Government, and specifically its Department of Education. However, the responsibility for decision-making is jointly shared by the three collaborating partners – namely, Mpumalanga Department of Education, the University of Pretoria and JICA – through the mechanism of MSSI Steering Committee. Given the organizational change in MDE, and also taking into consideration the change in the grade coverage, the new cluster focus and classroom impact concern of MSSI in Phase 2, the MSSI Steering Committee should be reconstituted. Specifically, the new FET concern should be reflected in the Committee's composition, along with the continued concern with GET. The three Regional Offices will need to be represented on the Committee, for example, by the Chief Education Specialist in charge of GET/FET. Presence of some Circuit Managers and School Principals will also be necessary. The University of Pretoria and JICA should continue to be represented by the responsible official of the Center for Mathematics, Science and Technology and JICA South Africa Office, respectively.

Given the basic decision-making structure for the project and the commitments by the respective partners, there is a need for a well-functioning coordination mechanism. As mentioned earlier, this is to be done by an MSSI Coordinator Team. The University of Pretoria is represented by two staff members of its Center for Mathematics, Science and Technology Education, working as alternates. JICA is represented by the JICA Project Coordinator stationed in Mpumalanga Province. The MDE is to be represented by four officials representing GET and FET sections of the Curriculum Department. In order to ensure the sustainability of the project beyond Phase 2, it is essential that much of the Coordinator Team's work becomes internalized in the course of Phase 2 development. What is needed is that the following tasks of the Coordinator Team will increasingly performed as part of the departmental routine:

1. To serve as the secretariat for joint meetings of the three collaborating partners;
2. To help a shape of the common views among the three collaborating partners regarding all aspects of MSSI;
3. To formulate plans and programs for MSSI;




4. To act as the chief implementer of MSSSI at the Provincial level;
5. To prepare bi-annual monitoring evaluation reports on MSSSI;
6. To act as the focal point for MSSSI-related communication with the District-level education authorities, teacher trainers, mathematics and science HODs, schools, etc.;
7. To promote information dissemination regarding MSSSI within and outside the Province; and
8. To deal with any other issues and questions raised by the three collaborating partners.

## VI. Risk Analysis

(1) A major policy shift in any of the three collaborative partners towards the project would disturb the project significantly. Major delays in project implementation or changes in key personnel composition could affect other partners' plans and might, thus, affect the partnership among the three organizations. The members of MSSSI Coordinating Team would have to plan well jointly and work closely with their respective authorities so as to produce practical solutions. There should be no compromise in the allocation of time and effort for MSSSI by members of the Coordinating Team.

(2) Inadequate resource materials to be used in workshops could hinder the speed and degree of improving educators' knowledge and skills in teaching. This could leave educators at the schools to continue conducting less effective lessons on daily basis. Easy access to the (past) resources is also problematic. The three partners should make sure that resource materials for workshops and mission to Japan are of sufficiently high quality to help educators in the classroom and that educators can easily access such resources.

(3) Insufficient availability of resources for workshops such as venue, resource personnel, materials, and/or budget for transport could discourage educators to conduct cluster activities. Teachers' Centres could play a significant role here to support educators with various resources.

(4) Practicability of school-based approach could be questioned in case of schools in remote and rural areas. Some rural farm schools may not have enough mathematics and science educators to make the approach possible. In such cases, it is expected that CIs together with JOCV will visit those schools and support the educators.

## VII. Tentative Project Schedule

What is shown below is an approximate projection of major MSSSI activities. Regular activities to be carried out at the Teachers' Centres, Circuit-level (e.g., cluster INSET), school-level (e.g., school-based INSET), material development activities, monitoring and research activities, etc. are omitted. For each of these activities, a detailed plan needs to be elaborated for each of the parties entrusted with their



implementation.

2003

Feb-Mar Preparatory work

1. Finalization of the Phase 2 Agreement Document
2. Elaboration of Guidelines for Forming and Running Clusters
3. Development a 3-year framework for subject content coverage (i.e., plan for preparing study guides)
4. Holding of Circuit-level meetings for Phase 2 explanation to schools, including, in particular, suggestion of cluster formation
5. Opening of MDE's Cluster Registry
6. Elaboration of a detailed plan for Year 1
7. First meeting of the Reconstituted Steering Committee
8. Provincial Feedback Workshop
9. Publication of a Training Manual on Strategy for Clusters

Apr Signing of the Phase 2 Agreement Document  
Initiation of Phase 2  
Cluster Support Workshop

May-Jun Provincial Feedback Workshop

Jun-Jul Cluster Support workshop  
Steering Committee Meeting

Sep Provincial Feedback Workshop  
Cluster Support Workshop

Oct Study-Cum-Training Mission for Educational Administrators

Nov-Dec Study-Cum-Training Mission for CLs/CIs

Dec Steering Committee Meeting

2004

Feb Provincial Feedback Workshop

Mar Cluster Support Workshop

May-Jun Provincial Feedback Workshop

Jun-Jul Cluster Support workshop (Winter School?)  
Steering Committee Meeting

Sep Provincial Feedback Workshop  
Cluster Support Workshop

Oct Study-Cum-Training Mission for Educational Administrators

Nov-Dec Study-Cum-Training Mission for CLs/CIs



Dec Steering Committee Meeting

2005

Feb Provincial Feedback Workshop

Mar Cluster Support Workshop

May-Jun Provincial Feedback Workshop

Jun-Jul Cluster Support workshop (Winter School?)  
Steering Committee Meeting

Sep Provincial Feedback Workshop  
Cluster Support Workshop

Oct Study-Cum-Training Mission for Educational Administrators

Nov-Dec Study-Cum-Training Mission for CLs/CIs

Dec Steering Committee Meeting  
MSSI Outcome Evaluation

2006

Feb Provincial Feedback Workshop

Mar Cluster Support Workshop  
Final Steering Committee Meeting



## ANNEX 1

## Project Design Matrix (PDM)

**Project Title:** Mpumalanga Secondary Science Initiative (MSSI) Phase II  
**Executing Bodies:** Mpumalanga Department of Education (MDE), Joint Centre for Science, Mathematics and Technology Education, University of Pretoria (UP) and Japan International Cooperation Agency (JICA)  
**Duration :** 3 years from 1<sup>st</sup> April, 2003 to 31<sup>st</sup> March, 2006  
**Preparation:** MSSI Phase I (1999 - 2003)  
**Revision:** February 2003(Ex Ante Evaluation)

NARRATIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>(Long-term Goal) Grade 8 -12 learners in the Province acquire enhanced skills in mathematics and science.</p> <p>(Overall Goal) The quality of teaching in mathematics and science in the Province is improved by enhancement of teaching skills and subject content knowledge of the teachers.</p>	<p>Students' achievements in surveys (e.g. TIMSS (Third International Mathematics and Science Survey), etc.)</p> <p>Reports of the monitoring and evaluation activities conducted by Mpumalanga Department of Education, MDE)</p>	<p>TIMSS or any alternatives</p> <p>The monitoring and evaluation format by MDE.</p>	<p>Students are favorably disposed to mathematics and science</p>
<p>(Project Purpose) A School-Based In-Service Training (INSET) for Grade 8 – 12 mathematics and science teachers in Mpumalanga Province is established and maintained within the framework of cascade training system.</p>	<p>1. Frequency of school based in-service training (INSET) as well as the cluster workshops</p> <p>2. Quality of school based INSET as well as the cluster workshops</p>	<p>1,2 MSSI Project Monitoring and Evaluation reports.</p>	
<p>(Outputs)</p> <p>1. Classroom practice of mathematics and science teachers for Grade 8 – 12 in Mpumalanga Province will be improved by the establishment of School-Based INSET activities within the framework of cascade training system.</p> <p>2. Supportive environment for a School-Based INSET system will be ensured in Mpumalanga Province.</p> <p>3. Monitoring and Research activities will be practiced by Mpumalanga Department of Education so that sustainability of the School-Based INSET is secured.</p> <p>4. Secondary (Grade 8 – 12) mathematics and science teachers will be capacitated with academic education by the accreditation programme.</p>	<p>1. The report of the classroom lessons shall be reflected through MSSI Monitoring and Evaluation system, then knowledge and experience shall be shared by the teachers through the cluster workshops</p> <p>2. Number of the schools as well as the teachers who participated in the school based INSET, under the school policy for INSET.</p> <p>3 Number of the monitoring and evaluation reports by the MDE, and comments from the MSSI Coordinator team shall be reflected to Provincial and Regional workshops.</p> <p>4. Number of the teachers who participated and acquired the accreditation by the programme prepared by UP</p>	<p>1 MSSI Project Monitoring and Evaluation reports and the Reports by the Japanese Experts and University of Pretoria (UP)</p> <p>2. MSSI Project Monitoring and Evaluation reports</p> <p>3. MSSI Project Monitoring and Evaluation reports</p> <p>4. Monitoring and Evaluation Reports by UP</p>	<p>Assistance of MSSI Coordinating Team and the UP is maintained</p>

<p>(Activities)</p> <p>1-1 To promote formulation of Clusters of mathematics and science teachers in neighboring schools.</p> <p>1-2 To provide training opportunities in Japan for Curriculum Implementers (CIs) and Cluster Leaders (CLs) to acquire subject content knowledge and teaching skills of mathematics and science, as well as management skills of the INSET.</p> <p>1-3 To organize the Provincial level feedback workshops for the purpose of disseminating subject content knowledge, teaching skills and management skills of the INSET, among CIs and CLs.</p> <p>1-4 To organize the Regional level Cluster support workshops for the purpose of capacitating CLs to facilitate the Cluster INSET.</p> <p>1-5 To organize the Cluster INSET activities for the purpose of sharing experience and practice among mathematics and science teachers.</p> <p>1-6 To promote regular School-Based INSET activities for the purpose of improving classroom practice of mathematics and science teachers for Grade 8 – 12.</p> <p>2-1 To provide training opportunities in Japan for educational administrators from the Mpumalanga Department of Education (MDE) to understand and support the INSET activities.</p> <p>2-2 To develop educational materials, modules and textbooks to support the teachers to improve classroom practice..</p> <p>2-3 To utilize facilities and equipment of the Teachers Centres (TCs) in order to improve the classroom practice.</p> <p>2-4 To carry out CIs' outreaching activities to schools in remote areas to support the teachers.</p> <p>2-5 To organize the Regional MSSSI sharing meetings for the purpose of disseminating progress and achievement of the Project to all the schools in Mpumalanga Province.</p> <p>3-1 To establish and operate monitoring system for progress and quality of INSET activities.</p> <p>3-2 To conduct research activities for the purpose of sharing good practices of the Project.</p>	<p>(Inputs)</p> <p>1. South African side:</p> <p>1-1 By Mpumalanga Department of Education</p> <p>(1) Building and Facilities</p> <p>(2) Offices for Japanese Experts and secretary supports</p> <p>(3) Designation of necessary counterparts (MSSI Steering Committee, MSSI Coordinating Team)</p> <p>(4) Support for Cluster Activities</p> <p>(5) Running cost, as necessary and appropriate, from regular resources for the implementation of C2005</p> <p>1-2 By University of Pretoria, Joint Centre for Science, Mathematics and Technology Education</p> <p>(1) Designation of MSSSI Coordinators</p> <p>(2) Personnel Cost</p> <p>(3) Technical Assistance to CIs, CLs and the teachers</p> <p>(4) Research and Monitoring Services</p> <p>(5) Material Development Support</p> <p>(6) Customized "Multi-entry / Multi-exit" program</p> <p>2. Japanese side: By and Through JICA</p> <p>(1) Dispatching of long-term Project Coordinator to MDE</p> <p>(2) Dispatching of short-term experts</p> <p>(3) Country-focused training course (Study-cum training mission) in Japan</p> <p>(4) Long-term training course for Graduate training</p> <p>(5) Support for the implementation of workshop activities</p> <p>(6) Equipment for workshops</p> <p>(7) Support for the implementation of research, monitoring, evaluation and technical assistance activities of UP</p>	<p>Strong partnership among MDE, UP and JICA shall be maintained and strengthened</p> <p>MDE and UP shall facilitate themselves with their own budget, personnel and system</p>
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<p>4-1 To capacitate mathematics and science teachers in Mpumalanga Province with academic education by the accreditation programme prepared by University of Pretoria.</p> <p>4-2 To capacitate mathematics and science teachers in Mpumalanga Province with the academic education by the graduate training in Japan (JICA long-term training course).</p>		
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