

Terminal Evaluation

Middle East

1. Outline of the Project

Country:	Syrian Arab Republic
Project title:	Capacity Development on Environmental Monitoring of Directorates for Environmental Affairs in Governorates in Syrian Arab Republic
Issue/Sector:	Environmental management
Cooperation scheme:	JICA Technical Cooperation Projects
Division in charge:	Second Group, Global Environment Department, JICA
Total cost:(at the time of evaluation)	406,730,000 yen
R/D	September 9, 2004
Cooperation period	3 years January 15, 2005 to January 14, 2008
Partner Country's Implementing Organization:	General Commission for Environmental Affairs (GCEA) and 14 Directorates for Environment Affairs (DFEA) , Ministry of Local Administration and Environment (MOLAE)
Supporting Organization in Japan:	Ministry of the Environment
Other related cooperation:	None in particular

1-1 Background of the Project

In Syria, industrialization has been expanding ever since the 1980s and in addition to large-scale plants such as thermal power generation plants, petroleum refining plants, cement plants, and fertilizer plants, etc., medium and small-sized plants such as metal factories and dye works plants have been operating in the suburbs of large metropolitan areas. As the environmental problems caused by waste water and exhaust gas discharged from these plants have become serious around the cities, the Syrian government established the Basic Law of Environment (Decree No. 11) and the Ministry of Environment in 1991.

In addition, in order to resolve the environmental problems that were spreading throughout the nation, the Ministry of Environment inaugurated 5 Directorates for Environment Affairs (DFEAs) in 1996, and continued to establish a DFEA in each of the 14 governorates by January 2004. These DFEAs are responsible for environmental administration, environmental monitoring, and educational activities for residents in each governorate, but were struggling with a lack of technical capacity and materials, etc. Based on this situation, the Syrian government requested technical cooperation from the Japanese government regarding capacity development for the DFEAs in July 2002.

Based on the above background, JICA established a 3-year plan starting in January 2005 for a technical cooperation project entitled "Capacity Development on Environmental Monitoring of Directorates for Environmental Affairs in Governorates in Syrian Arab Republic," with the Syrian Ministry of Local Administration and Environment (MOLAE) as the counterpart (C/P) agency.

1-2 Project Overview

(1) Overall goals

Environmental monitoring system and publication of the monitoring results are introduced at and spread to all the Directorates.

(2) Project Purpose

The target Directorates for Environmental Affairs in Governorates are capable to introduce and conduct regular monitoring of required parameters for water and air quality according to the monitoring plan formulated by the Directorates themselves and to implement activities for public awareness including publication of the monitoring results.

(3) Outputs

In the target Directorates:

1. Technical level of laboratory staff concerning environmental sampling and analysis is improved.
2. Laboratories are properly managed by laboratory staff themselves
3. Environmental analysis data is accumulated and properly managed.
4. Laboratory staff is able to formulate an environmental monitoring plan specifying parameters required.
5. The results and data acquired by the Project is open to and shared with the citizens of the target Directorates. Staff of target Directorates is able to formulate its action plan for public awareness and environmental education.

(4) Inputs (at time of evaluation)

Japan side:

Dispatch of experts: 95.47MM

Provision of equipment: 139,262,000 yen

Counterpart training in third country (Egypt): 19 people

Counterpart training in Japan: 1 person

Syrian side:

Counterpart: 126 personnel (GCEA and DFEAs)

Land and Facilities, transportation for sampling

Local cost (reagent) 5 million Syrian pounds

2. Evaluation Team

Members of Evaluation Team	Leader: Kenichi Tanaka, Senior Advisor, Japan International Cooperation Agency (JICA) Cooperation planning: Reiko Shindo, Associate Expert, Environmental Management Team 2, Global Environment Dept. JICA Project evaluation: Yasuyo Hirouchi, Permanent expert, International Development Associates, Ltd.
Period of Evaluation	July 22, 2007 to August 11, 2007
Type of evaluation	Terminal Evaluation

3. Results of Evaluation

3-1 Actual achievements

The following were largely accomplished as results.

- 1) Result 1: 74.2% of all DFEAs' laboratory staff were able to conduct monitoring based on the SOP (Standard operating procedures), and this is expected to increase to 80% by the time the project is complete.
- 2) Result 2: 82.1% of all DFEAs' laboratory staff were able to carry out management of equipment, components, consumables, and test reagents based on the operation and maintenance guideline.
- 3) Result 3: 50,577 total data analyses for the fields of water quality and air quality were conducted, of which data for 42% was accumulated in a database.
- 4) Result 4: Monitoring plans were created by the DFEAs of all 14 governorates in 2006 and 2007. Plans for 2008 are expected to be created in December 2007.
- 5) Result 5: Materials to raise environmental awareness of citizens were created, and 12 workshops and seminars were held as part of activities for environmental awareness in 4 locations as priority DFEAs. In addition, the National Committee for Information and Environmental Awareness was established in October 2005 for the purpose of building an environmental education network.

The Project Purpose is expected to be achieved as follows by the time the project is complete.

- Monitoring of water and air quality is being implemented regularly at all DFEAs laboratories in 14 directorates based on plans created by the DFEAs.
- With regard to the levels of analytical technique for water quality analysis at the laboratories, all DFEAs' laboratories in 14 directorates virtually achieved the target levels, and 3 DFEAs' laboratories targeted for air quality analysis have partially achieved the target levels and are expected to fully achieve the target levels by the time the project is complete.

3-1 Actual achievements

(1) Relevance

It can be considered that the overall goal and project purpose correspond to the needs of Syria and the target groups (including personnel of DFEA and GCEA and local citizens).

In Syria, environmental problems became actualized starting in the 1980s due to industrialization. Regardless of the fact that environmental management based on scientific data was necessary, since the country was struggling due to insufficient technology and equipment for water and air quality analysis, the implementation of this project that aims to support an increase in the environmental monitoring capabilities of DFEAs matches the needs of Syria.

As Syria's "Tenth National 5-Year Development Plan (2006 to 2010)" describes 1) the consistency of implementing environmental policies, 2) capability development of the environmental sector, and 3) the importance of comprehending the current state of the Syrian environment, the overall goal and project purpose comply with the national policies of Syria.

In addition, the project is also consistent with the general framework of Japan's ODA, which defines the "environmental sector" as one of the six top priority issues, as well as with the JICA Country Program (2006), which lists the environment as one of the four top priority items.

The project design targets regions where air pollution and water pollution are the most serious, and as it resulted in the transferred technology being unflinchingly used at actual sites, the project design is thought to have been adequate. For some DFEAs, the project design would have been more adequate if regional characteristics were taken into consideration when selecting parameters and analytical fields.

In Japan, there were serious problems with air pollution and water pollution in the 1960s, but the Japanese government has overcome these problems through dissemination of environmental technology based on executing relevant laws and on monitoring results. This project makes use of this experience and demonstrates the edge of Japan's technology.

(2) Effectiveness

The indicators for the project purpose were nearly achieved, with the exception of disclosure of monitoring results. With regard to disclosure of monitoring results, an annual report on monitoring results is in the process of being created. Since approval by a third-party laboratory such as the Syrian Atomic Energy Commission (AEC) or the Syrian government is necessary in order to disclose monitoring results, the laboratories of several DFEAs are aiming to obtain approval by participating in the AEC's "Program for Quality Control of Laboratory Analysis." In the mid-term evaluation, it was confirmed that "the GCEA has a policy of disclosing all of the data obtained in DFEA laboratories through annual reports and through their home page" in a consensus document with the Syrian government, and there are expectations for continued efforts to disclose monitoring results based on DFEAs.

As a result, the project purpose is expected to be largely achieved by the time the project is complete. The outputs of the project have contributed to the achievement of the project purpose, and the project is considered as being effective.

(3) Efficiency

Inputs by both the Syrian side and the Japanese side were conducted appropriately as a whole, in terms of timing, quality, and quantity. Inputs by the Syrian side:

The Syrian side provided the necessary space for development of laboratories at the start of the project. In 2007, the laboratories located in Aleppo, Homs, Hama, Dar'a, and Quneitra moved to new buildings and underwent improvements. Laboratory staff members were suitably assigned, and there were no problems with timing. The budget for the DFEAs was put into effect between January to February, and the necessary budget was distributed.

Inputs by the Japanese side: The timing and period for the dispatch of experts were generally appropriate, and the quantity, items, specifications, and quality of the provided equipment were also generally appropriate. The Syrian side recognizes that experts with technical capabilities in fields that match their needs were dispatched. For activities for air quality analysis, changes in the timing for the dispatch of experts and in the process planning were inevitably made due to delays in

procurement of equipment, but this did not result in any large delays in the progress of the project thanks to the efforts of the team of experts.

With regard to items that should be fulfilled in smoothly implementing the project (external conditions (1)“Laboratory staff trained by the Project stay in laboratories and keep working on the environmental monitoring.,” (2) “Appropriate number of laboratory staff who have chemical background are assigned.” and (3) “Adequate wastewater treatment facility shall be prepared before starting laboratory chemical analysis training in DFEAs”), the following issues and responses were taken, and it is necessary to take heed of their progress.

- 24% of the laboratory staff who were assigned up until now have left due to reasons such as a career change, etc., and there were cases where replacements were not assigned for long periods of time, indicating that there is a problem with insufficient laboratory staff. The GCEA is also aware of this problem, and submitted a formal letter in July 2007 to the Minister of the MOLAE requesting to increase the number of laboratory staff by approximately 50 people. Although improvements are expected to be made in the future, it is thought that it would have been more efficient if laboratory staff were assigned without any shortages throughout the entire project period.
- As the many of the laboratory staff who were assigned did not have sufficient knowledge on chemistry before the project started, the team of experts had to teach the staff basic chemistry, which resulted in a great deal of time being consumed. However, most of the staff had a desire to learn, and since there were even people who worked for extra hours voluntarily without complaining, this has not had serious negative impact on the achievement of outputs up until now.
- With regard to disposal of waste from laboratories, the GCEA set up wastewater treatment facilities at the Damascus DFEA, but these facilities are still not in operation due to technical problems that cannot be solved by local contractors. As liquid waste is currently being stored at the Damascus DFEA, it is necessary to solve this problem quickly and dispose of the liquid waste appropriately.

As described above, there have been issues up until now, but most of these issues are in the process of being resolved through cooperation between the Syrian side and the Japanese side, and their impact on the achievement of outputs has become alleviated. All outputs are expected to be achieved by the time the project is complete, and the project has, in general, been implemented efficiently.

(4) Impacts

Impacts on the overall goal level: From the results of verification based on the indicators described below, the overall goal is expected to be generally achieved in 3 to 5 years after the completion of the project.

- The 3 DFEAs (Damascus, Homs, and Aleppo) that are targeted for air quality analysis are implementing monitoring based on plans that they have created themselves, and the basic requirement for air quality monitoring have been achieved. It is expected that the GCEA will be able to establish a plan for constructing an automatic air quality monitoring system in the future. As the next step, establishment of basic laboratories for air quality monitoring relating to PM10 and TSP in particular at the other 11 locations is expected.
- As the monitoring techniques of the 14 DFEAs have achieved a constant level and the DFEAs play an important role in the national environmental monitoring system, the project goal is in the process of being fulfilled.
- The results of monitoring water quality and air quality are accumulated at the 14 DFEAs, and disclosure of information to citizens in the 14 governorates is expected to be conducted in the near future, in the form of annual environmental reports, data books, etc.

Other impacts: Positive impacts have been generated as described below.

- Through project activities, communication between the DFEAs and the GCEA has become smooth, and opportunities for cooperation and collaboration between local governments and the DFEAs have increased.
- Citizens' trust toward water and air quality analyses conducted by the DFEAs has increased, and their interest in environmental and contamination problems has increased as well.
- The awareness of industries towards environmental protection has increased, and wastewater treatment facilities have been established at some factories.
There have been no negative impacts, and none are expected to arise in the future.

(5) Sustainability

Institutional and systematic aspects: There are expectations for legal and institutional support of environmental monitoring

to be continued. Implementatino of environmental monitoring is one of the important missions of the DFEAs, and therefore, will be continued even after the project ends. At the same time, DFEA laboratories are still not approved officially in quality control, making it difficult for the DFEAs to control contamination sources based on monitoring results, and to utilize the results in applying laws. The GCEA has a plan for increasing the number of laboratory staff, but since the job turnover rate of staff members resulting from career changes, etc., is high, at 24%, it is necessary to motivate staff by giving incentives such as employing lab staff as full-time employees so that they remain at the DFEAs.

Financial aspect: The Syrian government has implemented and enforced budget measures necessary for DFEA laboratories. It is expected that the capability for independent expansion in the financial aspect will be secured.

Technical aspect: At the present time, 118 laboratory staff members have been assigned, and most of the staff are expected to increase their skills up to a level where they can conduct analysis and sampling independently by the time the project ends. However, to aim for further improvement of quality control, it is desired for staff members who have achieved a level where they can conduct analysis independently to transfer their technology to staff who have not yet acquired sufficient technical skills in the form of OJT. There are expectations for the provided laboratory equipment, as well as peripheral equipment and test reagents, to be appropriately used and maintained even after the project completes by following the operation and maintenance manual that was created based on Japan's technical support. It is also predicted that all of the laboratory staff members will have obtained adequate data management abilities by the time the project ends. In addition, based on the standard operating procedures created in the project, a monitoring plan is also expected to be created and updated by the laboratory staff.

3-3 Factors that promoted realication of effects

(1) Factors concerning to Plannning

·None in particular.

(2) Factors concerning to the implementation process

In the implementation process for the project, the following served as factors contributing to the achievement of results.

- Technical support on a practical level (By increasing the capabilities of the staff and developing laboratories at DFEAs, which are local organizations that are physically close to local citizens, laboratory activities to directly resolve complaints from citizens were carried out.)
- Promotion geared toward the industrial sector (Upon holding seminars and workshops that aimed to raise awareness for the industrial sector, some factories installed wastewater treatment facilities, and companies were able to understand the importance of environmental conservation and the necessity of obeying environmental laws.)
- Cooperation by the private sector and the local public (Cooperation by the private sector and the local public who provided electric power supply to be obtained, when conducting sampling, made sampling easier.)
- Active involvement by the governors of governorates and the DFEA directors (For example, a cooperative structure was obtained when implementing monitoring in which the governors of governorates permitted, through the DFEA directors, the use of vehicles owned by the governorate in monitoring activities for the period until sampling cars were provided by the GCEA.)
- Transfer of technology through "round trip training" (Taking into consideration that it is difficult for laboratory staff of regional DFEAs to participate in workshops and seminars held in DFEAs of base cities, the team of experts modified their original plan and implemented "round trip training" for regional DFEAs. Through this system, technology was transferred to all of the 14 governorates, and the understanding of the laboratory staff was gained effectively)
- High motivation of the laboratory staff (The capabilities of the laboratory staff were strengthened, as they had high motivation and some even made efforts for technology acquisition by working extra hours voluntarily.)

3-4 Problematic points and factors that evoked problems

(1) Those related to the plan contents

With regard to procurement of equipment, delays in delivery and installation by local contractors caused the start of operations using the equipment to be delayed, thus resulting in the action plan to be delayed greatly as well. As a result, it was necessary to make adjustments in the procurement of equipment as well as the timing for bringing in experts.

(2) Those related to the implementation process

Due to frequent power outages, the analytical equipment was unable to be operated continuously, affecting the analysis results.

With regard to laboratory staff, the lack of payment of assignment allowance for laboratory activities and overtime allowance, as well as health insurance costs, was one of the reasons why some of the staff members left their jobs.

3-5 Conclusion

As input and activities were affected by the procurement of equipment and materials, etc., taking up more time than predicted, air quality monitoring is progressing behind schedule, but since the outputs and project purpose described in the current PDM are judged as being expected to be virtually achieved by January of next year, this technical cooperation project will be completed on January 14, 2008 as according to the R/D signed on September 9, 2004.

Although the foundation for a water quality monitoring system was built based on this technical cooperation, with regard to air quality monitoring for which modifications to the original plan arose due to delays with the equipment, it is desired for technical support to be implemented more efficiently until the project is complete. In addition, there are expectations for the GCEA and DFEAs to improve the accuracy of water quality and air quality monitoring and to disclose information relating to monitoring data so that the monitoring results can be reflected in environmental administration, and the continuation of efforts to make this possible has been agreed upon by both the Japanese side and Syrian side.

3-6 Recommendations

For the remaining period of the project

- The GCEA should secure a certain number of laboratory staff members with a background on chemical knowledge that is necessary for implementing monitoring, and should also continue to make efforts to increase the retention ratio of the staff members by making improvements, etc., in employment conditions.
- Staff members working at the DFEA laboratories should participate in the "Program for Quality Control of Laboratory Analysis." implemented by the Atomic Energy Commission (AEC) and strengthen their capabilities for quality of assurance/quality control (QA/QC).
- The GCEA should take immediate measures for putting the wastewater treatment facilities installed in the Damascus DFEA into operation.

Recommendations for the short term

- (1) Formulation of a plan relating to air analysis training: In the project, training relating to air quality monitoring was implemented at 3 DFEAs. In aiming towards achieving the project overall goal, it is necessary for the GCEA to implement training at the rest of the DFEAs.
- (2) Continuous contact with JICA: As follow-up after the end of the project, it is recommended that the GCEA reports on the status of the DFEA laboratories to the JICA Syria Office arbitrarily.
- (3) Continuous securing of operating budget for laboratories: The GCEA has made efforts to secure the necessary budget for running the laboratories up until now. It is necessary for the GCEA to continue with measures that are implemented at timings when budget implementation and budget request procedures are necessary.
- (4) Measures for improving technical capabilities: (1) Continuous implementation of operating budget for laboratories, (2) establishment of an assignment allowance for laboratory staff, (3) securing full-time staff for analysis work, and (4) implementation of appropriate and continuous maintenance of analytical equipment are requested of the GCEA.

Recommendations for the mid and long term

- (1) Clarification of operations that the GCEA and DFEAs are responsible for: In implementing monitoring, the role of the GCEA is to operate and manage all of the DFEA laboratories, coordinate between the DFEAs, and give technical advice to the DFEAs; the role of the DFEAs is to carry out measurement and analysis of data on-site. Since the division of roles between both of these organizations is not clear at the present moment, it is desired for the roles to be clarified through documentation and regulations in the future, so that further efficient monitoring can be continued.
- (2) Environmental policies: In establishing environmental policies at the levels of the local governments and the central government, including educational activities, environmental impact assessment (EIA), and inspections, it is desired for the GCEA to develop procedures for reflecting monitoring results.
- (3) Accreditation of laboratories by the AEC: It is desired for the DFEA laboratories to obtain laboratory accreditation by the AEC as well as ISO-17025 accreditation in the future, and the GCEA and DFEAs are requested to make efforts to make this possible.

3-7 Lessons Learned

(1) Importance of linkage with other projects in the environmental field

In this project, information is being exchanged with Japan Overseas Cooperation Volunteers and Senior Volunteers who are currently being dispatched to various regions in Syria for the field of environmental education, as well as with other technical projects currently being implemented in Syria, such as for popularization of agriculture using water-saving irrigation, development of sewage systems, development of a water resource information center, and formulation of

comprehensive metropolitan and urban designs. In addition, by collaborating with Egypt's Ministry of State for Environmental Affairs, which is the organization that is implementing the "Regional Environmental Management Improvement Project in the Arab Republic of Egypt" 19 people from the Syrian side went to Egypt to participate in a study tour, and 1 person is undergoing a 1-month training program on water quality analysis at the Ministry of State for Environmental Affairs in Egypt. Furthermore, this project also entails exchanging information with the "Municipal Administration Modernisation (MAM) Program," which is financially supported by the EU.

Through linking with other projects related to the environment, it is possible to avoid overlapping support, and further efficient and comprehensive activities can also be implemented.

(2) Importance of building smooth communication

In order to manage the project effectively and efficiently, the fact that building smooth communication based on sufficient understanding of the structures of related organizations is important was learned as a lesson from the following case examples.

- In implementing this project, a technical committee (T/C), consisting of a team of experts and relevant parties from the Syrian side, was established. Through a series of meetings held by this T/C, which includes the DFEA directors and the top officials of the GCEA, communication between the DFEAs and the GCEA at the management level was able to be strengthened.
- In addition, as there was understanding and support by the DFEA directors and the governor of the governorates towards environmental monitoring, as exemplified by the DFEAs lending vehicles for the period until sampling cars were able to be provided by the GCEA, the project progressed smoothly.
- The DFEA laboratory staff members were conscious of carrying out activities together with their co-workers and as a team. Thus, laboratory staff who participated in training shared the skills and knowledge that they acquired with their co-workers and new staff members who were not able to participate in the training.