Viet Nam

Ex-Post Evaluation of Japanese ODA Loan Project

Cai Lan Port Expansion Project

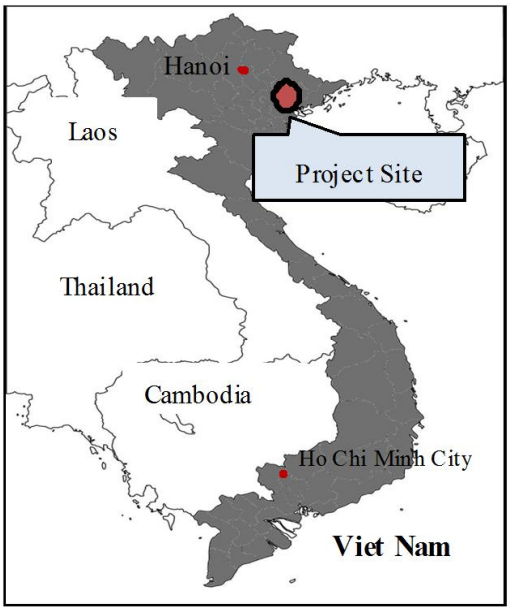
External Evaluator: Ryujiro Sasao, IC Net Limited

0. Summary

This project, the objective of which is to improve the basic maritime transport infrastructure in northern Viet Nam through expansion of the Cai Lan Port in Bai Chay Bay, Quang Ninh Province, is in agreement with the aid policies of the Japanese government as well as being in alignment with the development policies and development needs of Viet Nam. Thus it has a high degree of relevance. The volume of freight handled at this port grew steadily and the project is having an impact of contributing to the regional economy through increasing supply of materials to industrial parks and export of Vietnamese products.

However, this project has been evaluated to have a somewhat insufficient degree of efficiency since the project period has lengthened. There are also some technical issues requiring improvements in operation and maintenance as well. In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project location

Cranes installed at Cai Lan Port

1.1 Background

At the time of appraisal in 1995, nationwide, Viet Nam was interspersed with about 60 ports. Of these, 33 ports were suited to maritime shipping activities, while seven major ports were equipped to

function as international ports[1]. In the 1994 fiscal year, the total volume of cargo handled by the seven major ports was 11.81 million tons. The two ports of Saigon and Hai Phong together accounted for 82% of the cargo handled at all seven major ports, with Saigon handling 6.44 million tons and Hai Phong 3.25 million tons.

Berth no.1 at Cai Lan Port was completed in June 1995 and has been in operation since then. The volume of cargo handled at Cai Lan in 1995 was about 700,000 tons.

Problems in the port sector included insufficient investment in port as well as silting of routes and obsolescence of port facilities and cargo-handling equipment. These tendencies were particularly pronounced in the northern Viet Nam region. The scale of port facilities serving southern Viet Nam, centered on Ho Chi Minh City, was more than 3,000 meters when measured in total berth length and the volume of cargo handled reached 9 million tons[2]. The major part of these facilities in southern Viet Nam consists of container berths and general cargo berths, which were much bigger than northern Viet Nam in terms of the infrastructure functions of distribution ports and commercial ports[3]. It was necessary to expand the port infrastructure in northern Viet Nam as one means of achieving balanced development in Viet Nam and rectifying the disparity between north and south. At the time of appraisal Hai Phong Port was the only international port in northern Viet Nam and an urgent improvement project was conducted with the support of JICA's yen loan. In order to respond to the needs of population in the hinterland of northern Viet Nam of about 26 million people, however, port capacities were definitely in shortage.

1.2 Project Outline

The objective of this project is to improve the basic maritime transport infrastructure in northern Viet Nam by expanding the Cai Lan Port in Bai Chay Bay, in the city of Ha Long, Quang Ninh Province, thereby contributing to the promotion of socio-economic activity in northern Viet Nam.

Loan Approved Amount/ Disbursed Amount	10,273 million yen/9,335 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 1996/March 1996
Terms and Conditions	Interest Rate: 2.3% Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied aid (General untied aid for consultants as well)
Borrower/Executing Agency(ies)	Government of the Socialist Republic of Viet Nam/Viet Nam Maritime Administration

[1] Ports in northern Viet Nam are Hai Phong, Quang Ninh, Nghe Tinh, Da Nang, Quy Nhon, Nha Tran. There is Sai Gon port in southern Viet Nam.

[2] Source: "Report on the Development Plan of Port Development in Southern Viet Nam " (1994)

[3] According to the appraisal document, the number of container berths was 8 in northern Viet Nam (Cargo handled : 4 million tons in 1992) and zero in southern Viet Nam (Cargo handled only at general cargo berth: 0.75 million tons)

Final Disbursement Date	July 2008
Main Contractors	Civil engineering: Penta-Ocean Construction Co., Ltd. (Japan) Supply of facilities: Kanematsu Corp. (Japan)
Main Consultants	Nippon Koei Co., Ltd. (Japan), Netherlands Engineering Consultants (Netherlands), Port and Waterway Engineering Consultants (Viet Nam) (JV)
Feasibility Studies, etc. (if any)	JICA conducted the following feasibility study: Cai Lan Port Expansion Project Feasibility Study (February 1995, Overseas Coastal Area Development Institute of Japan/Nippon Koei)
Related Projects (if any)	National Highway No. 18 Improvement Project (I) (II), Bai Chay Bridge Construction Project and others

2. Outline of the Evaluation Study

2.1 External Evaluator

Ryujiro Sasao, IC Net Limited

2.2 Duration of Evaluation Study

Duration of the Study: December 2010 – November 2011

Duration of the Field Study: March 5 - 22, July 10 - 30, 2011

2.3 Constraints during the Evaluation Study

Information obtained from the O&M agency related to finance is limited and it was difficult to conduct detailed analysis of finance.

3. Results of the Evaluation (Overall Rating: B[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance with the Development Plan of Viet Nam

At the time of the appraisal, the Five-Year Socio-Economic Development Plan (1996 - 2000) mentioned the importance of improvements to and augmentation of the transportation infrastructure including development of port facilities, and the Vietnamese government's planned amount of investment in the transport sector was approximately US$Four billion, corresponding to one-quarter of total planned public investment plan (1996 - 2000).

At the time of the Ex-Post Evaluation, it was confirmed that, according to the Five-Year Socio-Economic Development Plan (2006 - 2010), 27.5% of the national budget was invested in the transport and telecommunications sector over the five-year period 2000 - 2005. This plan included an objective for the transport sector of "to be able to handle domestic freight and passenger transportation demand" and, regarding the maritime transport sector in particular, it calls for promotion of investment in the sector and expansion of international maritime transport services.

[4] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory
[5] ③: High; ②: Fair; ①: Low

"The Master Plan on Development of Viet Nam's Seaport System Through 2020, With Orientations Toward 2030" announced in December 2009 describes development objectives including "development of a comprehensive system of ports while putting Viet Nam's strengths to maximum use, in cooperation with neighboring countries that have advanced maritime transport sectors, with the goal of effecting the industrialization and modernization of the nation."

As part of the above objective, the plan also mentions that "importance will be placed on development of deep-see ports (such as this port) in all regions." Within the six groups of ports across Viet Nam, Cai Lan Port belongs to Group 1 (the northern Viet Nam group) and is one of the important ports in that group.

Thus, the transport sector, including ports, remained important in national development plans both at the time of the appraisal and at the time of the Ex-Post Evaluation. As mentioned in the above master plan as well, at present Viet Nam places importance on development of deep-see ports such as Cai Lan Port, and in this sense as well the importance of this project remains unabated.

3.1.2 Relevance with the Development Needs of Viet Nam

Despite a forecast of 8.1 million tons in port cargo handled in the northern region by the year 2000[6], under current conditions Hai Phong Port would have had the capacity to handle only about 6.2 million tons in the year 2000, even taking the urgent improvement project into consideration. For this reason, it was necessary to secure quickly a supplemental port to handle the projected excess of cargo over capacity in the year 2000. Although cargo handled in Hai Phong Port has increased by expanding container berths[7], Cai Lan Port's supplementary role to Hai Phong Port is significant currently[8].

Since the project's execution, for the most part the volume of cargo handled at Cai Lan Port has grown steadily (see "Effectiveness" below), so that it has been confirmed on an ex-post-facto basis as well that there was a high level of development needs.

3.1.3 Relevance with Japan's ODA Policy

According to data at the time of the appraisal, since resumption of ODA project lending to Viet Nam in fiscal 1993, JICA had been providing aid centered on infrastructure improvements, and JICA's country program for Viet Nam identified the transport sector as one of the most important aid fields, together with the electric power sector.

In Japan's ODA Annual Report 1997 of the Ministry of Foreign Affairs of Japan, part "6. Country ODA Policies for Main Countries" identifies the transport field as a key field in Viet Nam. Thus, at the time of appraisal, Viet Nam's transport sector was seen to be important in Japan's ODA policy, and this project has a high degree of relevance with Japan's ODA policy.

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[6] JICA feasibility study (F/S) on Hai Phong Port

[7] A look at the volume of freight handled in port at Hai Phong Port since the time of appraisal shows that, as forecast, the volume reached 8.6 million tons in 2001. Since Hai Phong Port too has advanced the expansion of container berths, the volume of freight handled at that port had reached 27 million tons as of 2008.

[8] About 80% of cargo arriving at Cai Lan Port is reloaded into smaller ships and transported to Hai Phong Port. (As Hai Phong Port is not a deep-see port, large vessels cannot enter.)

In light of the above, this project has been highly relevant with Viet Nam's development plan and development needs as well as Japan's ODA policy, therefore, its relevance is high.

3.2. Efficiency (Rating: ②)

3.2.1. Project Outputs

(1) Content of Construction, Procurement of Machinery, etc.

While minor changes have been made in route dredging and quay construction, there have been no major changes in other areas. Overall, changes in scope have had no particular negative effects on project objectives.

In route dredging, since the maximum size of vessels using the port was modified from the figure of 50,000 DWT anticipated during the feasibility study to 40,000 DWT in the detailed design (D/D)[9], the depth of dredging of routes and of the turning circle decreased. However, in contrast, the dredging of berths in front of quays was standardized at a deeper depth because of the improved construction technologies[10]. In quay construction, each of the three new berths is capable of handling larger vessels[11]. There were no major changes in procurement of cargo-handling machinery, procurement of tugboats and tenders, or other infrastructure improvements. Details are shown in the Table 1.

[9] DWT stands for dead weight tonnage, the maximum weight of freight (including the vessel's own fuel and other supplies) that can be loaded on a vessel. The berth development at Cai Lan port was assumed to be conducted in two phases and the 1st phase (this project) was only for three berths. It was judged that it was more economical to limit the route depth, assuming the maximum scale of vessels at 40,000DWT based on expected frequency of arrival of vessels. Accordingly, the route depth was decided at 10m. It is planned to increase the maximum scale of vessels to be received up to 50,000DWT and to conduct further dredging in order to make the route depth deeper in 2nd phase.

[10] About 2 years passed since appraisal to D/D.

[11] Original plan was that 2 berths' depth was 12 m corresponding to 30,000DWT vessels and 1 berth depth 13m corresponding to 40,000DWT vessels. But now all the 3 berths are 13m deep and can receive 40,000DWT vessels.

Table 1: Comparison of Scope (Original vs. Actual)

Item	Original	Actual	Reasons for Changes
1. Route Dredging			
Routes	11.0 m depth X 130 m width X 9 km total dredging length	10.0 m depth X 130 m width X 2 km total dredging length	・ Route depth decreased because the anticipated maximum size of vessels using the port was reduced. ・ Total dredging length was shortened because there were concerns about the impact of this project on the environment of Ha Long Bay prior to implementing the project. The remaining portions were dredged by Viet Nam side later, as a separate project.
Turning circle	13.0 m depth X 300 m diameter (2 circles)	11.0 m depth X 350 m diameter (1 circle)	Depth decreased because the anticipated maximum size of vessels using the port was reduced.
Berths in front of quays (three berths)	・ 12.0 m depth X 40 m width X 240 m total dredging length (B-2, B-3) ・ 13.0 m depth X 50 m width X 260 m total dredging length (B-4) (Water depth at time of appraisal: 7 - 8.4 m)	・ 13.0 m depth X 50 m width X 220 m total dredging length (B-5)* ・ 13.0 m depth X 50 m width X 200 m total dredging length (B-6) ・ 13.0 m depth X 50 m width X 200 m total dredging length (B-7) *Note: Berth numbers have been changed from original plans.	・ The depth of the three berths in front of the quays was standardized at 13 m because design changes made it possible to accommodate even larger vessels (40,000 DWT) in all three berths. ・ The total dredging length of the berths in front of the quays was shortened because the three berths were laid out in a straight line instead of having berths B-6 and B-7 project out into the bay as originally planned, as a result of design changes to the berths' shapes.
Volume of earth and sand dredged	8.49 million cubic meters	Approx. 2.61 million cubic meters	Due to shortening of total dredging length, the volume of earth and sand decreased.
Method of disposal of earth and sand dredged	・ Dumping: 5.6 million cubic meters (planned for dumping in waters near Cai Lan Port) ・ Use in land reclamation: 2.4 million cubic meters	The earth and sand were dumped in the sea in two locations away from Cai Lan Bay. (One location is about 30 km to the south, while the other is located about 20 km to the southeast of the port.)	Waters near Cai Lan Bay were chosen as dumping locations based on recommendations in the environmental impact report study conducted for the project, out of consideration for effects on the environment. To ensure there would be no impact on Ha Long Bay, earth and soil later dredged by Viet Nam government itself were dumped at a point approximately 47 km off the coast, with the permission of the relevant authorities.
2. Quay Construction			
New berths			
B-5	Public berth: 30,000 DWT	Public berth: 40,000 DWT	Because design changes made it possible to accommodate even larger vessels (40,000 DWT) in every berth.
B-6	Public berth: 30,000 DWT	Public berth: 40,000 DWT	
B-7	Public berth: 40,000 DWT	Public berth: 40,000 DWT	No change from plans
3. Procurement of cargo-handling machinery	Cranes, forklifts, various lifters, etc.	Cranes, forklifts, various lifters, etc.(Changes to details of cargo-handling machinery)	・ Berth shapes changed from original plans. ・ A number of machinery units were replaced with state-of-the-art models.
4. Procurement of tugboats and tenders	Three vessels in total	Three vessels in total	No change from plans
5. Other infrastructure improvements			
Roads inside port	18,612 m	Almost same	
Warehouses, container freight services, water- and power-supply facilities, office buildings/administration buildings (including machinery, materials, etc.)	1 set	1 set	In power-supply facilities, number of substations increased from one to two, corresponding to the actual demand.

Processing facilities for wastes such as ballast water discharge, waste oil, and solid wastes from vessels using the port	1 set (1 installed on land, 1 installed on sea)	1 set (2 installed on land, 1 special-purpose vessel to transport wastes from vessels calling on the port)	To enable overall cost savings

While equipment items such as cargo-handling machinery are being put to effective use, a typhoon in November 2006 caused two large cranes to overturn, resulting in serious damage. For budgetary reasons, these were replaced with used cranes of the same type. (This is not replacement of an entire set but assembling of separate parts.)As a result, crane processing capacity has decreased. The capacity would have been bigger, if the original cranes had been in use.

The layout of Cai Lan Port is shown in Figure 1.

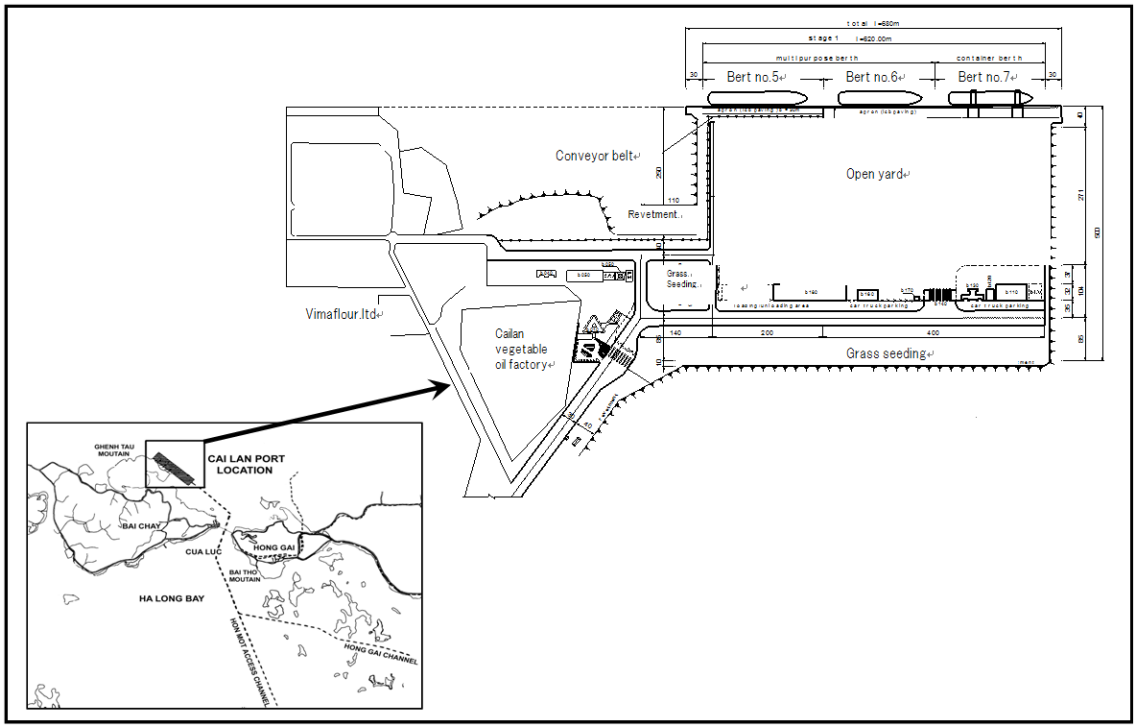

Figure 1: Layout of Cai Lan Port (Portions Covered in this Project)

2) Consultants

Activities planned originally were a review of the feasibility study, detailed design, assistance in bidding, and construction management and environmental studies (i.e., review of EIA[12], simulation of water quality after port construction, study of dredging methods (and disposal methods for dredged earth and sand), and detailed design of waste- and wastewater-processing facilities in the port). Results

[12] EIA stands for environmental impact assessment

show no particular changes in the content of activities anticipated.

Overall, the implementing agency evaluated contractors' and consultants' ways of working and senses of responsibility. However, as one point for improvement, there were problems in process control in connection with port civil-engineering construction. Frankly, the main contractor was not necessarily able to monitor the construction progress of subcontractors, resulting in delays in the progress of construction.[13] Subcontractors were financially weak and there were delays in mobilization of personnel and other activities.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project cost was planned originally at 9,227 million yen in foreign currency and 286,700 million Vietnamese dong (2,867 million yen*) in local currency, for a total of 12,094 million yen. Of this, plans called for arranging 10,273 million yen in yen loans and the balance of 1,821 million yen from the Vietnamese government budget.

* Exchange rate: 1 Vietnamese dong = 0.01 yen

The actual project cost was 6,342 million yen in foreign currency and 499,868 million Vietnamese dong (3,774 million yen*) in local currency, for a total of 10,116 million yen. Of this, 9,335 million yen was arranged in yen loans and the balance of 781 million yen came from the Vietnamese government budget.

* Exchange rate: 1 Vietnamese dong = 0.00755 yen

In Japanese yen terms, the actual project cost was 83.6% of the planned cost. Thus the cost was lower than planned (Sub-rating: ③).

This resulted from the fact that tough competition among the 11 companies that tendered bids on the construction led to decreased costs (the bid amount was about 20% less than planned) and the fact that the exchange rate of the Vietnamese dong against the Japanese yen decreased by about 30%, even though expenditures did increase mainly due to extension of the construction period.

When adjusting for the portion of route dredging included in the original plans that was eliminated from the project, the overall cost decreases to 10,575 million yen. Using this amount as the revised planned figure, recalculation of the comparison between actual and planned costs results in a ratio of 95.7% (with no change in the sub-rating).

3.2.2.2 Project Period

For this project, the period from the signing of the Loan Agreement (L/A) (March 1996) until the

[13] According to JICA documents, the consultants made a similar point. One cause may be the fact that construction was carried out in a multi-tiered structure, including subcontractors and further sub-subcontractors.

completion of the civil-engineering construction (August 2000) was planned to be four years and six months. Actually, while the L/A was signed as planned in March 1996, the civil-engineering construction was completed in June 2004. That is, the project period planned to last four years and six months in fact lasted eight years and four months, significantly longer than planned, at 185.2% of the planned period (Sub-rating: ①).

The main reasons for the lengthening of the project period were a longer time spent on "P/Q,[14] bidding, and contracts" (18 months or 64% longer than originally planned) and a longer time spent on construction, particularly berth construction and dredging work in front of berths (12 months or 38% longer than originally planned).

In the case of the former, "a longer time spent on pre-qualification, bidding, and contracts," the reason was that a diverse range of proposals was made by bidding firms concerning construction methods, requiring a very long time to consider them. In the case of the latter, a longer time spent on "berth construction and dredging work in front of berths," the reasons included the time consuming procedures for approval of a change in berth construction methods (from excavation to blasting), additional construction, and inadequate process control by contractors. While the extended construction period was a main cause of cost increases in terms of construction costs and consultant MM, the overall project cost was lower than originally planned.

3.2.2.3 Consulting Services

The plan and results of consultants' MM are as follows.

Table 2: Consultant MM

Item	Plan	Results	Reasons for Changes
Phase 1 (feasibility study review and detailed design)			
- Foreign experts	123	123	
- Local consultants	52	52	
Phase 2 (bidding assistance and construction management)			
- Foreign experts	118	149.9	Phase 2 consultant MM increased due to an increase in supervisory activities in connection with extension of the construction period for package 1 (berth construction and dredging in front of berths) and an increase in supervisory activities for construction of the office building and administration building, which was added to the original scope of the project.
- Local consultants	73	181.4	

In light of the above, although the project cost was within the plan, the project period significantly exceeded the plan. Therefore, the efficiency of the project is fair.

[14] P/Q stands for pre-qualification.

3.3 Effectiveness (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

Table 3: Forecast and Actual Volumes of Freight Handled etc.

Unit: thousand tons

	1994 (Actual)	2000 (Forecast)*1	2000 (Actual)	2005 (Actual)	2006 (Actual)	2007 (Actual)	2008 (Actual)	2009 (Actual)	2010 (Actual)
Cai Lan Port freight volume	n.a.	1,978	1,533	3,185	3,499	2,805	2,903	4,736	5,853
(Container freight included in above figure*2)	n.a.	610	n.a.	119	133	34	33	185	204
Passengers (large tourist vessels arriving from overseas)	n.a.	n.a.	n.a.	n.a.	10,472	17,735	22,101	2,155	5,288
Number of vessels arriving	n.a.	n.a.	n.a.	322	481	493	509	421	428
Reference: Hai Phong Port freight volume	3,280	6,200	n.a.	15,147	18,015	22,632	27,067	n.a.	n.a.

Sources: Materials from the appraisal, the operation and maintenance company, Quang Ninh Port Limited Liability Company (LLC), and the Viet Nam Maritime Administration

*1 The originally planned date of completion of civil-engineering construction was August 2000. Actual civil-engineering construction was completed in June 2004.

*2 Actual figures on container freight volume are measured in units of thousand TEU, which differs from the unit of tons used in forecast values.

As seen in the table above, the volume of freight handled at Cai Lan Port is increasing steadily. While the actual figure for 2000 is lower than the forecast figure, the volume of freight in 2005 had reached the level of 3.185 million tons. Taking into consideration the fact that completion of the civil-engineering construction was delayed by about four years, the project can be said to have generated sufficient results. According to the operation and maintenance company, the decrease in freight handled in 2007 and 2008 was due to the fact that two cranes were overturned and badly damaged in a typhoon in November 2006, requiring two years for their replacement. The decrease in the number of passengers in 2009 appears to represent a decrease in tourists as a result of the global economic slowdown following the so-called Lehman Brothers shock.

Comparison of trends in the volume of freight handled at Cai Lan Port with those at other ports in Viet Nam shows that the port's rate of increase largely was the same as the national average over the years 2000 - 2008. However, comparison of the two periods of the years 2000 - 2004 prior to port expansion and the years 2004 - 2010 after expansion shows marked growth after expansion, with an annual average rate of growth in freight volume of 12.1% in the former period as opposed to a rate of 20.4% in the latter.

Among the originally anticipated indicators, those such as berth occupancy rates and average waiting time are not available because the operation and maintenance company does not collect or measure such data. However, from interviews with a number of firms using the port, it appears that "waiting time" is relatively short and users do not feel inconvenienced.

It is conceivable that the growth in freight handled at Cai Lan Port is an effect of improvements in

road conditions resulting from the National Highway No. 18 Improvement Project along with improvements in access roads from National Highway No. 18 to Cai Lan Port[15]. That is, movement of freight from within and outside Quang Ninh Province using National Highway No. 18 is increasing. The average annual rate of increase in traffic (annual average daily traffic) between Bieu Nghi and Bai Chay[16] on National Highway No. 18 over the years 2005 - 2010 is 24.7%, and even among firms located in the Thang Long Industrial Park in suburban Hanoi, about 130 km from the port, 14.3% use Cai Lan Port (according to the results of the Ex-Post Evaluation of Japanese ODA Loan Aid Project conducted this fiscal year). In the vicinity of Cai Lan Port is the Cai Lan Industrial Park, which has an occupancy rate of 100 percent. Firms located in this industrial park use the port for import and export of materials and products.

Among the main products exported from Cai Lan Port in recent years, coal, lumber, and ore are products of the local Quang Ninh Province, exported to markets such as Japan and China. A Japan-affiliated firm producing wood chips for use in papermaking is located in the Cai Lan Industrial Park as well.

Among imported products, vegetable oil and livestock feed are undergoing marked growth. Vegetable oil is a raw material used in foodstuffs, and it is consumed in the Cai Lan Industrial Park. The growth of import of livestock feed is thought to be a response to the development of the livestock industry in Quang Ninh Province and northern Viet Nam. The annual rate of growth in number of livestock over the years 2000 - 2008 was 8.2% in Quang Ninh Province and 7.3% in northern Viet Nam.[17]

There are reasons to expect both positive and negative movements in the future when forecasting business performance at Cai Lan Port. A negative factor is the planned construction beginning in 2015 of a separate deep-sea port (Lach Huyen) in the vicinity of the existing Hai Phong Port[18]. There are concerns that over the long term large vessels that cannot enter Hai Phong port and use Cai Lan Port could shift to the new port. A positive factor is the plan for construction of a railway between Hanoi and Cai Lan, currently targeted for completion in 2014. It is anticipated that this would increase the volume of freight handled at Cai Lan Port. In addition to the above, in consideration of the fact that at present the volume of freight handled at Hai Phong Port is approaching the maximum limit[19] and the presence of logistics needs resulting from future expansion of industrial parks near Cai Lan Port, it is likely that the importance of Cai Lan Port will remain unshaken.[20] As a future strategy for the port, it

[15] The following paragraphs are written based on the information collected in other ex-post evaluation researches in transport sector in north Viet Nam conducted this year as well.
[16] Bai Chay is adjacent to Cai Lan Port.
[17] Source: General Statistics Office of Viet Nam
[18] Assistance by yen loan is expected.
[19] According to related parties, physically there is no room for future expansion in Hai Phong Port.
[20] In northern Viet Nam, the route connecting National Highway No. 5 to Hai Phong Port and the route connecting National Highway No. 18 to Cai Lan Port are in competition with each other as the two major logistics routes. Comparison of the routes in terms of traffic volume and volume of freight handled shows that the former is far and away the larger of the two. The following information shows a possible further advantage for Cai Lan Port. Viet Nam currently has set up truck weighing checkpoints in just two locations, including National Highway No. 18, on a pilot basis as an effort to prevent overloading. According to related parties on the Viet Nam side, including the operation and maintenance company, this is an important factor encouraging use of National Highway No. 5 and Hai Phong Port in comparison with National Highway No. 18 and Cai Lan Port. According to the Ministry of Transport, plans call for installation of 41 checkpoints nationwide, and at present the

is thought that it would be desirable to increase the port's independence through decreasing somewhat the relative importance of its functioning as a supplemental port to the existing Hai Phong Port, with an eye toward the opening of Lach Huyen Port a few years from now.[21]

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

Financial Internal Rate of Return (FIRR)

Table 4: Comparison of FIRR between Plan and Actual

	At appraisal (Plan)	Actual at Ex-post evaluation (Re-calculation)
FIRR	4.11%	7.81%
(Grounds)		
Project life	36years	Same as left
Cost	Construction cost, O&M expense and renewal investment	
Benefit	Revenue from port services	

Table 4 compares FIRR before and after the project. Financial profitability is higher than at appraisal, as smooth increase of cargo handled exceeds initially expected benefit in spite of project cost which is higher than plan. (based on Vietnamese dong)

Economic Internal Rate of Return (EIRR)

Table 5: Comparison of EIRR between Plan and Actual

	At appraisal (Plan)	Actual at Ex-post evaluation (Re-calculation)
EIRR	19.10%	25.04%
(Grounds)		
Project life	31years	Same as left
Cost	Construction cost, O&M expense and renewal investment	
Benefit	Additional value added by Cai Lan port	

Table 5 compares EIRR before and after the project. Economic profitability is higher than at appraisal, as smooth increase of cargo handled exceeds initially expected benefit in spite of project cost which is higher than plan. (based on Vietnamese dong)

ministry is in the middle of closely examining lessons learned from the pilot checkpoint on National Highway No. 18. In the future, similar checkpoints will be installed on National Highway No. 5 as well, and there is a possibility that flow of goods then could shift to National Highway No. 18 and Cai Lan Port.

[21] Measures needed for this purpose are touched on in the "Recommendations" section.

3.3.2 Qualitative Effects

As part of analysis of the process of realization of port functions, ten (10) companies (including freight shipping companies and maritime companies) using the port and having offices in the vicinity of the port were interviewed concerning whether there were any bottlenecks in use of the port.

To summarize the results, these firms were unanimous in identifying as a strength of the port its water depth. Other strengths identified were its affordable usage charges and the fact that the port is not crowded. However, multiple firms identified as weaknesses of the port its shortage of facilities for logistics operations after unloading cargo (i.e., warehouses and parking lots) and its insufficient facilities (functions) for use in loading and unloading of cargo.

When asked their overall evaluation of this project (five grades)[22], six of these interviewed firms said it was "good," three said it was "neither good nor bad," and one said it had "some problems."
In light of the above, this project has largely achieved its objectives, and its effectiveness is high.

3.4 Impact

3.4.1 Intended Impacts

The anticipated impact of this project at the appraisal stage was "promotion of socio-economic activities in northern Viet Nam." On this point, the impact of the project on Quang Ninh Province, where it is thought that this project would have a significant direct impact for geographical reasons, was confirmed.

Objectives largely have been achieved for the main indicators to be achieved by 2010 in Quang Ninh Province's long-term socio-economic development plan, shown below.

Table 6: Main Indicators in Quang Ninh Province's Long-Term Socio-economic Development Plan

	2005 (Actual) *1	2006 - 2010 Annual average growth rate (Forecast) *1	2006 - 2010 Annual average growth rate (Actual) *2
Population growth rate (Annual average %)	1,070,000	1.00%	1.74%
Annual average regional GDP growth rate (Prices fixed at 1994 levels)	6,229 (VND 1 billion)	13%	12.13%

Sources:

*1 Quang Ninh Province Master Plan

*2 Quang Ninh Province Statistics Office

Also taking into consideration the other economic indicators and information shown below, this project is surmised to have made a certain contribution to the development of the northern economic zone of Viet Nam, centered on Quang Ninh Province. According to appraisal documents, four expected effect/impacts are mentioned as follows. 1.Efficient distribution of goods, 2. Effect of

[22] Five grades: "very good," "good," "neither good nor bad," "some problems," "many problems"

investment promotion, 3. Increase of employment opportunities, 4. Promotion of regional economic development. Item 1 is confirmed by the realization of both qualitative and quantitative effect. Item 4 is verified to a certain degree by the Table 7, for example. With regard to the remaining item 2 and 3, promotion of distribution by the expansion of the port is estimated to have contributed to the increase of investment and employment by logistics companies and manufacturers who use the port. Contribution to Cai Lan industrial park which is located closely to the port (only 1.5 km away) is evident[23].

Table 7: Other Main Economic Indicators in Quang Ninh Province

Indicator	2005	2006	2007	2008	2009	2010
Business sales (billion VND)	10,172	11,782	15,942	18,765	21,593	n.a.
Volume of freight transported (thousand tons)	9,034	9,976	13,238	14,346	15,984	n.a
Volume of freight handled at Cai Lan Port (thousand tons)	**3,185**	**3,499**	**2,805**	**2,903**	**4,736**	**5,853**
Agricultural production (tons)	1,782,150	1,720,870	2,616,525	3,382,815	3,444,379	n.a
Industrial production (billion VND)	23,451	29,118	39,393	53,623	64,818	n.a
Per-capita income (USD/month)	721.7	887.1	1043.5	1,134.9	1,158.4	1,293.9

Sources: Quang Ninh Province Statistics Office, project office (PMU)

This project's civil-engineering construction was completed in June 2004, and Quang Ninh Province's economic indicators show steady growth after that date. While a simple numerical comparison is not possible, the fact that the volume of freight handled at Cai Lan Port has grown to nearly one-third the volume of freight transported in Quang Ninh Province shows the importance of the port.

As a contribution of the port to industrial production, as mentioned above products of the local Quang Ninh Province such as coal, lumber, and ore are among the main products exported from Cai Lan Port to markets such as Japan and China. Cai Lan Port contributes to the promotion of industrial parks in Quang Ninh Province in the areas of purchasing (raw-material procurement), distribution, and sales, and a Japan-affiliated firm producing wood chips for use in papermaking is located inside the nearby Cai Lan Industrial Park.

Results of a survey concerning the impact of this project on recipients (residents) are described below.

The total number of resident respondents was 110 people, sampled from the vicinity of the port in a manner intended to avoid concentration on specific locations as much as possible. Respondents consisted of roughly even numbers of males and females, and their main occupations were company employees, business people (e.g., store managers), and public employees. Nearly 60% of respondents

[23] According to the developer of Cai Lan industrial park, the major reason of enterprises' investment in Cai Lan industrial park is its location near the port. The lots for enterprises (Phase 1) were sold out in 2010 and about 5 thousand people are employed in the park.

went to the port at least twice a month (for work reasons, strolling, or other reasons). 35 respondents said that they worked at the port.

Specific responses concerning the impact of this project are listed below.

(1) Employment opportunities — Have new employment opportunities become available or has business grown since this project? Yes (40.9%); No (59.1%)

(2) Changes in income — Has household income increased since this project? Yes (50.0%)[24]; No (50.0%)

(3) Impact on business land or houses — Has the project had any impacts such as forcing you to sell land or relocating your residence? Yes[25](2.7%); No (97.3%)

(4) Environmental changes since the project (only main items excerpted below, with percentages of respondents giving each answer):

Item	Worsened	No change	Improved
Air*	39.1	60.9	0
Noise*	33.6	66.4	0
Water quality	7.3	91.8	0.9

* Due to noise or exhaust from trucks and trailers entering and exiting the port

(5) Overall evaluation of project benefits:

Item	Percentage of Respondents (%)
Excellent	11.8
Good	58.2
Fair	30.0
Poor	0
Very poor	0

Although economic impact is confirmed in the above questionnaire survey, this is due to the fact that respondents live near the port and the impact does not necessarily mean the similar impact in the entire province. While some local residents were conscious of negative effects on the environment, these were not severe in degree.

3.4.2 Other Impacts

(1) Impacts on the natural environment

Ecosystems: At the time of the appraisal, it was confirmed that there was a mangrove forest important to preservation of ecosystems on the project site, and it was necessary to give consideration

[24] Specific examples of increased income include increased sales at stores, bars, and restaurants near the port due to an increased number of workers at the port, increased sales for shipping companies, and new employment at the port (such as port workers and security guards).

[25] While this 2.7% (three persons) had to sell their land, they are generally satisfied with the level of compensation.

to making it possible to protect the mangrove forest as much as possible. While the mangrove forest was cut where unavoidable, a mangrove reforestation project was conducted by the Quang Ninh Department of Natural Resources and Environment (QN DONRE), planting new mangroves in multiple adjoining areas.

Dredging the route and other places was conducted under the supervison of Quang Ninh Department of Nature Resource and Environment. The operation and maintenance company of the port conducts environment monitoring in the vicinity of the port every six months.[26] According to its report[27] for December 2010, the project has cleared government standards in all areas, including air, noise, water quality, and drainage. To prevent illegal dumping in the sea by voyaging vessels, in cooperation with the VMA, navy and environmental police carry out activities including patrolling, monitoring, and penalizing all acts that could bring about sea pollution.

Furthermore, no particular problems regarding the natural environment were identified. The external evaluator visited the site several times but did not feel any inconvenience. When asked about the environment impact of the project in the survey of recipients (residents), more than 60% of the respondents said that the situation of environment had not changed after the project.

Scenery: Ha Long Bay is a valuable scenic spot that was named a UNESCO World Heritage Site in December 1994. In construction at Cai Lan Port, it was necessary to pay attention to the impact on scenery. While originally there were concerns about negative impacts on the activities of tourist craft and on the scenery due to increased cargo-vessel traffic, since completion of the project traffic has been roughly 2 - 3 vessels per day[28], presenting no particular problems.

(2) Land Acquisition and Resettlement

Originally, this project was not expected to result in any resettlement. In the end, it did have the following impacts on residents and existing facilities and the compensation based on the Vietnamese law[29] was paid as follows.

- Since 12 households needed to be moved, they were paid compensation.
- Two temples were asked to relocate, and they were compensated for the costs of moving and rebuilding.
- One berth owned by an oil company was relocated, and the cost of its relocation was paid to the company.

The amounts of compensation totaled about 700 million dong to the 12 households and two

[26] Pursuant to Viet Nam's Law On Environmental Protection. The purpose is to implement necessary measures, if any pollution was identified by environment monitoring.
[27] Title is "Report on periodical environmental monitoring".
[28] Prior to this project, the number of cargo vessels landing was 2 - 3 per month.
[29] Decree 22/ND-CP dated April 24, 1998, on Compensation policy for affected people, bodies when their land is used by Government for public purposes.

temples and about 6,100 million dong for the cost of berth relocation.

(3) Other Positive/Negative Impacts

Since the ferries that could be obstacles to passage of large vessels in maritime transportation on the Cua Luc Straits ceased operation in March 2007 with completion of the Bai Chay Bridge, one anticipated concern has been swept away.

In the survey of recipients (residents) conducted during the Ex-Post Evaluation, in addition to the already stated economic effects, a number of respondents identified improvements to scenery and positive tourism effects (increased numbers of tourists) as well.[30]

As described above, generally the anticipated impact has been realized. According to the beneficiary survey, interviews and the evaluator's own observation, no particular negative impacts are apparent.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

Management and operation of the port following completion of the facilities is conducted by Quang Ninh Port LLC, a subordinate organization of the VMA. The VMA owns the port facilities at Cai Lan Port, and Quang Ninh Port pays leasing fees to the VMA as the port facility operator[31], while at the same time collecting fees from the businesses it conducts, such as freight loading and unloading, arrangement of freight in the port, storage of freight (on and off port premises), transfer and transport of freight, and buying and selling of petroleum. Quang Ninh Port has 1,036 employees.

The organization of Quang Ninh Port LLC is divided into three main bureaus: the Operation, Economics, and Technique bureaus. In operation and maintenance of the port facilities at Cai Lan Port, the Infrastructure and Environment Dept., part of the Technique Bureau, plans and monitors maintenance for the facilities as a whole. The Technique Dept., also part of the Technique Bureau, handles repairs to vehicles and equipment. Berths (1, 5, 6, 7) are operated individually by three subsidiaries of Quang Ninh Port LLC, under the supervision of the head of the Operation Bureau.[32] According to Quang Ninh Port LLC, in general it has a sufficient number of employees employed in maintenance and management, and the structure is a stable one with a high employee retention rate.

3.5.2 Technical Aspects of Operation and Maintenance

The state of operation and maintenance conducted by Quang Ninh Port LLC of the main facilities and equipment is outlined below.

1) Subject facilities and equipment: various cranes, trucks, bulldozers, forklifts, etc.

[30] In this survey there is a possibility that some answers include the impact of the neighboring Bai Chay Bridge, which actually is a separate project.
[31] Both parties have concluded a 25-year lease agreement.
[32] The total number of employees of the three companies is 570 persons.

2) Specific operation and maintenance tasks: Tasks common to all facilities and equipment include replacement of lubricants, checking the functions of individual components and replacing components that have problems, filter cleaning and replacement, and checking cooling systems (e.g., checking whether sufficient cooling water is maintained).

3) Frequency of tasks: Some tasks are conducted upon completion of loading and unloading for a single vessel, while others are conducted periodically. (Details depend on the type of equipment.)

4) Use of manuals: Manuals issued by product manufacturers and Cai Lan Port's own manuals are used.

5) Securing spare parts: While in some cases it is difficult to procure parts for gantry cranes, there are no problems for other equipment.

Employees in the Infrastructure and Environment Dept., which handles planning and monitoring of maintenance for facilities as a whole, possess appropriate skills and knowledge. However, the skill level of employees still cannot be described as flawless concerning repairs to facilities and vehicles, since state-of-the-art models are used. For this reason, about four employees involved in site operations and repairs are sent to the Port of Ho Chi Minh City for roughly three months of on-the-job training per year. A manual prepared by a consultant to this project is used in port operations.

Interviews with port users in the recipient survey identified the following issues concerning the port's cargo-handling equipment and operation by workers. The problems below need to be resolved in order to grow Cai Lan Port's business in the future under conditions of competition with other ports.

- It still takes longer to process a container than at Hai Phong Port (problems in skills and efficiency for group work).
- The capacity of the equipment used in handling general freight is insufficient and work takes too long (problems with equipment).
- The quality of the container terminal management system (CTMS[33]) is poor, so that it cannot adequately handle tasks such as identification of the current locations of freight to be handled (problems with facilities).

3.5.3 Financial Aspects of Operation and Maintenance

Financial situation of operation and maintenance company, Quang Ninh Port LLC is shown below. Financial situation has been improving over time and is in the desirable condition.

[33] While the CTMS is a standardized system, detailed specifications vary by port.

Table 8: Financial situation of Cai Lan Port (Berth 5, 6 and 7)

Unit: Million VND

Year	Total revenue	Profit and loss*
2010	150,013.12	1,784.80
2009	121,008.98	1,210.13
2008	77,612.56	-3,996.23
2007	57,724.49	-3,542.85
2006	63,427.88	678.89
2005	48,738.78	n.a.

*Note: + means profit and – means loss.

3.5.4 Current Status of Operation and Maintenance

According to the operation and maintenance company, overall the state of facilities and equipment is good. Actually the evaluator confirmed that main equipment is functioning at the time of site visit. However, some facilities have what appear to be water leaks (in the water-supply facilities) and fine cracks (in the roads in front of berths). These will need to be repaired in the future.

Also, to secure a certain level of water depth, continual dredging is underway in the port, conducted by Quang Ninh Port LLC in front of the berths and by the VMA in routes.

In light of the above, some minor technical problems have been observed in terms of operation and maintenance, and therefore sustainability of the project's effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project has the objective of improving basic maritime transport infrastructure in northern Viet Nam through expanding Cai Lan Port. Since it is in alignment with the development plans and development needs of Viet Nam and is in agreement with Japan's ODA policy, it has a high degree of relevance. The volume of freight handled at this port grew steadily and the project is having an impact of contributing to the regional economy through increasing supply of materials to industrial parks and export of Vietnamese products.

However, since the project period was lengthened, the project is evaluated to have a somewhat insufficient level of efficiency. There also are some technical issues that need improvement in the areas of operation and maintenance.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

Based on comprehensive consideration of the port's strengths and weaknesses and external opportunities and threats, as touched on under section 3.3 (Effectiveness) of this report, considering the opening of a new deep-sea port planned to open a few years from now in particular to be the greatest threat, it is thought that the port should aim to raise the level of port services overall, so that at the time the new port opens Cai Lan Port will have a more independent role instead of just serving in a

role supplemental to Hai Phong Port. For this reason, the following relatively less costly measures are recommended over the short term and the measures below involving greater capital expenditure are recommended over the long term.

Short-term recommendations:

In interviews with logistics companies and other related parties, matters such as unsatisfactory container processing efficiency and inadequate CTMS performance were identified as this port's weaknesses. To respond to these problems, measures such as training of port employees and improvements to the CTMS are proposed. In implementing such measures, it also is important to identify the detailed needs of multiple clients.

Medium and long-term recommendations:

Enhancement of facilities through the following measures is recommended to improve port services.

- Strengthening crane capacity (The operation and maintenance company already has plans to strengthen crane facilities by 2015. Steady implementation of those plans would be desirable.)
- Development of facilities for logistics operations after unloading freight (i.e., warehouses and parking lots).

4.2.2 Recommendations to JICA

No particular recommendations

4.3 Lessons Learned

Nothing in particular to report

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
(1) Project Outputs		
1. Route dredging		
Routes	11.0 m depth X 130 m width X 9 km total dredging length	10.0 m depth X 130 m width X 2 km total dredging length
Turning circle	13.0 m depth X 300 m diameter	11.0 m depth X 350 m diameter
Berths in front of quays (three berths)	・ 12.0 m depth X 40 m width X 240 m total dredging length (B-2) ・ 12.0 m depth X 40 m width X 240 m total dredging length (B-3) ・ 13.0 m depth X 50 m width X 260 m total dredging length (B-4) (Water depth at time of appraisal: 7 - 8.4 m)	・ 13.0 m depth X 50 m width X 220 m total dredging length (B-5)* ・ 13.0 m depth X 50 m width X 200 m total dredging length (B-6) ・ 13.0 m depth X 50 m width X 200 m total dredging length (B-7) *Note: Berth numbers have been changed from original plans. B-2, B-3, and B-4 are now used as the numbers of berths planned for construction in the future on currently unoccupied land.
Volume of earth and sand dredged	8.49 million cubic meters	2.61 million cubic meters
Method of disposal of earth and sand dredged	・ Dumping: 5.6 million cubic meters (planned for dumping in waters near Cai Lan Port) ・ Use in land reclamation: 2.4 million cubic meters	The earth and sand were dumped in the sea in two locations away from Cai Lan Bay. (One location is located about 30 km to the south, while the other is located about 20 km to the southeast of the port.)
2. Quay construction		
New berths		
B-5	Public berth: 30,000 DWT	Public berth: 40,000 DWT
B-6	Public berth: 30,000 DWT	Public berth: 40,000 DWT
B-7	Public berth: 40,000 DWT	As planned
3. Procurement of cargo-handling machinery	Cranes, forklifts, various lifters, etc.	Cranes, forklifts, various lifters, etc. (changes to details)
4. Procurement of tugboats and tenders	Three vessels in total	As planned
5. Other infrastructure improvements		
Roads inside port	18,612 m	Almost same
Buildings	Warehouses, container freight services	As planned
Construction of water- and power-supply facilities (including machinery, materials, etc.)	1 set	1 set
Office building/administration and management building (including machinery, materials, etc.)	1 set	1 set
Processing facilities for wastes such as ballast water discharge, waste oil, and solid wastes from vessels using the port	1 set (1 installed on land, 1 installed on sea)	1 set (2 installed on land, 1 special-purpose vessel to transport wastes from vessels calling on the port)
(2) Project Period	March 1996 - August 2000 (54 months)	March 1996 - June 2004 (100 months)
(3) Project Cost Foreign currency Local currency Total Japanese ODA loan portion Exchange rate	 9,227 million yen 2,867 million yen (Local currency: 286,700 million Vietnamese dong) 12,094 million yen 10,273 million yen 1 Vietnamese dong = 0.01 yen (At time of appraisal)	 6,342 million yen 3,774 million yen (Local currency: 499,868 million Vietnamese dong) 10,116 million yen 9,335 million yen 1 Vietnamese dong = 0.00755 yen (Average between January 1998 and December 2008)