Terminal Evaluation

Asia

1. Outline of the Project

- Country: Indonesia
- Project title: The Project for Establishment and Management of Appropriate Technology Center for Waste Water Treatment in Indonesia
- Issue/Sector: Environment
- Cooperation scheme: JICA Partnership Program
- Section in charge: Regional Dept. I
- Total cost: approx. 156 million yen
- Period of Cooperation: 1 October 2001 to 30 September 2004
- Partner Country's Related Organization: Yayasan Dian Desa (YDD)
- Supporting Organization in Japan: Asian People's Exchange (APEX)
- Related Cooperation

1-1 Background of the Project

Rapid economic growth from the late 1960s to the middle of 1990s in Indonesia was accompanied by industrialization and urbanization of the country, which has brought about difficult problems of water pollution. In spite of the government's effort to solve the problems, the situation related to the pollution is even worsening. In order to relieve the problems, it is essentially important to facilitate waste water treatment process at the point of discharge, but the existing technologies for the treatment are too costly and often require special knowledge and experience for the proper operation. Therefore, though a limited number of large enterprises is ready to invest in facilities for waste water treatment, it is very difficult for small and medium ones to introduce them. This project existed to introduce and develop appropriate technology of waste water treatment in five kinds of industries that have specific wastes, to be the entry point of adopting the technology to more industries in Indonesia.

1-2 Project Overview

This was the first project of JPP in Indonesia, and located in Yogyakarta. The project consisted of five main activities, e.g., establishment of Appropriate Technology Center for Waste Water Treatment, Pilot Plants, Human Resources Development, Information Center and Services, and Networking

(1) Overall Goal

Technologies developed by Apporopriate Technology Center for Waste Water Treatment are adopted

(2) Project Purpose

Waste water treatment technologies appropriate for small and medium scale industries (including hotel and hospital) in Indonesia are developed, and their dissemination system is established in Appropriate Technology Center for Waste Water Treatment

(3) Outputs

1) Appropriate Technology Center for Waste Water Treatment is established in Yogyakarta

2) Appropriate technologies proved by pilot plants for respective industries are developed

3) Capabilities of personnel who are responsible for promoting and implementing waste water treatment are improved

4) Information for waste water treatment appropriate technology has been accumulated and information service for technology is provided

5) Network of the people concerned with waste water treatment is formed

(4) Inputs (as of the Project's termination)

Japanese side:
Human Resource

Project Manager	24 M/M
Coordinator	30 M/M
Facilitator (Training & Seminar)	5 M/M
Specialist	as required

Facilities

Appropriate Technology Center for Waste Water Treatment	500 m^2

Equipment

Pilot Plants (8 units), Water Analysis Equipment, Office Equipment, Training Equipment, Automobile

Indonesian Side:
Human Resource

Director	36 M/M
Manager (R&D Section)	36 M/M
Manager (Training Section)	36 M/M
Assistant	8 people
Specialist	as required

2. Evaluation Team

Members of Evaluation Team
(JICA Indonesia Office contracted out the evaluation to the following consultant)
Member of Evaluation Team: Andi Rohman Kurniadi, Fiyanti Osman
Period of evaluation
17 June 2004 - 19 July 2004
Type of Evaluation:
Terminal Evaluation by Overseas Office

3. Results of Evaluation

3-1 Summary of Evaluation Results

(1) Relevance

Project benefits were addressed to target groups. Since the target groups of this project were industries as the direct user of waste water treatment technology, so project's effort to introduce and show them the appropriate technology as an alternative to solve their waste problems was relevant. Some industries (especially those that pilot plant available) have adopted this technology, and the local community surrounding the industries have not complained anymore. It showed that the project purpose reflect the need of local communities.

This was also relevant to the Indonesian development policy, especially some regulations on obligation for industry to take water

treatment, or to the manufacturer to avoid and handle water pollution, and also regulation on quality standard of industrial waste including hotel and hospital. This technology could encourage the industries to be responsible to treat their waste water properly, and keep the environment clean and healthy.

(2) Effectiveness

Project approach was effective in developing the technology of waste water treatment in five kinds of industries. From the technology itself, it has proved the effectiveness of modified technology in reducing pollutant's content toward achieving the quality standard of waste water recommended (or even lower than that value). This technology has been fully adopted by those user industries, but for another industries were only part of technology due to limited fund available. The successful of pilot plant in five kind of industries have encouraged other people including companies, universities, government to know further about the more detail of technology which was indicated by the letter of inquiries received by Pusteklim. Most of inquiries was about the request for designing the installation of waste water treatment.

(3) Efficiency

Project was efficient that indicated by the following facts:

Pusteklim could modify the technology of waste water treatment from Japan to the one that suitable for Indonesian condition, with lower investment cost.
Pusteklim have well managed the inputs, so the outputs have been achieved on time
Pusteklim have transferred knowledge on waste water treatment technology to many people who concern with waste problems and healthy environment (154 participants of training and 107 participants of seminar)

(4) Impact

Technology of waste water treatment developed by Pusteklim has given positive impact on reducing the pollutant's content in industrial waste water, until it reaches the value of waste water quality standard (or even lower than it) recommended by local government. In other side, human resources program held by Pusteklim have also given new spirit for those who have problems related to waste water, and made them know now where to go and to whom they ask to get solution for their problems.

However, the technology to solve the waste water problem in industries initiated by Pusteklim might give negative effect to industries (decreasing their motivation) if the government still could not take the fair and plain action to give punishment to those who ignored the regulation of waste water treatment, and give the reward to those who obeyed it. This project gave effects to the economy, but only in the form of saving the expenses for electricity not the profit because waste water investement was the cost center. While for the institution or organization, this project has made them more aware and improve their knowledge about the waste water technology.

Factors that influenced the purpose project achievement were: a) Project duration, b) Awareness to the environment, c) Fund available, d) Government's role in supervising the regulation by industries, e) Appropriate technology, f) Staff capability, g) Relevant regulation on waste water availability, h) Opportunity to get fund supporting from government.

(5) Sustainability

Project benefits that have been perceived by many parties, such as companies, universities, governments, and NGOs in relation to the existing of Pusteklim and its appropriate technology could sustained if Pusteklim itself could manage and maintain its resources better. However, these efforts were not enough to achieve sustainability because it was influenced by some major factors, such as fund, promotion, perception, awareness, commitment, networking, and law enforcement.

3-2 Factors promoting sustainability and impact

(1) Factors concerning to Planning

Implementing organizations in both Japanese and Indonesian sides had had experience in developing appropriate technologies prior to this project.

(2) Factors concerning to the Implementation Process

Project stakeholders on the Japanese side had sufficient capabilities to communicate in the local language.

3-3 Factors inhibiting sustainability and impact

(1) Factors concerning to Planning

N/A

(2) Factors concerning to the Implementation Process

The change of the Japanese project stakeholders in the midst of the fiscal year caused information disruption.

3-4 Conclusions

Project implementation has been running well. All project outputs can support the achievement of project purpose. Project purpose could be achieved on time, in terms of developing the appropriate technology by five kinds of industry such as food processing, leather industry/tannery, dye works, hospital and hotel), and adopting the technologies by other industries (in addition to pilot plants). While for the dissemination system of this technology, it has been established in the form of consultation on how to design and built the installation of waste water technology. The organization who need this consultation was varied, such as hospitals, hotel, industries (batik & nata decoco processing industry), shopping center, restaurant and educational institution.

The main achievements of this project were:

- Appropriate technology for waste water treatment using combination process between anaerob and aerob that save energy consumption, and reducing the pollutant's content particularly BOD and COD
- Technology has applied RBC (two kind ; RBC "ijuk" and RBC three dimension lattice) for aerob process, and applied UASB, Anaerobic Filter, and Baffle Septic Tank for anaerob process, that using local resources (especially RBC ijuk), and applicable for limited space (especially UASB).
- Pusteklim has been acknowledged as the institution that can give solution for waste water problem for industries, including hospital and hotel

3-5 Recommendations

- Pusteklim should be paid more attention to improve and complete their administration system, since the data, and all informations produced become more important in the future and can be available when it is needed.
- Coordination with governments should be done more intensive in order to get good will to support the developing of waste water treatment technology.
- Collaboration with private companies and universities
- Promoting the success technology with more attractive and innovative strategies such as regular workshop, direct presentation to industries, communication/consultation networking in social marketing, and public campaign.

3-6 Lessons Learned

- This kind of collaboration project between NGO Japan and NGO Indonesia was very useful not only in technical aspect such as developing appropriate technology of waste water treatment, but there was another benefits for both parties such as teaching and learning process, sharing experiences, increasing access to the industries in both countries, and extend the networking in waste treatment technology.
- This project has empowerment process in transferring the technology and knowledge of industrial waste water treatment. Another empowerment process that also important to be considered in the future program was the sense of belonging to the technology by the user that finally could affect the sustainability of it. This can be encouraged by applying the revolving fund mechanism with the principle of polluter's pay that the cost should be paid by those who use the waste water treatment technology.
- In developing waste water treatment technology, there was some important issues have to taken into consideration: a) Synergic national policy in related fields, b) Law enforcement by the government, c) Awareness of skillful operator, d) Integrated technology for waste water and domestic waste.

3-7 Follow-up Situation

N/A