

SUMMARY REPORT  
BY  
THE MISSION FOR ENVIRONMENTAL ENGINEERING  
(AIR POLLUTION CONTROL)

MEXICO

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## 1. OBJECTIVE

The objectives of this mission are as follows:

- (1) To evaluate the course "Environmental Engineering (Air Pollution Control)" by conducting the research on how much the result of the training is applied and has affected the concerned field areas in Mexico
- (2) To research the overall sector of this training field in Mexico and understand the corresponding problems and needs
- (3) To improve JICA's future training program in the field of air pollution

## 2. PERIOD

From November 6 to November 10

## 3. MEMBERS

- (1) Mr. Hidefumi IMURA (Director)  
Professor, Graduate school of Engineering, Nagoya University
- (2) Mr. Kazuaki TAKAHASHI (Technical Conductor)  
Technical Officer, Automotive Pollution Control Division, Air Quality Bureau, Japan Environment Agency
- (3) Ms. Hiromi SAWADA (Training Planning)  
Officer, Training Division, Hachioji International Training Center, JICA

## 4. SCHEDULE OF THE MISSION

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|--------|--|
| Nov. 7 | Courtesy visit to the Embassy<br>Courtesy visit to the Ministry of Foreign Affairs of Mexico (Intl. Cooperation Division)<br>Courtesy visit to the JICA Office<br>Visit to Environmental Health Office of the Ministry of Health |
| Nov. 8 | Visit to the PROCURADURIA FEDERAL PROTECCION AL AMBIENTE (PROFEPA)<br>Visit to the RED AUTOMATICA DE MONITOREO ATMOSFERICO (RAMA)<br>Visit to the Environmental Secretariat of the Mexico City Government                        |
| Nov. 9 | SEMINAR<br>LUNCH/ RECEPTION<br>Meeting with Ex-participants in the JICA Office   |

Nov. 10 Visit to the INSTITUTO NACIONAL DE ECOLOGIA (INE)

Report to the JICA Office

Report to the Embassy

## 5. INSTITUTIONS WHERE THE MISSION VISITED

The Ministry of Foreign Affairs of Mexico (Intl. Cooperation Division)

Environmental Health Office of the Ministry of Health

The PROCURADURIA FEDERAL PROTECCION AL AMBIENTE (PROFEPA)

The RED AUTOMATICA DE MONITOREO ATMOSFERICO (RAMA)

The Environmental Secretariat of the Mexico City Government

The INSTITUTO NACIONAL DE ECOLOGIA (INE)

## 6. SUMMARY REPORT

The follow-up team visited 6 governmental organizations, 5 being federal and 1 municipal. The team held a seminar on Air Pollution Control in Mexico and Japan, where 36 experts were present from 8 Mexican environmental and international cooperation organizations, Japanese Embassy and JICA Office in Mexico. Among seminar participants were 5 ex-participants of the group training course in Environmental Engineering (Air Pollution Control). After the seminar, the team held a meeting with ex-participants.

### (i) Evaluation of the JICA training courses provided by the visited organizations

The team visited the above-mentioned government organizations and met a number of senior officials in charge of the actual environmental policy implementation in the federal government and Mexico City. They provided the most updated information about the current environmental conditions and policy measures adopted in Mexico. They also gave a number of constructive comments and advice about the JICA training programs as follows:

- International Cooperation Division of the Ministry of Foreign Affairs of Mexico. The team met Mr. Efraim del Angel and Ms Sunica Sanitiesteban Jimenez. Mr. del Angel expressed his evaluation that the cooperation provided by Japan through JICA programs has made great contribution to the enhancement of air pollution control measures in Mexico. He mentioned that there have been several cooperation programs on specific air pollution topics supported by other countries, but he stressed that none of them were so comprehensive as the cooperation projects with Japan. He pointed out the central role that CENICA plays in the capacity building, not only in Mexico but also in other Latin American countries, in view of the

increasing importance of regional and environmental cooperation among Latin American countries which have similar economic, social and cultural background and faced with similar environmental problems. He stated that CENICA's continuous effort for environmental capacity building would be essential for the sustainability of its activities as a technical center for environmental control. He expressed that the training programs for middle-level experts would be most beneficial for Mexico. He also mentioned that special training programs for Mexican experts in Japanese universities would also be beneficial since strengthening of cooperation between academia and administration is very important for Mexico. With respect to the qualification of experts dispatched to Japan, he said that there is no manual or definitive selection criteria, however, they take into account such factors of the candidates as their educational background, post in the organization and ability to carry out creative jobs. He admitted that sometimes they are obliged to simply endorse the candidates nominated by relevant government organizations, considering they do not have sufficient information of the candidates. He stressed, though, that they are trying to select persons who are supposed to play core roles in their respective organizations, and the performance of most JICA ex-participants in training courses are good.

- Environmental Health Office of the Ministry of Health. The team met Mr. Alberto Martinez, Ms. Maria del Carmen Gonzalez and Rosa Evelia Manzano, an ex-participant of 1995 JICA training course in environmental technology. Mr. Martinez explained the role of the Ministry of Health in the air pollution control. The Ministry is mainly responsible for the setting and enforcement of environmental standards, while RAMA and CENICA are in charge of air quality monitoring. He identified two priority areas in need of Japanese cooperation, that is: (a) training of technical experts with knowledge and skill of fundamental environmental purification technologies, and (b) special training of experts for advanced monitoring and information processing technologies. He mentioned that Mexico is like an experimental field of air pollution problems, where new issues are coming out one by one and international cooperation is very beneficial to cope with the emerging problems. He also mentioned that studies on health damage, risks and cost of air pollution is very important and it will be favorable for Mexico if any study program on this question is considered by JICA. He also stated the importance of regional cooperation among Latin American countries. Ms. Manzano presented her positive evaluation of the training course she participated. She mentioned that the course enabled her to have a panoramic view of the broad scope of air pollution control policy and technology.
- The PROCURADURIA FEDERAL PROTECCION AL AMBIENTE (PROFEPA). The team was welcomed by Mr. Antonio Azuela, Attorney General of the organization, and Ms Norma

Munguia, Coordinator of International Affairs. Mr. Azuela explained that PROFEPA was created in 1991 to conduct inspection and enforcement of environmental regulation. It has 3,000 employees, and 500 of them are inspectors who make impromptu and unsolicited visits to industrial facilities in the whole country. PROFEPA is authorized to issue sanction against industries that do not comply with the standard. About 200 factories were closed by its order in 1991, and non-compliance rate decreased sharply thereafter due to the effective inspection program implemented by PROFEPA. Thus, the inspection by PROFEPA and the monitoring by RAMA and CENICA are like two wheels of a cargo, and they play complementary roles to each other. Ms Munguia mentioned that a number of experts of PROFEPA already participated in five JICA training courses, and the training they received had been very useful to their performance and activities in PROFEPA. Mr. Azuela mentioned that they have introduced a voluntary audit scheme according to which industries themselves can make their own compliance programs, but he expressed his doubt about on the applicability of ISO14000 type voluntary schemes to the current Mexican situation for the obvious reason that it can hardly serve as compliance substitute.

- The RED AUTOMATICA DE MONITOREO ATMOSFERICO (RAMA). The team was welcomed by Mr. Jose Luis Pedroza Serrano, the Director General of the organization. RAMA has about 50 staff members, and about 90 per cent of them including Mr. Pedroza himself have received training in Japan. He expressed his high evaluation of JICA's training programs. The team observed the facilities and equipment of RAMA, and was impressed by its monitoring network system that has been improved very rapidly in a relatively short time. The team received a brief lecture about the air pollution in Mexico City. 75 per cent of pollutants in Mexico City come from automobiles. They have already introduced various measures to control the traffic volume in the City as well as to strengthen the exhaust gas inspection of cars. In spite of these measures, however, air quality in the City has shown only a very slight improvement in recent years. Mr. Pedroza pointed out the importance of public awareness and environmental education for drivers, and suggested a possible JICA program on environmental education.
- The Environmental Secretariat of the Mexico City Government. The team met with Ms Diana Ponce, Director-General for Planning and Environmental Policy. In 1997, the City had the first mayor elected by public vote, and the Environmental Secretariat of the Mexico City was created at that time. Ms Ponce explained the activities of the Metropolitan Environmental Commission of Mexico, members of which being the Federal Government, the State of Mexico and the City of Mexico. She mentioned that there has been significant improvement in the control of air pollution in Mexico City area, and her division is dealing with wider agenda

including not only air pollution control but also water resource and municipal solid waste management. She mentioned that the environmental administration and public service works for municipal wastewater treatment and solid waste disposal are not well coordinated in Mexico City. She likewise informed the team that her Secretariat sent experts to Japan to participate in JICA training courses on soil pollution and hazardous waste treatment. She expressed her positive evaluation on the content of JICA courses. Finally, she pointed out the importance of environmental education and the need for creating an additional course, other than the established technical ones, that can deal with the methods of managing social issues in order to make it more applicable and effective in Mexico.

- The INSTITUTO NACIONAL DE ECOLOGIA (INE). The team first met with Dr. Victor Hugo Paramo, General Director of Atmospheric Information Management, and then Dr. Adrian Fernandez, General Director of Environmental Management and Information. Dr. Paramo expressed his appreciation for Japan's support to INE, and he made his comments as follows: INE had to build up its institutional capacity for environmental management and control very promptly in the last years, but it did not count on enough members with professional expertise. At that time, the environmental training courses provided by JICA were very beneficial for INE and other Mexican organizations, inasmuch as there were not any other such training courses than those provided by JICA. Presently, Mexican organizations have acquired a considerably high level of professional knowledge and skills, and CENICA exists to conduct training of experts within Mexico. From now on, differentiation of the nature and objectives of training courses of JICA and CENICA may be necessary. Training courses of CENICA and JICA could be complementary to the country as JICA deals with more advanced and professional subjects. One important recommendation might be the training of trainers who will provide training workshops in Mexico upon receiving training in Japan. At the end of visit, the team had a chance to exchange views with Dr. Fernandez, who has been the key person for the promotion of environmental cooperation between Mexico and Japan. At the time to meet with the team, he was suddenly called to an important meeting in place of his superior. But, he managed to come back to office for the meeting with the team. The team presented to him the brief summary of all the events the team had in Mexico, and had very constructive conversation with him. He expressed his ideas that were almost in the same line with those expressed by Dr. Paramo. He especially emphasized the possible role of CENICA as a center of regional environmental cooperation in Latin America and the importance of long-term training in Japanese universities for experts who will be environmental leaders in Mexico. The team also conducted interviews with two ex-participants of JICA training courses: Mr. Rolando Rios, Director of Environmental Information, who participated in the 1999 group training course on Air Pollution Management conducted in JICA's Osaka

International Center; and Luis Sanchez, Director of Environmental Management, who received a one week individual training in 1998 on the occasion of his participation in the OECD Seminar on PRTR (Pollutants Release and Transport Register) held in Tokyo. Both of them assume an important position in INE, and they told the team that the training in Japan was very beneficial and useful for them and they wish to return to Japan if they are given another chance. There were a larger number of participants in various JICA training courses who were sent from INE, but some of them have resigned from the organization to start their own businesses or move to private companies such as consulting firms, among others. The follow-up of these persons would be necessary.

(ii) Seminar on Air Pollution Control in Japan and Mexico. The seminar was held with 36 participants from 10 organizations. Following the opening speech by Mr. Sakurai, Vice-Director of the JICA Mexico Office, three presentations were made by Japanese and Mexican experts:

- Prof. H. Imura: Japan's Environmental Policy and International Environment Cooperation
- Mr. K. Takahashi: Measures in Japan against Environmental Pollution caused by Vehicles
- Ms. A. Sanchez: Actual Situation of National Atmospheric Monitoring in Mexico

After these presentations, one hour was fully spent for questions and answers. There were ceaseless questions by participants about environmental policy measures in Japan and comments on actual problems in Mexico. Very active and frank exchange of views was made about the current situation and future direction of the environmental cooperation between Mexico and Japan. All the questions and comments were very relevant, demonstrating the high level of knowledge and experience of the participants.

(iii) Evaluation of the JICA training course by the ex-participants

Meeting with ex-participants of the seminar was held in JICA Office after the seminar. 5 ex-participants were present, and 2 experts who attended the seminar joined the meeting as observers. All the ex-participants expressed their appreciation to Japanese government and JICA for giving them a chance to receive training in Japan. All of them stated that what they learned in the training course was very advantageous for them in their execution of their works in their respective organizations. One ex-participant, however, reported that he had to resign from his post due to the restructuring of his institution and it was a great regret for him. They commented that the general structure of the training course was good, requiring no drastic modifications. They, however, made some constructive suggestions to make the course more effective and useful:

- The course should pay attention to the changes and the specific national conditions in different countries
- The course should give more opportunities to experts in local areas other than Mexico City since Mexico is composed of 31 states and Mexico City capital.

- At the time of political restructuring in Mexico which is scheduled to take place very soon (December 2000), governments of Japan and Mexico should make continuous consultation to exchange views about changing needs, and strengthen cooperation. In addition, Japan must also be aware of the political system in Mexico wherein no government employee is secured from his/her post depending on the administration, that is, in spite of the desire to apply what has been acquired in Japan, there are occasions when upon return to their home country (Mexico), their posts would not be available any more. It is recommended a modified system of collaboration and cooperation between the 2 governments.
- The group training is good for Mexican participants to acquire knowledge of the situation in other countries and make self-evaluation of the Mexican situation, while individual courses on specific topics would be also beneficial

Some ex-participants expressed their interest in the subjects such as accreditation system of "clean industry", clean production technology, and noise control. Some participants expressed their wish that the course will allow the participation of experts from private sector.

#### (iv) Needs for JICA training courses and other programs

According to the above information obtained, the team would like to make the following evaluation of the group training course in environmental engineering (air pollution):

- The course has met the needs of Mexican environmental authorities, and it is highly appreciated by them as useful and relevant
- There is no need for drastic modification of the course, but it should take into account the changing conditions of the countries
- Customized courses to meet with specific and advanced needs would be beneficial for Mexico, in addition to the existing group training courses including the one on environmental engineering (air pollution) dealing with general topics.

Moreover, there were requests and comments on the direction of the courses related to environmental issues:

- Complementary roles of training courses of JICA and CENICA should be examined, as many people have already received training in Japan, and CENICA can conduct training within the country. In this regard, more advanced training of trainers would be an important subject for consideration.
- Some senior officials of Mexico expressed their ideas about the need of training courses in water, solid waste management, environmental education, and management of social issues. In this regard, it will be necessary to make a comprehensive evaluation of all the courses related to environmental issues.
- It is also important to examine the possible role of CENICA as a training center in Latin American region.

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SAO PAULO

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## 1. OBJECTIVE

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- (2) To research the overall sector of this training field in Mexico and understand the problems and needs there
- (3) To improve the JICA's future training program in the field of air pollution

## 2. PERIOD

From November 11 to November 18

## 3. MEMBERS

- (1) Mr. Hidefumi IMURA (Director)  
Professor, Graduate school of Engineering, Nagoya University
- (2) Mr. Kazuaki TAKAHASHI (Technical Conductor)  
Technical Officer, Automotive Pollution Control Division, Air Quality Bureau, Japan Environment Agency
- (3) Ms. Hiromi SAWADA (Training Planning)  
Officer, Training Division, Hachioji International Training Centre, JICA

## 4. SCHEDULE OF THE MISSION

- Nov. 11    Courtesy visit to the JICA Office
- Nov. 13    Visit to Usina Leopoldina (municipal solid waste treatment factory)  
              Observation of urban transportation condition in Sao Paulo City  
              Visit to Ibirapuera Park (air pollution monitoring station located in the park)
- Nov. 14    Visit to IPEN-Institute de Pesquisas Nucleares  
              Visit to Secretariat for the Green and Environment, Government of the City of Sao Paulo
- Nov. 15    Visit to Cubaton Industrial district
- Nov. 16    Seminar at Environmental Sanitation Technology Company (CETESB)  
              Observation of CETESB  
              Visit to International Department, Environmental Agency of the State of Sao Paulo

## 5. INSTITUTIONS WHERE THE MISSION VISITED

- Usina Leopoldina
- IPEN-Institute de Pesquisas Nucleares
- Secretariat For The Green and Environment, Government of the City of Sao Paulo
- Environmental Sanitation Technology Company for the State of Sao Paulo (CETESB)
- Environmental Agency of the State of Sao Paulo

## 6. SUMMARY REPORT

The follow-up team visited the environmental departments of the City of Sao Paulo and the State of Sao Paulo, i.e., Secretariat for the Green and Environment of Government of the City of Sao Paulo; Environmental Sanitation Technology Company for the State of Sao Paulo (CETESB); and Environmental Agency of the State of Sao Paulo. In these institutions, the team had meetings with high level officials in charge of environmental administration of the municipality and the state and made interviews with ex-participants of the JICA group training course in environmental engineering (air pollution) and other training courses in the field of environment. The team also held a seminar on Air Pollution Control in Brazil and Japan. In addition, the team visited the Leopoldina factory for municipal waste treatment in Sao Paulo City, IPEN-Institute de Pesquisas Nucleares which is in the campus of the Sao Paulo State University and the industrial district in Cubatao City, in order to observe the actual environmental situation in the Sao Paulo City and its suburban area.

### (i) Evaluation of the JICA training courses provided by the visited organizations

- Secretariat for the Green and Environment, Government of the City of Sao Paulo. The team had a meeting with Mr. Ricardo Ohtake, the Director-General of the Secretariat, together with four officials in charge of air pollution control in Sao Paulo City. Mr. Ohtake expressed his thanks to JICA for its assistance to various programs of the City of Sao Paulo. He stated that they are now conducting a project to prepare "environmental maps" of the City, and would like to have technical and scientific cooperation with Japan on the methodological aspects of the project. He explained the need of environmental monitoring stations which the municipal government would like to establish in addition to the existing stations operated by the CETESB. He also mentioned the importance of environmental education and the solution of poverty issues, and expressed his wish to promote international cooperation on these subjects. Following the meeting with Mr.

Ohtake, Mr. the team received a briefing about the organization and responsibilities of the environmental administration of the City of Sao Paulo.

- Environmental Sanitation Technology Company for the State of Sao Paulo (CETESB). CETESB (Compania de Tecnologia de Saneamento Ambiental) is a public corporation in charge of environmental technology, and it is under the control of the State of Sao Paulo. The meeting and discussions with experts of CETESB were arranged as a seminar mentioned below, and the team visited the atmospheric environmental monitoring center and automobile exhaust gas testing laboratory of CETESB.
- Environmental Agency for the State of Sao Paulo. After the seminar held in CETESB, the team visited the Environment Agency of the State, which is in the same building of CETESB. The team met with Ms Ana Lucia Segamarchi, Associate Director for Special Projects. Ms Segamarchi is in charge of international cooperation projects including those with Japan through programs of JICA, and she is the key person for the promotion of environmental cooperation with the State of Sao Paulo. She has been engaged in various cooperation projects of JICA since 1978 and she visited Japan to explore international cooperation with Japan. She explained how successfully the State of Sao Paulo has developed third country training programs (TCTP). She stated that Brazil has an advantage to develop TCTP especially for Portuguese speaking countries in Latin America and Africa, and expressed her hope to develop new courses such as for waste management in addition to the existing programs such as on forest conservation. She mentioned that the priority for the State had changed because it had already sent a number of trainees to Japan to develop technological capability and it would be more important to develop programs on "management systems" rather than those on technologies.

(ii) Seminar on Air Pollution Control in Brazil and Japan.

The seminar was arranged by CETESB to exchange information on air pollution control in Japan and Brazil, and there were 30 participants from CETESB, the City of Sao Paulo and other organizations, including 8 ex-participants of various JICA training courses. Three presentations were made by Japanese and Brazilian experts:

- Prof. H. Imura: Japan's Environmental Policy and International Environment Cooperation
- Mr. K. Takahashi: Air Pollution Control for Automobiles in Japan
- Mr. Homero Carvaiho: Air Pollution Control for Automobiles in Brazil

After the two Japanese presentations, there were a number of technical questions about air pollution control in Japan. Many questions and comments were made by ex-participants of the environmental

training courses of JICA. They had high professional knowledge about air pollution control technologies, especially for automobiles, and it was a good demonstration that the knowledge they acquired in Japan proved useful for executing their works in their respective organizations.

(iii) Evaluation of the JICA training course by the ex-participants.

Two meetings with ex-participants were arranged on different occasions. The first meeting was arranged on the occasion of the visit to the City of Sao Paulo. The team had a group interview meeting with four ex-participants of JICA training courses in the field of environment. The second meeting was held in CETESB after the seminar, and the team made a group interview with eight ex-participants. There were two ex-participants of the group training course in environmental technology (air pollution), others being the ex-participants of diverse group and individual training courses for water pollution control, waste management, automobile safety and pollution control technology, and environmental administration. There were few specific comments on the group training course in environmental technology (air pollution), as most of them were participants of other courses. Nevertheless, their comments and suggestions were relevant to the JICA training courses in the field of environment including that in environmental technology (air pollution). All of them expressed their general satisfaction with the content of the courses and the stay in Japan, and stated that the knowledge and expertise they acquired in Japan proved very relevant and useful for their professional works in their organizations. Some of them, however, commented that the topics of the courses they participated were rather general and did not deal with the details of topics they wished to learn. The following are the summary of their comments and suggestions:

- It is difficult to meet the needs of participants from various countries with different national conditions. The courses, therefore, should be divided into general courses and specific courses in order to satisfy the different needs.
- Customized courses to meet the needs of individuals or countries with similar situations will be useful and beneficial for a country like Brazil which has already acquired a good deal of technical knowledge.
- Two types of topics should be dealt with, one on technological issues and the other on management issues. From now on, for a country like Brazil, training on "management issues" will be more beneficial than pure technological issues.
- More detailed information about the content of the course should be announced in advance so that participants can have clearer idea about the course.
- Participants were very well attended and they could feel easy with the life in Japan.
- The schedule was rather tight. It will be very beneficial if participants can spend a week or so to deepen their study on their special topics.
- Some courses which have been already expired seem still relevant and useful for Brazil.

In addition, there were number of specific requests and suggestions and they will be reported elsewhere.

(iv) Needs for JICA training courses and other programs

Based on the meeting with officials responsible for environmental administration and international cooperation in the City of Sao Paulo and the State of Sao Paulo and interviews with ex-participants of JICA training courses, the team would like to make the following evaluation of the group training course in environmental engineering (air pollution).

- The course has met the needs of environmental authorities of the State of Sao Paulo and the City of Sao Paulo, and it is highly appreciated by them as useful and relevant.
- The ex-participants in the environmental training courses including that in environmental engineering (air pollution) are playing a key role in environmental administration in the City and the State of Sao Paulo. Some ex-participants moved to private consultancy companies and others, but they continue to work in environmental field, keeping close contact with the environmental authorities of the City and the State.
- There are about 1,200 ex-participants of JICA training courses in Sao Paulo area, and they form a group called ABJICA. The number of ex-participants of environmental courses only is as large as about 100, and they form a powerful pro-Japan group, and their role will be very important for the promotion of international cooperation between Brazil and Japan.
- In view of the Brazilian current situation, especially that of Sao Paulo, customized courses to meet with their specific and advanced needs should be considered.
- Courses to deal with management issues will be useful, and meet the actual need of the City and State of Sao Paulo.
- However, Brazil is a large country with geographical diversities. The course should also take into account the needs of other regions other than Sao Paulo.

Furthermore, the State of Sao Paulo and CETESB have already conducted TCTP (third country training programs) in environmental field. Their continuous involvement in TCTP will be important for the promotion of regional environmental cooperation programs of JICA in Latin America and Africa where Portuguese is used.







JICA