

Name of Project: Ninh Binh Solid Waste Management & Treatment Project

Loan Agreement No.: VNM-006-2004

August 31, 2004

Country: Vietnam

The Export-Import Bank of Korea

(Government Agency for EDCF)

EDCF Operations Evaluation Team

(Evaluated by Hallym University and ESDI)

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EXECUTIVE SUMMARY

1. Basic Data

Loan Information

Loan Agreement No.	Loan Type	Approved Amount	Approval Date
VNM-006-2004	Development Project Loan	USD 19.6 million	August 31, 2004

Project Cost

Component	Budget	Expenditure	Difference
Total Cost	USD 26,300,000	USD 43,656,000	Δ USD 17,356
EDCF Loan	USD 20,970,000	USD 20,965,000	USD 5,000

2. Project Design and Implementation

2.1 Project purpose

Improve the regional environment by building a system of comprehensive solid waste treatment (i.e. collection, transportation and disposal) in Ninh Binh Province.

2.2 Project area

Tam Diep Town Thung Lang-Quen Kho region in Ninh Binh, 90km south of Hanoi, the capital city of Vietnam.

2.3 Project scope

- Improvement of waste collection/transportation system
- Purchase of 43 waste collection/compression vehicles, 6 sludge suction tankers, etc.
- Establishment of a compost production plant: Treatment of 200-ton solid waste and 40-ton sludge input per day
- Development of a new sanitary waste landfill usable for 20 years (landfill capacity: 225,000m²)

2.4. Project implementation structure

- Borrower: Vietnam's Ministry of Finance
- Executing organization: People's Committee of Ninh Binh Province
- Executing agency: Ninh Binh Solid Waste Treatment and Management Project PMU

2.5 Reasons for support

- Economic Development Cooperation Fund (EDCF)'s priority support project
- Consistency with Vietnam's environmental policy
- Necessity of the relevant project

2.6 Necessary costs, procurement and execution

The total project cost was USD 43,656 thousand, including USD 20,965 thousand of EDCF support for direct construction cost and consulting fees.

2.7. Consultant

Consultants were hired for the technical support purposes such as basic design, detailed design, and construction supervision. The consultant employment contracts and the procurement contract were delayed for 2 years and 4 months from the initial plan.

2.8. Purchase and construction

Hyosung Ebara Co., Ltd. was appointed to provide equipment and services on foreign currency spending. Equipment and services on local currency spending were supplied by companies in Vietnam only.

2.9. Output

- Establishment of a solid waste composting facility: Treatment of 200-ton solid waste and 40-ton sludge input per day
- Development of a sanitary landfill: landfill capacity of 225,000m²
- Improvement of waste collection/transportation system: 30 vehicles purchased, including units for waste collection, compression, and loading and cleaning vehicles

3. Overall Assessment

Evaluated as a "successful" (2.75/4.00 points) project

Criteria	Weight	Evaluation item	Evaluation	Score
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Relevance	25%	<ul style="list-style-type: none"> - Consistency with Vietnam's environmental policy and waste disposal policy - Consistency with EDCF's support strategy - Appropriateness of the project plan - Active participation of the recipient government, such as additional financing and civil complaint resolution in the project implementation procedures 	Relevant	3.0
Efficiency	25%	<ul style="list-style-type: none"> - Efficiency in the project implementation period - Efficiency in the project disbursement 	Partially efficient	2.0
Effectiveness	25%	<ul style="list-style-type: none"> - Output achievement status - Short-term goal achievement status - Mid- to long-term goal achievement status 	Effective	4.0
Sustainability	25%	<ul style="list-style-type: none"> - Institutional sustainability - Technological and personnel sustainability - Financial sustainability - Capability to respond to environmental problems 	Sustainable	3.0
Overall assessment			Successful	3.00

I. INTRODUCTION

1. Basic Data

Loan Information

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Key Dates

Item	Plan	Result
Audit Visit	Jul. 2004	Jul. 2004
Decision of Support Policy	Aug. 2004	Aug. 2004
Signing of Loan Agreement	Oct. 2004	Oct. 2004
Effective Date of Loan Agreement (A)	Jan. 2005	Jan. 2005
Signing of Consultant Contract	Oct. 2006	Oct. 2006
Signing of Purchase Contract	Jun. 2007	Oct. 2009
Project Completion (B)	Jun. 2008	Jun. 2014
Final Payment Date	-	Sep. 2015
Project Period (A through B)	42 months	114 months

Borrower: Vietnam's Ministry of Finance

Executing Agency: People's Committee of Ninh Binh Province

Execution Date

Type of Mission	Visit Schedule	Remarks
Audit	Jul. 2004	
Project Completion	Jun. 20, 2014	Completion Ceremony

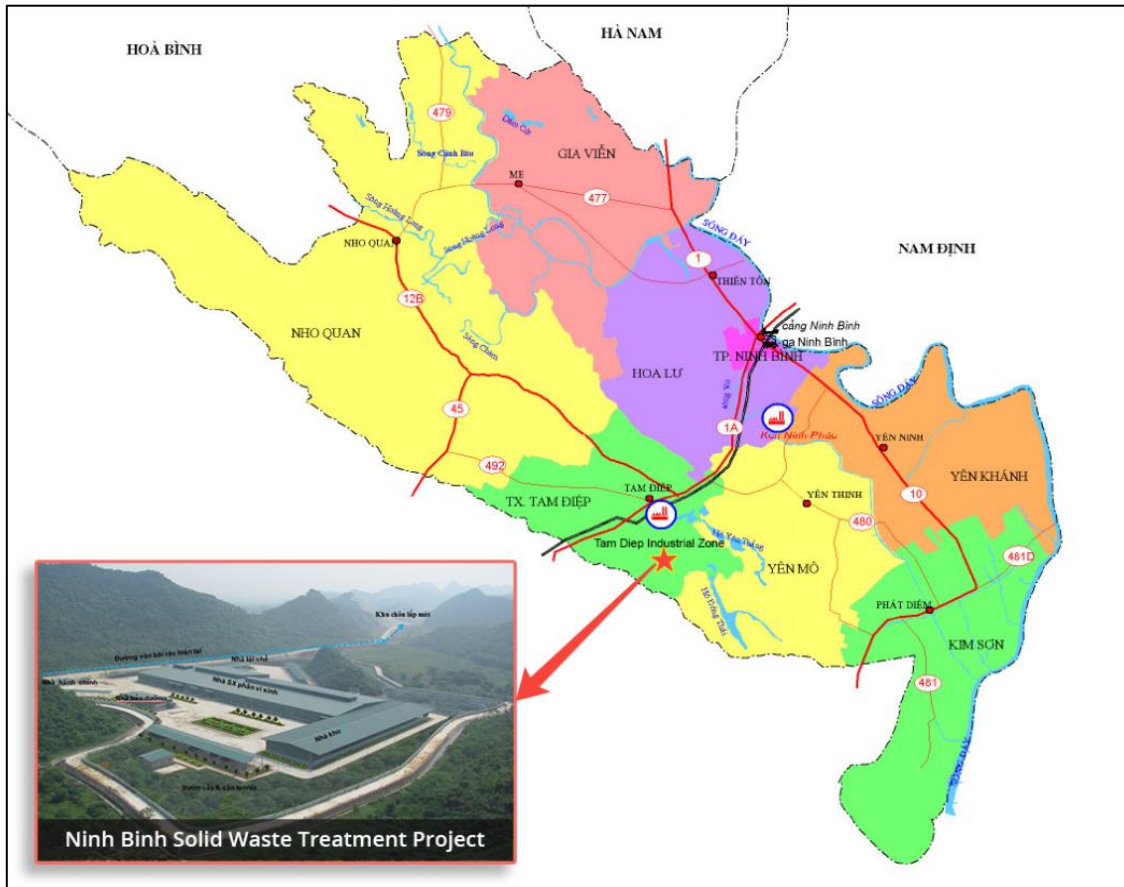
Ex-post Management	May 25, 2015	On-site Inspection
1st Ex-post Evaluation	Jun. 24 through 30, 2018	On-site Visit (project status and operating status checks)
2nd Ex-post Evaluation	Oct. 15 through 17, 2018	On-site Visit (for sharing evaluation results and discussing the future development plan)

2. Map(s) Related

- Map of the relevant country



Map of the project site



Source: Google Maps

3. Overview of Evaluation and Process

3.1 Evaluation objectives

Ex-post evaluation was conducted to inspect the performance indicators and analyze the success/failure factors of the project on the basis of the relevancy, efficiency, effectiveness, and sustainability of the Ninh Binh solid waste treatment project. Based on such inspection and analysis, it intends to induce the concrete and practical suggestions and lessons applicable to similar project design in the future.

3.2 Ex-post evaluation team

Title	Organization	Name	Detailed Duties
Leader	Hallym University	Dr. Seung Do Kim	<ul style="list-style-type: none"> Project Manager Make final decision and determination of reports, including evaluation results

Specialist	ESDI	Mr. Sog Kyom Kim	<ul style="list-style-type: none"> · Generally manage ex-post evaluation
Assistant	Hallym University	Mr. Ji Jae Lim	<ul style="list-style-type: none"> · Analyze information and set-up the detailed evaluation plan. · Plan and implement on-site investigation
Assistant	ESDI	Ms. Jung Min Shim	<ul style="list-style-type: none"> · Analyze information and set-up the detailed evaluation plan. · Plan and implement on-site investigation
Assistant	ESDI	Ms. Jae Jin Lee	<ul style="list-style-type: none"> · Analyze information and set-up the detailed evaluation plan. · Plan and implement on-site investigation
Local consultant	-	Ms. Truong Thanh Huyen	<ul style="list-style-type: none"> · Make communication channels · Support on-site investigation (e.g. interpretation and schedule coordination)

3.3 Evaluation process

Item	Schedule	Activity
Advance information survey	Apr. through Jun., 2018	Related literature survey and analysis
Notification of ex-post evaluation plan and schedule	Jun. 1, 2018	Notification of ex-post evaluation plan and schedule of a visit to Vietnam's Ministry of Finance and People's Committee of Ninh Binh Province
Sending of an evaluation questionnaire	Jun. 12 through 19, 2018	Sending of an evaluation questionnaire to the Government and project implementation organizations.
1st on-site investigation	Jun. 24 through 30, 2018	<p>On-site visit of and interview with related organizations</p> <ul style="list-style-type: none"> -Visit and interview Vietnam's Ministry of Finance and KEXIM Hanoi office -Interview the People's Committee of Ninh Binh Province (i.e. project implementation

		organization) and visit on-site facilities. -Visit and interview Vietnam's Ministry of Construction
Interim report preparation	Jun. through Jul., 2018	Review and analysis based on literature survey, interview with relevant persons, and 1st on-site investigation results
2nd on-site investigation	Oct. 15 through 17, 2018	Joint evaluation workshop and collection of supplementary data.
Submission of final report	Jan. 2019	Finalizing of evaluation results and submission of the final report with correction.

4. Expected Results

Item	Targets & Indicators	Source	Assumptions & Risks
<p><u>Impact</u> <u>(Mid- to long-term results)</u></p> <ul style="list-style-type: none"> Urban sanitation and environmental pollution prevention by constructing the landfill/ recycling facility. 	<p>Residents' satisfaction by improving local environment</p> <ul style="list-style-type: none"> - Achievement of more than 80% 	<p>Vietnam's Ministry of Natural Resources and Environment, General Statistics Office, People's Committee of Ninh Binh Province, and resident satisfaction survey</p>	<ul style="list-style-type: none"> Assumptions <ul style="list-style-type: none"> - Secured management and supervision of government waste treatment facilities. Risks <ul style="list-style-type: none"> - Environmental pollution caused by improper management of facilities.
<p><u>Outcome</u> <u>(Short-term results)</u></p> <ul style="list-style-type: none"> Improvement of solid waste collection rate and compost yield 	<ul style="list-style-type: none"> Improvement of a waste collection rate of the Project-affected region - Achievement of more than 90% Improvement of organic waste 	<p>Vietnam's Ministry of Natural Resources and Environment, General Statistics Office and People's Committee of Ninh Binh</p>	<ul style="list-style-type: none"> Assumptions <ul style="list-style-type: none"> - Stabilization of waste treatment system by raising citizens' awareness - Securing of personnel and technology for environment

	composting yield: 10-15 tons/day	Province	<p>facility operation.</p> <ul style="list-style-type: none"> - Separation and discharge of waste <p>· Risks</p> <ul style="list-style-type: none"> - Delayed implementation of waste separation and collection system, and reduction of collection amount of organic waste - Reduced financial support for facilities and equipment operating resources.
<p style="text-align: center;"><u>Outputs</u></p> <ul style="list-style-type: none"> · Construction of sanitary landfill and composting facilities · Supply of waste transportation equipment and landfill equipment 	<ul style="list-style-type: none"> · Ninh Binh Province's sanitary landfill - Sanitary landfill area: 3.3ha - Landfill capacity: 225,000m³ · Daily treatment capacity of composting facilities - Daily treatment capacity of landfill waste: 200 ton - Daily treatment capacity of sludge: 40 ton 	Project Completion Report	<ul style="list-style-type: none"> · Assumptions - Proper construction and procurement management <p>· Risks</p> <ul style="list-style-type: none"> - Delays in construction; and unit price rise due to plan change, a delay of consulting and purchase contracts, and exchange rate rise.
	<ul style="list-style-type: none"> · Supply of waste collection and transportation equipment and landfill equipment - Waste collection and transportation equipment and 		

	Compressing vehicle: 30ea		
<u>Activities with Milestones</u>			
<ul style="list-style-type: none"> · Consultant Selection: Within 18 months from the effective date of the loan contract · Purchase Contract: Within 18 months from the effective date of the loan contract · Completion of Construction: Within 36 months from the contract 			
<u>Inputs</u>			
<ul style="list-style-type: none"> · Total project expenses: USD 26,300,000 · EDCF: USD 20,970,000 · Vietnamese Government: USD 5,330,000 			

II. PROJECT DESIGN AND IMPLEMENTATION

1. Project Formulation

1.1 Project purpose

The purpose of this project was to improve the regional environment by establishing an comprehensive, integrated system of solid waste treatment—collection, transportation and disposal—in Ninh Binh Province, reducing diverse environmental pollutions (e.g. water and air quality) caused by the conventional landfill method, improving the living standards of local people, and contributing to enhanced community health and sanitation.

1.2 Project area

The project area is the Tam Diep Town Thung Lang-Quen Kho region in Ninh Binh Province, 90 km south of Hanoi, the capital city of Vietnam and the landfill is located in the neighboring valley area.

1.3 Project scope

In August 2004, the project scope was establishment of a compost production facility (200 ton/day) and a sanitary waste landfill establishment and improvement of a waste collection/transportation/disposal system.

Facility type	At the time of appraisal (August 2004)	Changed (March 2012)
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Sanitary landfill	Landfill area	6ha	3.3ha
	Landfill capacity	225,000m ³	-
Composting facility	Daily treatment capacity	Waste: 200 ton Sludge: 40 ton	-
Waste collection/transportation system	Collection/compression vehicle	43 vehicles	-

1.4 Project implementation structure

The Borrower is the Ministry of Finance of Vietnam and the executing organization is the People's Committee of Ninh Binh Province. The executing agency was initially Tam Diep Urban Environmental Corporation of Ninh Binh (TD URENCO) and then changed to Tam Diep PC's Ninh Binh Solid Waste Treatment and Management Project PMU consisting of specialists from relevant governmental departments.

2. Rationale for Support

- Consistency with EDCF's environmental support strategy
- Rising necessity of the project
- Consistency with Vietnam's environmental policy

3. Cost, Financing and Executing Process

3.1 Initial financing plan

The total project cost was USD 43,656 thousand in excess of the budget borne by the Vietnamese government. The direct construction cost and consulting fees supported by EDCF stayed within the initial range of USD 20,970 thousand. However, reserved funds were utilized for additional expenses for inspection personnel due to project delay and the change of equipment purchase items to heavy machines necessary for landfill maintenance.

3.2 Reason for change

The land purchase expenses, resident migration compensation expenses, etc. borne by the Vietnamese government largely increased because of landfill location change and project delay.

4. Consultants

Initially, the borrower government planned to proceed with the project in a turn-key manner. However, considering the lack of composting facility construction experience in Vietnam,

the borrower government, during the appraisal, suggested hiring Korean consultants separately for a successful project performance. The project executing organization employed consultants for the purpose of offering technology support such as bidding preparation, bidding guidelines, basic design, detailed design, and construction supervision.

5. Procurement and Construction

Hyosung Ebara Co., Ltd. was appointed to provide equipment and services on foreign currency spending. Equipment and services on local currency spending were supplied by companies in Vietnam only. The project executing organization decided that the bulldozers, sludge suction tankers, etc. were producible within the country among items listed in the final statement of equipment and machinery and were not allowed to be purchased from a third country.

For the part of EDCF loans, purchase plans were established in the manner of limited competitive bidding among Korean firms or direct contracting.

The consultant contract and the construction contract were separately pursued. This construction contract was concluded on a turn-key basis.

6. Outputs

The project was completed in June 2014. The installation of sanitary landfill, composting facility, leachate treatment facility, and waste collection/transportation system were completed.

Facility	Plan (A)	Result (B)	Difference (A-B)
Composting facility	200 ton/day	200 ton/day	-
Landfill facility	3.3ha	3.3ha	-
Collection and transportation vehicle	43 vehicles	30 vehicles	Δ13 vehicles

7. Loan Covenants

7.1 Conclusion and effective date

- Execution date of the loan contract: October 2004
- Effective date of the loan contract: January 2005

7.2 Disbursements

- Final fund disbursement date: September 17, 2015 (114 months delayed from the plan)
- Loan disbursement method: Letter of Credit (commitment procedure) or direct payment procedure

7.3 Loan terms

- Interest rate of 2.0% per annum and a total 30-year principal repayment period including a 10-year grace period

III. ASSESSMENT FOR EACH EVALUATION CRITERION

1. Overall Assessment

With the same weight of 4 evaluation criteria, the project evaluation result was “**successful (2.75/4.00 points)**”.

Criteria	Weight	Evaluation item	Evaluation	Score
Relevance	25%	<ul style="list-style-type: none"> - Consistency with Vietnam’s environmental policy and waste disposal policy - Consistency with EDCF’s support strategy - Appropriateness of the project plan - Active participation of the recipient government, such as additional financing and civil complaint resolution in the project implementation procedures 	Relevant	3.0
Efficiency	25%	<ul style="list-style-type: none"> - Efficiency in the project implementation period - Efficiency in the project disbursement 	Partially efficient	2.0
Effectiveness	25%	<ul style="list-style-type: none"> - Output achievement status - Short-term goal achievement status - Mid- to long-term goal achievement status 	Effective	4.0
Sustainability	25%	<ul style="list-style-type: none"> - Institutional sustainability - Technological and personnel sustainability - Financial sustainability - Capability to respond to environmental problems 	Sustainable	3.0
Overall assessment			Successful	3.00

2. Relevance

The project contributed to the firm establishment of policies on waste disposal projects in line with Vietnam’s environmental policy. Its goals were properly established. The project was highly consistent with EDCF’s support priority and aid strategy. However, it failed to properly reflect in the project plan the separate collection program being delayed from the plan, the incineration-oriented, changed environmental policy, and the local technological level and operational situation. Overall, the project is evaluated as **“relevant (3.0 points)”**.

Criteria	Weight	Evaluation item	Score
Relevance	25%	• Consistency with Vietnam’s environmental policy and waste disposal policy	3.0
		• Consistency with EDCF’s support strategy	4.0
		• Relevance of the project plan	1.0
		• Active participation of the recipient government, such as additional financing and civil complaint resolution in the project implementation procedures	4.0
		Total score	3.0

3. Efficiency

The project was completed after a delay of 9 years and 6 months as construction commencement was delayed by migrating residents in the project site and the landfill location changed due to the socio-economic development plan of Ninh Binh Province. Such delay and landfill relocation caused excessive expenditure of the Vietnamese government to make the total cost of USD 43,656 thousand. Whereas the direct construction cost and consulting fee supported by EDCF stayed within USD 20,965 thousand as initially planned, recording an efficient level of 99.9%. Overall, the project is evaluated **“partially efficient (2 points)”**.

Criteria	Weight	Evaluation item	Score
Efficiency	25%	• Efficiency in the project implementation period	0
		• Efficiency in the project disbursement	4
		Total score	2

4. Effectiveness

Sanitary waste landfill capacity and composting facility capacity were attained as stated in

the project plan. Initially, 43 vehicles for waste collection and transportation were planned but the number was changed to 30 at the point of project completion. Still, it is consistent with improvement of collection and transportation as the equipment necessary for landfill maintenance was purchased. As for the short-term goal, the composting facility capacity stands at 14% of the designed capacity and the efficiency of the leachate treatment facility is unsatisfactory. With respect to the mid- to long-term achievement, the environmental improvement effect and recipients' satisfaction achieved 90% of the targeted level according to the survey. Generally, the project is evaluated as **“effective (4.0 points)”**.

Criteria	Weight	Evaluation item	Score
Effectiveness	25%	• Output achievement status	4.0
		• Short-term goal achievement status	2.0
		• Mid- to long-term goal achievement status	4.0
		Total score	4.0

5. Sustainability

When it comes to sustainability, there are some insufficient considerations on the recipient country's waste separate collection policy as to the productivity of composting facility operation and how to preemptively respond to meeting the lawful water quality standards. Still, sustained improvements are expected in the future based on the recipient government's environmental policy. Institutional and financial sustainability are at a sustainable level whereas technological and personnel sustainability and responsiveness against environmental problems are inadequate. Overall, the project is evaluated **“sustainable (3 points)”**.

Criteria	Weight	Evaluation item	Score
Sustainability	25%	• Institutional sustainability	3.0
		• Technological and personnel sustainability	2.0
		• Financial sustainability	4.0
		• Capability to respond to environmental problems	1.0
		Total score	3.0

6. Other Assessment

6.1 Consideration of gender and vulnerable social groups

There is no particular gender discriminatory element in the operation personnel employment process. The relevant facilities make no big issues and are less preferred and unwelcomed by

job seekers. However, improving the working environment, raising awareness on compliance with the environmental standards and doing more systematic management activities are needed.

6.2 Project management structure

For an efficient performance management in project operation, performance indices such as waste disposal quantity, compost production amount and inflowing/discharging water quality are required. But overall data management, goals and performance management are not systematically established.

IV. LESSONS LEARNED AND RECOMMENDATIONS

1. Lessons Learned

1.1 Necessity of rapid response to stakeholders' resistance

The project was delayed for 6 years due to the complaints and resistance from residents and stakeholders.

1.2 Product design falling short of sufficient consideration of the recipient country's environment

In leachate treatment, a reverse osmosis (RO) facility is frequently applied to water treatment. Its efficient operation requires technologies to clean and operate a contaminated RO filter and to analyze post-treatment water quality. However, the local technological levels were not enough for post-leachate treatment water quality and operational management. For this reason, expert assessment should be reinforced in order to fully consider the recipient country's local environment and technology.

1.3 Considerations for contractor, construction and operation

In many aid projects, problems related to contractors' technological capacity and financial distress or their business continuity failure, such as bankruptcy and closure, frequently make it hard to secure reliability for the follow-up management after project termination.

The assessment was not conducted due to the contractor's closure.

2. Recommendations

2.1 Necessity of investigation into stakeholders' resistance before project implementation

The demands and opinions of residents and stakeholders should be more clearly and broadly investigated in the feasibility study stage

2.2 Necessity of design in consideration of the recipient country's environment

For proper facility operation and optimal maintenance, technical education and training need to be continued. Therefore, it is desirable to consider the environment and technological level of the recipient country in the feasibility study and design stages.

2.2 Necessity of strict assessment for constructor

Sufficient financial assessment for selection of builders of project is recommended so that advices for proper operation and management after the completion of the project could be gotten. Builders' business in the project was closed after the completion of the project.