

Indonesia

Ex-post Monitoring of Completed ODA Loan Project
“The Bepedal Regional Monitoring Capacity Development Project”

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Field Survey: August 2009

1. Project Description



Map of the project area



Equipment procured by this project

1.1 Project Objective

The objective of this project is to improve the capacity for collection and analysis of environmental data(water/air pollution, etc.), which forms the basis for the development of monitoring programs, by developing the capabilities of regional laboratories (research institutes), thereby contributing to improvements in Indonesia's environment through improving the efficiency of environmental administration.

1.2 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	2935 million yen / 2743 million yen
Loan Agreement Signing Date/ Final Disbursement Date	November 1994 / December 2001
Ex-post Evaluation	FY 2003
Executing Agency	Environmental Impact Management Agency (BAPEDAL) (at the time of appraisal)
Main Contract	Itochu Corporation (Japan)
Main Consultant	Nihon Suido Consultants (Japan)

1.3 Background of Ex-post Monitoring

As rapid population and economic growth accelerated environmental degradation in Indonesia, the establishment of a nation-wide network for environmental monitoring became an urgent task. At the time of appraisal (1994) however, there were few laboratories which owned the appropriate equipment for testing besides in Jakarta and, thus, environmental data was neither sufficient in quantity nor quality. In order to cope with this problem, this project provided regional laboratories with the equipment for environmental monitoring. The ex-post evaluation confirmed that the equipment was utilized to some extent but it also revealed that there had been no clear program for the utilization of the regional laboratories assisted by this project following the resignation of President Suharto in 1998. The laboratories were merely measuring and providing data in response to client requests. Decentralization altered the institutional arrangements for the operation and maintenance of this project. The ownership of the procured equipment was to be transferred to provincial governments while the location of the equipment was to be changed to provincial environmental departments. Because of this, at the time of the ex-post evaluation, careful monitoring was required as to how decentralization would affect the sustainability of the project effects. Therefore, this project was selected for ex-post monitoring and reviewed under each criterion with the findings from the field survey and other research activities with a final conclusion being drawn.

2. Monitoring Results

2.1 Effectiveness (Impact)

There was no significant change in effectiveness from the ex-post evaluation (2003) to the ex-post monitoring (2009). Among the laboratories with equipment procured by this project, the number of testing samples has stayed at the same level as at the ex-post evaluation and the number of laboratories accredited ISO17025 remains the same.¹ As equipment little used for testing tends not to be repaired after machine trouble, their use has become less frequent than at the time of the ex-post evaluation. Although the target laboratories play a similar role in the environmental monitoring, there are several new cases (the contribution to the reduction of pollutant, the enhancement of environmental monitoring capacity in Kota/Kabupaten governments, and the enforcement of environmental regulations) which contribute to realizing the desired project effects.

2.1.1 Quantitative Effects

¹ ISO17025 is for testing or calibration organizations and accredits a certain type of material testing or that of the calibration of meters.

(1) Usage of the procured equipment

Out of the laboratories with equipment procured by this project, 10 laboratories were visited during the field survey when interviews about the current status of equipment usage took place. For comparison with past data, the laboratories which were inspected in the ex-post evaluation were revisited. These were:

North Sumatra province: BLH (provincial government)

West Java province: BBPK (Ministry of Industry: MOI), BPLK (provincial government), BPMKL (provincial government)

East Java province: Baristand (MOI), BBTKL (Ministry of Health: MOH), BLH (provincial government)

South Kalimantan province: Baristand (MOI), BLK (provincial government), Dinas PU (provincial government)

*Ministries and local governments with which the laboratories are affiliated are in parentheses

Amongst the equipment for water quality monitoring, UV-VIS and Atomic Absorption Spectrophotometers (AAS) are widely used for water testing by private companies and local government and their use is very frequent (see Table 1 and Table 2). On the other hand, the uses of Gas Chromatography (GC) and Total Organic Carbon Meters (TOC) are less frequent than it was at the time of the ex-post evaluation. For most of the target laboratories, the main purpose of the equipment is to meet testing requests from clients. The small number of clients with testing needs results in the infrequent use of equipment. There are very few clients which require testing using TOC. Except for residual pesticide, testing with GC is also very limited.

Table 1 Use of procured equipment at the time of ex-post evaluation
(for the previous 6 months)

Equipment	N	Used	Not used	Unknown
UV-VIS	18	13	0	5
AAS	18	11	0	7
GC	15	11	1	3
TOC	18	11	2	5
Air pollution observation vehicle	10	1	4	5

Source: Data collected for the ex-post evaluation on
The Bepedal Regional Monitoring Capacity Development Project

**Table 2 Use of procured equipment at the time of the ex-post monitoring
(Used/Not Used for the previous 6 months)²**

Equipment	N	Used	Not used
UV-VIS	10	10	0
AAS	10	9	1
GC	7	2	5
TOC	10	4	6
Portable multi gas analyzer	4	3	1
Air pollution observation vehicle	4	1	3

Source : Interviews at the 10 laboratories visited during the field survey

Photo 1 UV-VIS



Photo 2 Atomic Absorption Spectrophotometer (AAS)



Photo 3 GC



Photo 4 Total Organic Carbon Meter (TOC)



² The ex-post evaluation report did not mention the use of portable multi gas analyzers. In consideration of its importance in air quality testing, the use of the equipment was assessed in this ex-post monitoring.

Among the equipment for air quality monitoring, the portable multi gas analyzers are used for the testing of smoke-stacks at factories and that of ambient air (see Table 1 and Table 2). The laboratories under MOI have clients who require the testing of smoke-stacks. The laboratories which indicated that they do not use the portable multi gas analyzer quoted malfunction as the reason of nonuse. As for Air pollution observation vehicles, out of four laboratories visited during the field survey, three laboratories had experienced problems at the time of procurement (the controlling PC could not be connected to meters, etc.). In the case that the vehicles were used, equipment was removed from the vehicle and used inside the laboratory.

Photo 5 Portable multi gas analyzer



Photo 6 Air pollution observation vehicle



(2) Number of Monitoring Samples

In order to obtain information on the usage of equipment, a questionnaire survey with the laboratories was carried out for the ex-post monitoring. Using the latest information, questionnaires were sent out to 39 laboratories in 14 provinces which own or received the procured equipment. Questionnaires were returned from 24 laboratories, 20 laboratories of which still owned the equipment at the time of the ex-post monitoring. 10 laboratories answered on the numbers for water testing, 6 laboratories on stack testing, and 4 laboratories on ambient air testing.

The change in the number of testing samples in comparison with data at the time of the ex-post evaluation is shown below (see Table 3). A majority of the laboratories replied that there was no change in the numbers for testing of water, stacks, or ambient air.

Table 3 Change in testing samples
(comparison with the time of the ex-post evaluation 2003)

	Increase	No Change	Decrease	Total
Water	3	5	2	10
Stacks	2	4	0	6
Ambient Air	1	3	0	4

Source: Questionnaire with target laboratories

(3) ISO 17025 accredited laboratories

According to the database of the Indonesian national standards organization Badan Standardisasi Nasional (BSN), among those with the procured equipment, 10 laboratories had ISO17025 in 2008. At the time of the ex-post evaluation, out of those with the equipment, 10 laboratories had ISO17025. After April 2009, MOE Regulation No.6 of 2009 requires accredited environmental laboratories (which are allowed to test data to be submitted to national and regional laboratories) to have ISO17025. Because of this new regulation, all of the 10 laboratories visited during the field survey had obtained or were applying for ISO17025. As the preparation of Standard Operational Procedures (SOP) is required for ISO17025 accreditation, most of the visited laboratories had SOP.

2.1.2 Qualitative Effects

(1) Factors affecting the use of equipment

Focus group discussions (FGD) were carried out at BBTKL³, which belongs to MOH, in order to obtain views on the factors that affect the effective use of equipment. Two FGD sessions were conducted: one for administration staff and another for testing staff. In the FGD, the most common reason given for the effective use of equipment among the administrative staff was that the equipment satisfied the needs of BBTKL (see Box 1). Similarly, testing staff were of the opinion that the procured equipment complemented the existing equipment and had a high utility, in addition to this, the improvement in testing skills contributed to the better use of equipment. Those who use the equipment perceived that not only capability in the use and maintenance of the equipment but also the assessment of equipment needs plays a vital role in the effective use of the equipment.

³ As BBTKL scored highly in the *Special Assistance for Project Sustainability for the Bapedal Regional Monitoring Capacity Development Project* funded by the Japan Bank for International Cooperation, and it was chosen as a laboratory which uses the equipment effectively.

Box 1: Focus Group Discussion (No.1)

Date: August 11, 2009

Location: BBTKL (affiliated with Ministry of Health), Surabaya, East Jawa province

Discussion Theme: “Why does BBTKL effectively utilize the equipment?”

Participants: BBTKL testing staff (11 participants) and administrative staff (8 participants)

After discussion, participants were asked to cast votes (up to three votes per person) on the reasons for why they agreed about effective equipment use. The results were as follows:

Testing staff	# of votes
Operators' competence is satisfactory due to training	10
New equipment complements existing equipment	8
Routine maintenance	5
Improvement of the accuracy of analysis results	3
Fast and simple methods for analysis	3
More testing parameters	2
Improvement of analysis methods	2

Administrative Staff	# of votes
Equipment fulfilled the needs of the laboratory	10
Laboratory is a accredited environmental laboratory	8
State of the art equipment	6

2.1.3 Impact

(1) Contribution to regional environmental monitoring systems

The target laboratories play a similar role in environmental monitoring as they did at the time of the ex-post evaluation. The laboratories test and provide samples upon request from clients (provincial governments, Kota/Kabupaten governments, and private companies). However, there are several new cases contributing to the realization of project effects other than testing for clients.

1) Efforts to reduce pollutant

FGD were carried out at BBPK, which belongs to MOI, in order to obtain views on the effectiveness of equipment use (see Box 2). Unlike other laboratories, BBPK also place an emphasis in independent research and the consulting services to companies. BBPK does not only test samples from clients but also contributes to the reduction of pollutants at client companies via research and consulting. The procured equipment is utilized for the research and consulting activities of BBPK.

Box 2: Focus Group Discussion (No.2)

Date: August 7, 2009

Location: BBPK (affiliated with the Ministry of Industry), Bandung, West Jawa province

Discussion Theme : “How does BBPK contribute to the protection of the environment?”

Participants : BBPK research staff (8 participants) and testing staff (10 participants)

Figures next to opinions are the number of participants’ votes. After discussion, participants were asked to cast votes (up to three votes per person) on the reasons for why they agreed about effective equipment use.

Research staff	# of votes	Testing staff	# of votes
More efficiency in waste processing (less pollutants)	6	Conducting analysis of various kinds of industrial waste	15
More recycling	6	Consultation with companies	6
Training for companies	4	Conducting research for environmental protection	5
Monitoring of waste	2	Training for companies	4
Design of the processing system for liquid waste	2		
Improvement of score in environmental assessment	2		
Dissemination of research results	2		

2) Review of environmental data from Kabupaten /Kota governments and training

Under the environmental monitoring scheme in Indonesia, Kota/Kabupaten governments inspect river water quality in their assigned areas. Meanwhile, provincial governments put together data from the Kota/Kabupaten governments and collect data in their assigned river sections. Among the laboratories visited during the field survey, the procured equipment was transferred to the laboratories under the provincial environmental departments in North Sumatra and East Jawa provinces. According to interviews at the laboratories, the provincial governments checked water quality data from the Kota/Kabupaten governments with the data being tested using the procured equipment. In North Sumatra province, the Kota/Kabupaten governments purchased new equipment with the support of the special national account for the environment (DAK) but the number of staff who can use this new equipment is limited. The laboratory under the provincial department of the environment provides training to the Kota/Kabupaten governments using the equipment procured by this

project.

3) Contribution to compliance with environmental regulations

For the 10 laboratories visited during the field survey, the department of environment in East Jawa province routinely conducts forced inspections jointly with the police. Samples taken from forced inspections are tested in laboratories near Surabaya, some of which are target laboratories. Based on results of tests, the closure of factories and the punishment of relevant persons may be executed. The procured equipment contributes to compliance with environmental regulations.

(2) Impact on the environment

Negative effects from the target laboratories on the surrounding environment were not observed during the field survey. In accordance with MOE Regulation No.6 of 2009, which has been effective since April 2009, an accredited environmental laboratory is required to obtain ISO17025. As the accreditation of ISO17025 demands the appropriate treatment of waste water, the laboratories visited are now dealing with this requirement.

2.2 Sustainability

After the ex-post evaluation, many of the target laboratories changed their affiliation from the Ministry of Public Works (MOPW) and MOH to provincial governments. While the relocation of equipment has been carried out in a handful of provinces, in other provinces equipment is still located at the laboratories where it was originally installed and these laboratories still have the right of use. As the Ministry of Environment (MOE) still has ownership of the equipment, some laboratories have inappropriate audit results that show allocation of O&M budget to equipment which is not included in their accounting. As technical aspects, the Environmental Impact Management Laboratories (formerly the Environmental Management Center, EMC) were providing training for the target laboratories at the time of the ex-post evaluation. At the time of the ex-post monitoring, the Environmental Impact Management Laboratories provided training to environmental departments. The target laboratories have training in various other institutions.

2.2.1 Operation and Maintenance Agency

2.2.1.1 Structural Aspects of Operation and Maintenance

Along with the progress of decentralization, many of the target laboratories changed their affiliation from MOPW and MOH to provincial governments. Out of 20 laboratories where the questionnaire survey confirmed that equipment still remains, the laboratories under MOI continue to be under the same ministry. However the laboratories under MOPW and some

of the laboratories under MOH are now under provincial governments (See Table 4).

Table 4 Affiliation of laboratories

Name of Laboratory (at the time of appraisal)	At the time of Ex-post Evaluation	At the time of Ex-post Monitoring
Public Works Laboratory, MOPW (PU)	MOPW, Provincial govt.	Provincial govt.
Industrial Research and Development Laboratory (BPPI)	MOI	MOI
Cellulose Research and Development Center, MOI (BBS)	MOI	MOI
Public Health Laboratory, MOH (BLK)	MOH, Provincial govt.	Provincial govt.
Environmental Health Laboratory (BTKL)	MOH	MOH

MOPW: Ministry of Public Works, MOI: Ministry of Industry, MOH: Ministry of Health

Source: Questionnaire survey with the laboratories, ex-post evaluation on the Bepedal Regional Monitoring Capacity Development Project

At the time the of ex-post evaluation, there was a policy to transfer the ownership of equipment to provincial governments and the location and the right of use equipment to provincial environmental departments. In North Sumatra and South Sumatra provinces, the equipment was relocated. At the time of the ex-post monitoring, MOE still had ownership and the relocation of equipment was confirmed in Lampung (see Table 5). The laboratories where equipment was originally installed still have the right of use. Even in cases where the location and right of use of equipment were changed, the ownership was not transferred. The transfer of ownership requires approval from the Ministry of Finance but this process is delayed.

At the laboratories where equipment is installed, interviewees explained the reason for non-relocation as follows: relocation would be the interruption in service to clients, provincial environmental departments do not have to own a laboratory as testing is possible at a number of laboratories. In West Jawa province, the provincial government decided not to move equipment from the laboratories where it was initially installed.

Table 5 Structure of O&M

	At the time of ex-post evaluation (2003)	At the time of ex-post monitoring (2009)
Ownership of equipment	To be transferred from MOE to provincial governments (the policy was informed provincial governments in December 2002)	The policy to transfer ownership is valid but MOE still has ownership due to a delay in the procedure.
Installation site	To be move to provincial environmental departments where relocation is possible. The equipment has been relocated in North Sumatra and South Sumatra provinces.	Equipment was moved in Lampung province as well as in North Sumatra and South Sumatra provinces. In other states, transfer is not confirmed.
Right of equipment use	The laboratories where equipment is installed have the right of use.	Ditto

Source: Interview at MOE, Questionnaire survey with the target laboratories

2.2.1.2 Technical Aspects of Operation and Maintenance

The Environmental Impact Management Facilities under MOE provided training to provincial departments of environment and regional laboratories, including the target laboratories, up to 2006 (after the ex-post evaluation). Out of 20 laboratories where the questionnaire survey confirmed that equipment still remained, 7 laboratories replied that they participated in training at EMC. At the time of the ex-post monitoring, the Environmental Impact Management Facilities still conducted training for environmental departments in local governments. The target laboratories had training in various other institutions. Among the laboratories visited, many had the training for equipment use at the Indonesian Institute of Sciences (LIPI) and training for laboratory management at private consulting firms which provide services to assist in ISO-accreditation.

Out of 20 laboratories where the questionnaire survey confirmed that equipment still remained, 15 laboratories replied that spare parts for equipment are still available but are difficult to obtain. Interviews at the laboratories visited revealed that the laboratories requested repairs via suppliers who carry measuring instruments and that response was not smooth except in Jakarta, Surabaya, and the outskirts of these cities. It takes several months to one year to obtain spare parts, occasionally out of Indonesia, even if a repair service is available.

2.2.1.3 Financial Aspects of Operation and Maintenance

A majority of the 10 laboratories visited during the field visit are allocated an operational budget from ministries and provinces.⁴ In these laboratories, service fees from clients must contribute to the revenue of ministries and provinces and the appropriation of revenue to O&M is not allowed. The laboratories which currently use the procured equipment take expenses for the O&M of the equipment. As MOE has the ownership of equipment, some laboratories have inappropriate audit results allocating O&M budget to equipment which is not included in their accounting books.

The asset life of the procured equipment is approximately 5 years. The equipment can be retired after this period is over. The retirement of equipment needs to follow procedures set by the Ministry of Finance. In general, however, the retirement of equipment is very rare because of these cumbersome procedures.

2.2.2 Current Status of Operation and Maintenance

For the 10 laboratories visited during the field survey, the main purpose of the equipment is to meet clients' requests for testing. Equipment little used for testing, such as GC and TOC, are more likely to remain unrepaired after machine troubles.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

In view of the number of testing samples and the number of laboratories accredited ISO17025, it can be concluded that there has been no significant change in effectiveness. For the effective use of equipment, not only the capacity of laboratories but also assessment of needs is an important factor. The role of the target laboratories remains to test samples upon the request of clients as it was at the time of the ex-post evaluation. As for sustainability, the policy was to transfer the ownership of the procured equipment from MOE to provincial governments. However, MOE still retains ownership due to the slow progress of transfer. Furthermore, some laboratories have inappropriate audit results that allocate O&M budget to equipment which they do not own.

3.2 Lessons Learned

(1) Needs assessment by the executing agency

The main purpose of equipment use is to meet requests for testing from clients. As

⁴Only the Dinas PU laboratory in South Kalimantan is on a self-supporting basis.

equipment little in demand for testing is likely to remain unrepaired, the needs assessment of equipment affects sustainability. At the time of the ex-post monitoring, testing demand for UV-VIS, AAS, and portable multi gas analyzers is strong. On the other hand, that for TOC and GC is weak. The type of equipment is determined by the affiliation of laboratories as the number of target laboratories is too high for them to be assessed one by one. However, laboratories under the same ministry have different types of clientele and face various testing demands. Equipment little in demand for testing was procured as a result of this. In cases where dispersed project sites do not allow needs assessment, it is desirable that advantage is taken of finance schemes, such as sector loans, in which the executing agency conducts needs assessment and flexibly changes the scope of project, on condition that the implementation capacity of the executing agency can be assured.

3.3 Recommendations

(1) Ownership and right of use of the equipment (for MOE)

Since the ownership and the right of use do not match for the procured equipment, allocating O&M budget to the equipment can be misappropriated in the strict sense. This situation may prevent appropriate O&M. The transfer of ownership is unlikely to be completed in the near future and, therefore, it is recommended that budget allocation is allowed for the O&M of equipment with proof of the right of use.

(2) Retirement of obsolete equipment (for MOE)

After a decade since procurement, aging, wear and tear, and the unavailability⁵ of spare parts has disabled some of the equipment. Equipment which has passed its asset life and which is difficult to be repaired is still on the accounting books and is not yet retired. In order to accelerate the renewal of equipment, it is recommended that this equipment is disposed of, following proper accounting procedures.

⁵ Laboratories pointed out some reasons, one of which is that suppliers' inadequate response requires the procurement outside of Indonesia.

Comparison of Original and Actual Scope

Item	Original	Actual
Project Output:		
Provision of water quality monitoring equipment	39 laboratories in 14 provinces	As planned
Provision of air quality/noise monitoring equipment	26 laboratories in 14 provinces	As planned
Provision of mobile laboratories	15 laboratories in 15 provinces	As planned
Consulting services	Foreign : 92 M/M Indonesian : 134 M/M	Foreign : 110 M/M Indonesian : 190 M/M
Project Period:		
Consultant selection	June 1995	November 1995
Tender / Contract	December 1996	November 1999
Procurement / Installation	November 1997	October 2000
Maintenance phase	December 1998	November 2001
Project Cost:		
Foreign currency	2,935 million yen	2,349 million yen
Local currency	401 million yen (8,035million rupiah)	394 million yen (17,440 million rupiah)
Total	3,336 million yen	2,743 million yen
ODA loan portion	2,935 million yen	2743 million yen
Exchange rate	1IDR = 0.05 yen (as of November 1994)	1IDR = 0.226 yen (Average between September 1996 and June 2001)