

## Summary

<b>I. Outline of the Project</b>	
<b>Country : United Mexican States</b>	<b>Project title : Strengthening of Air Monitoring Program in the United Mexican States</b>
<b>Issue/Sector : Environmental Management</b>	<b>Cooperation scheme : Technical Cooperation Project</b>
<b>Division in charge :</b> Global Environmental Dept. Environmental Management Group Environmental Management Division II	<b>Total cost : 410 million yen</b>
<b>Period of Cooperation</b>	<b>(R/D): 2005/8/12</b>
	<b>2005/10/12-2008/10/11</b>
	<b>Partner Country's Implementing Organization : CENICA</b>
	<b>Supporting Organization in Japan : Ehime University</b>
<b>Related Cooperation :</b>	
<b>1. Background of the Project</b>	
<p>Currently in Mexico, although the air pollution in ZMVM is on an improving course, the ratio of days on which air quality standards are exceeded is still more than 80%. And the situations of air pollution in large cities other than ZMVM are also matters of concern. To control air pollution, it is very important to figure out the current situation and to implement effective measures based on air quality monitoring. However, it has been difficult for United Mexican States to figure out the current air quality correctly and to implement the necessary measures against air pollution because the data reliability of air pollution monitoring has been low, and the method of analyzing and managing monitoring data has not been implemented accurately. In addition, it is necessary for local government in United Mexican States to build accurate QA/QC and data management system to implement "National Air Quality Monitoring Program (2003-2008)" for standardizing air quality monitoring.</p> <p>Under this background, United Mexican States requested the project "Strengthening of Air Monitoring Program in the United Mexican States" to enhance the capacity for air quality monitoring.</p>	
<b>2. Project Overview</b>	
<b>(1) Overall Goal</b>	
Capacity of the Mexican society to manage air quality is strengthened.	
<b>(2) Project Purpose</b>	
The Mexican society recognizes importance of air quality monitoring and capacity of the local governments to provide and utilize reliable air quality information for policy planning and evaluation is strengthened.	
<b>(3) Outputs</b>	
<ol style="list-style-type: none"> <li>1. Capacity to collect reliable air quality monitoring data in Mexico is strengthened.</li> <li>2. The existing air quality monitoring equipment calibration system in Mexico is improved.</li> <li>3. Studies that complement existing air quality monitoring are carried out.</li> <li>4. Capacity to conduct management and analysis of air quality monitoring data in Mexico is strengthened.</li> </ol>	

5. Accessibility of the general public and policy makers towards information about air quality is increased.

6. The National Air Quality Monitoring Program 2007-2010 is prepared.

**(4) Inputs**

**Japanese side :**

<b>Long-term Expert:</b> 0	<b>Equipment</b>	68 million Yen
<b>Short-term Expert:</b> 10	<b>Local cost</b>	30 million Yen
<b>Trainees received:</b> 6		

**Mexican Side :**

<b>Counterpart:</b> 16		
<b>Land and Facilities</b>	<b>Local Cost</b>	MX\$9,780,000

**II. Evaluation Team**

<b>Members of Evaluation Team</b>	1 Leader: KUMAGAI Hidenori Team Director, Environmental Management Team II, Global Environment Dept. JICA 2 Air Pollution Management: CHIHARA Hiromi Senior Advisor, JICA 3 Air Pollution Monitoring: WAKAMATSU Shinji Professor, Ehime University 4 Cooperation Planning: KITAJIMA Tomomi Staff, Environmental Management Team II, Global Environment Dept, JICA 5 Project Evaluation: HIROUCHI Yasuyo Permanent Expert, International Development Associates Ltd.		
<b>Period of Evaluation</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">27/01/2008-17/02/2008</td> <td style="width: 50%;"><b>Type of Evaluation :</b> Terminal Evaluation</td> </tr> </table>	27/01/2008-17/02/2008	<b>Type of Evaluation :</b> Terminal Evaluation
27/01/2008-17/02/2008	<b>Type of Evaluation :</b> Terminal Evaluation		

### **III. Results of Evaluation**

#### **1 Summary of Evaluation Results**

##### **(1) Relevance**

The Overall Goal is relevant with the needs of Mexico because air pollution is a serious problem and the need for air quality management is high. The Project Purpose is consistent with the organizational needs of CENICA. It is relevant with the needs of local governments, which are required to establish and operate air monitoring systems by the article 112 of the General Law of Ecological Equilibrium and Environmental Protection. The Overall Goal and the Project Purpose are consistent with the Federal Program for the Environmental and Natural Resources Sector for 2007-2012 of Mexico as well as [JICA assistance strategy for Mexico](#). Japanese technical advantage in the field of air quality monitoring is confirmed by the Mexican C/P. The Project is considered to be relevant.

[Indicator 1: Based on CENICA's report, it is recognized that 18 local monitoring networks has provided reliable air quality monitoring data through SINAICA by December 2007. By the end of this project, another local monitoring network will be recognized as providing them](#)

[Indicator 2: Based on CENICA's report, it is recognized that 15 local monitoring networks has utilized air quality monitoring data for making and evaluating air pollution policy. By the end of this project, 5 more local monitoring network will be recognized as utilizing them.](#)

[Indicator 3: Based on the questionnaire for local governments, 10 local governments has increased the awareness for importance of air quality monitoring.](#)

[Indicator 4: The number of monthly-averaged access for SINCICA has increased from the beginning of this project.](#)

##### Output1:

[Indicator 1-1: The six standard manuals on air quality monitoring in Mexico were prepared and revised by May 2007. Those manuals were also approved by General Director of CENICA.](#)

[Indicator 1-2 and 1-3: At least two CENICA staffs can lecture on 1\) overview of air quality monitoring, 2\) monitoring network design, 3\) installation of monitoring equipment, 4\) operation, maintenance and calibration of monitoring equipments, and 5\) QA/QC at seminars, and acquire steps to conduct audit on air quality monitoring stations.](#)

[Indicator 1-4: Design or Locations of air quality monitoring network were already evaluated in one model city and the report will be prepared by the end of March, 2008. For the another model city, the evaluation will be implemented by the end of this project.](#)

[Indicator 1-5: QA/QC procedures were improved using the standard manuals in one model city, and will be improved in another model city by the end of project.](#)

[Indicator 1-6: From 2006-2007, the seminar/training workshop on proper air quality monitoring were held, and staffs from the 80% of existing local monitoring networks participated in them.](#)

[Indicator 1-7: By the end of this project, the report for air quality monitoring will submit from 22 local monitoring networks\(88% of existing local monitoring networks\) and necessary actions to implement the standard air quality monitoring will be identified by the submission.](#)

##### Output2:

[Indicator 2-1: A master plan on the improvement of the existing air quality monitoring equipment calibration system was composed and approved by General Director of CENICA at December, 2006.](#)

[Indicator 2-2: At least two CENICA staffs can lecture on calibration of 8 types of monitoring equipment which CENICA have owned.](#)

[Indicator 2-3: At least one staff member of 96% of existing local monitoring networks acquired](#)

calibration methods of air quality monitoring equipment based on standard manual.

Indicator 2-4: 46 necessary SOPs were prepared, and CENICA have been acquiring ISO17025 accreditation (NMX-EC-17025-IMMC-2006) as calibration laboratory.

### **Output3:**

Indicator 3-1: This indicator will be achieved by the end of this project described as “Indicator 1-4”

Indicator 3-2: A group of experts on the use of different models including dispersion, receptor, meteorological, photochemical, transport was formed in CENICA

### **( 2 ) Effectiveness**

Judging from the degree of achievement of the Objectively Verifiable Indicator, the Project Purpose has been mostly achieved and is expected to be fully achieved by the end of the Project. The Outputs are confirmed to have contributed to the achievement of the Project Purpose. The Project is considered to be effective.

Indicator 3-3: Field survey for scientific information based on the measurement of VOCs was implemented in one model city and the report has been making. For another model city, the field survey and making report will be implemented by the end of project.

Indicator 3-4: Field survey for scientific information based on the measurement of PM2.5 was implemented in one model city and the report has been making. For another model city, the field survey and making report will be implemented by the end of project.

### **Output4:**

Indicator 4-1: The standard manual on air quality monitoring data management was revised and the monitoring data analyzing tool was prepared.

Indicator 4-2: Two staff of INE including CENICA can lecture on air quality monitoring data management and basic analysis.

Indicator 4-3: Two local governments (Salamanca and Puebla) reviewed the method of utilizing based on the results of the air quality monitoring data analysis.

Indicator 4-4: Staff of 88% of the existing local networks participated in the workshop for monitoring data management and data analyzing tool at July, 2007 in Mexico city.

### **Output5:**

Indicator 5-1: The ratio of data transmission to SINAICA have increased from 44.5% at the beginning of this project to 79.2%

Indicator 5-2: Additional 7 local monitoring networks have connected to SINAICA from the beginning of this project.

Indicator 5-3: Air quality information communication media was installed in one model city and the budget for installing the media was applied in another model city.

Indicator 5-4: Program manager in charge of environmental program in local governments will be invited in the international seminar to report and share this project’s output held in September, 2008.

### **Output6:**

Indicator 6-1: Final draft of “The National Air Quality Monitoring Program (PNMA) 2007-2012” will be prepared by June 2008.

### **Overall Goal:**

Based on achievement by this project and the contribution of CENICA in implementing Mexican environmental policy, the following indicators for overall goal will be achieved; the number of the local networks whose air quality monitoring data are utilized in policy planning or evaluation by the federal government, the number of research papers on health risk, impacts on ecosystems, and economic losses due to air pollution, the number of local governments that have established an air pollution contingency plant, the number of local governments that utilize air quality monitoring data for policy planning or evaluations, budgets for air quality management measures at the federal and local level.

### **( 3 ) Efficiency**

The Inputs from both Japanese and Mexican sides have been generally appropriate in terms of timing, quality and quantity in order to produce the Outputs.

Japanese side: Japanese input (expert, equipment and training) has been implemented as generally scheduled though the allocation of expert has increased than planned because of important assumptions of retirement of some C/P. Problems related to maintenance attributable to the International Procurement of advanced equipment have been observed, including difficulty of obtaining spare parts in the local market, lack of local expertise in diagnosing and fixing the malfunction and failure. The equipment such as GC-MS delivered in March 2007, which procedure of installation started since then, has been in the process of conditioning. This can be attributed to administrative and technical reasons among others. (It is expected to be operational in March 2008).

Mexican side: Quantity of the staff allocated to the Project was not sufficient especially in the beginning, considering the scope and volume of envisaged activities. Through the effort of the C/Ps and the support of the J/E team, the adverse effects on the production of the Outputs have been minimized. But the problems have put additional burden to the C/Ps, who are already busy. It is noted that, despite of the difficulty in increasing the staff members of Federal Government under the current political circumstance, CENICA made a good effort to secure the budget for three temporary posts for technical engineers and to request additional six permanent posts to the Federal Government.

Judging from the results of the Objectively Verifiable Indicators, production level of the Outputs is steady and it is expected that all of the Outputs would be produced by the end of the Project. Overall, the Inputs of the Project have contributed to production of the Outputs. The Project, therefore, is considered to have been mostly efficient.

### **( 4 ) Impact**

Impacts at the Overall Goal level: The impacts at the Overall Goal level have become visible already. For example, the number of local governments that have established an air pollution contingency plan has been increased. The number of local governments that utilize air quality monitoring data for policy planning or evaluations has been increased, too. It is likely that it would be achieved in 3-5years after the termination of the Project.

Technical aspects: Through working together with Japanese experts in planning, implementing, and problem solving of the relevant activities, technical level of the C/Ps would be raised enough to sustain and develop the effects of the Project by the end of the Project. CENICA is expected to utilize and disseminate the transferred technologies as part of their normal work. The equipment provided by the Project is expected to be utilized fully because it is essential to air quality monitoring. Sustainability

of utilization, however, partly depends on the ability of CENICA to secure financial backbone for maintenance of the advanced equipment that was internationally procured.

Other impacts: Various positive impacts have been observed, especially at local government level. Negative impacts have not been observed. They are not foreseen, either.

## **( 5 ) Sustainability**

Institutional and organizational aspects: The legal and policy support for air quality monitoring is likely to continue. Air quality monitoring is one of the important organizational tasks of CENICA so that it is expected to continue or even strengthen the relevant activities after the end of the Project. While CENICA has a plan to increase the number of the staff member in order to strengthen its institutional capacity, it is uncertain if all of the present C/Ps, whose technical capacity has been developed through the Project, would stay with CENICA in future.

Financial aspects: The Government of Mexico has allocated necessary budget to implement the Project activities. It is likely that financial sustainability is secured

## **2 . Factors that promoted realization of effects**

### **( 1 ) Factors concerning to Planning**

Nothing special.

### **( 2 ) Factors concerning to the Implementation Process**

The Project has been implemented in close collaboration between the Japanese experts and their counterparts. It is notable that CENICA has actively coordinated with other relevant organizations, including Federal, State, and Municipal Governments, universities, civil association, private enterprises, etc, in carrying out the activities.

Communication within each technical field (or Output) is generally sufficient for day-to-day implementation of the Project.

## **3 . Factors that impeded realization of effects**

### **( 1 ) Factors concerning to Planning**

Some parts of PDM such as Objectively Verifiable Indicators for the Outputs, the Project Purpose and the Overall Goal better use more clear phrases for the mutual understanding.

### **( 2 ) Factors concerning to the Implementation Process**

Communication across the technical fields (or Outputs) needs further improvement in order to promote information sharing and common understanding regarding the Project as well as a team spirit.

## **4 . Conclusion**

The Project has been confirmed to be proceeding smoothly as a whole and the capability of CENICA has been steadily enhanced. The Inputs of the Project, such as the experts, the counterpart personnel, equipment, machineries and the operational budget were arranged in order almost as planned by both the Mexican and Japanese sides. Consequently the Outputs and Project Purpose aimed at on the PDM have been almost accomplished.

The contribution of the Japanese experts and the efforts by the Mexican counterparts has been clearly confirmed through the facts that CENICA is highly evaluated by relevant internal and external institutions such as SEMARNAT, INE, Mexico, D.F. and Local Governments, etc., which the Team conducted interviews with.

The statement of the Director of Environment of Guanajuato (from the interview with the Team on February 11, 2008) is encouraging, his being confident to solve the air pollution problems in Salamanca, which is one of the model cities for the Project, before the year 2012 through self-help efforts now that the data and information of the existing monitoring stations after QA/QC activities are found credible by those who may concern the air pollutions over the city.

It was required to speed up the allocation of the contracts of the three temporary technical engineers, in order to assure their permanence in the area, and whose assistances are essential for the activities related to the calibration laboratory. (Their contracts for the year 2008 are in process according to the federal regulations)

And it is at most significant that the Project has just paved the road, through JICA's technical cooperation, to grasp the more correct information on the air conditions of those local cities.

Therefore, it can be generally concluded that the original target of the Project has been practically accomplished with some visible positive impacts, so that the Project shall successfully be terminated in October 11, 2008 as planned in the R/D.

## **5 . Recommendations**

### **5.1 Before the End of the Project**

(1) The allocation of the three(3) temporary technical engineers at Tecamachalco, through the formal contract, has to be completed.

(2)The plan of putting the Standard Flow Meter in order, either by repairing, newly procuring, or substitution, has to be determined as soon as possible.

### **5.2 After the Project**

- (1) Sustaining the CENICA operation in grasping the air quality of local cities
- (2) Developing air pollution modeling
- (3) Consolidation of the SINAICA network
- (4) The opportunity of exchange communications among local cities in SINAICA

## **6 . Lessons Learned**

- (1) Maintaining good communications among the Project participants
- (2) Preparation of well designed PDM
- (3) Assignment of the leading and first-class Japanese experts in specialized subjects
- (4) Maintaining a flexibility in the operation of the Project