

Ex-Post Evaluation Report of Japanese ODA Loan Projects 2008 (Thailand, Indonesia IV)

November 2009

JAPAN INTERNATIONAL COOPERATION AGENCY

OPMAC Corporation

Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, external evaluations conducted by experts shall be enhanced.

This volume shows the results of the ex-post evaluation of Japanese ODA loan projects that were mainly completed in fiscal year 2007. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

November 2009

Atsuo KURODA

Vice President

Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA.

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Thailand

Ex-post Evaluation of Japanese ODA Loan Project
“Regional Road Improvement Project (III)”

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Field Survey: June - July 2009

1. Outline of the ODA Loan Assistance



Map of the project site



Project target road
(Don Sak-Sichon section in Surat Thani)

1.1 Background

In Thailand, transport falls into five major areas: road transport, railway transport, maritime transport, inland water transport and air transport. Road transport plays an important role in the Thai transport system. For example, the share of road transport of the total cargo transport volume of all transport systems (ton-km base) in 1998 was 90.9%. Although the main trunk highways in Thailand were well developed and its pavement ratio was 97.9% in 1999, expansion of traffic capacity for existing roads was an important issue as traffic volume increased year by year. Likewise, there was a remarkable increase in traffic volume in regional areas, and the lack of capacity of roads was creating a bottleneck in the smooth transport of domestic cargo. With this background, the First Phase of the Four-Lane Highway Widening Project (target length: 1,891km) was planned in 1993 as a development plan for the main trunk highways. This Four-Lane Highway Widening Project was given the highest priority in road sector development as well as priority budget allocation among road rehabilitation projects. In addition, the Second Phase of the Four-Lane Highway Widening Project (target length: 4,638km) was established in 1995, and the improvement of the major two-lane national highways to four-lane roads was further promoted.

1.2 Objective

The objective of this project was to improve to four-lane national highways 343 km of the two-lane national roads which connect the North-South Corridor and the East-West Corridor in Thailand in order to cope with the increasing traffic volume, improve velocity and reduce traffic accidents, thereby contributing to the regional economic development and the promotion of economic relations with neighboring countries.

1.3 Borrower / Executing Agency

Kingdom of Thailand / Department of Highways (DOH), Ministry of Transport

1.4 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	19,544 Million Yen / 17,069 Million Yen
Exchange of Notes / Loan Agreement	September 19, 2000 / September 22, 2000
Terms and Conditions - Interest Rates - Repayment Period - Grace Period - Conditions of Procurement	2.2% p.a. (Consultant portion: 0.75 p.a.) 25 years (Consultant portion: 40 years) 7 years (Consultant portion: 10 years) Partial Untied
Final Disbursement Date	January 19, 2007
Main Contractor (Over 1 billion yen)	PRAYOONVISAVA ENGINEERING CO., LTD. (Thailand) / ITALIAN-THAI DEVELOPMENT PUBLIC COMPANY LIMITED (Thailand) / VICHITBHAN CONSTRUCTION CO., LTD. (Thailand) / NIPPON ROAD-BHROM VIVAT JOINT VENTURE (Thailand) / SEE SANG KARN YOTAH (1979) CO., LTD. (South Korea) / CHRISTIANI & NIELSEN (THAI) PUBLIC COMPANY LIMITED (Thailand) / SERMSANGUAN CONSTRUCTION CO., LTD. (Thailand)
Main Consultant (Over 100 million yen)	Joint Venture of NIPPON KOEI (Japan) - TEAM CONSULTING ENGINEERING AND MANAGEMENT CO., LTD. (Thailand) - THAI ENGINEERING CONSULTANTS CO., LTD. (Thailand)
Feasibility Study, etc. (F/S)	Feasibility study (Thai Government) in 1998 Regional Road Improvement Project (I) in 1994 Regional Road Improvement Project (II) in 1995

2. Evaluation Results (Rating: A)

2.1 Relevance (Rating: a)

This project was highly relevant to Thailand's national policies and development needs at the time of both appraisal and ex-post evaluation; therefore its relevance is high.

2.1.1 Consistency with Thailand's Development Policy and the Mekong Region Development Policy

At the time of appraisal, the 8th National Plan for Economic and Social Development (1997-2001) announced the establishment of a rapid transport system between major cities and a mass transport system between Bangkok and its suburb areas. In line with this policy, the Second Phase of the Four-Lane Highway Widening Project (target length: 4,638km) was planned in January 1995. The objectives of the Second Phase Four Lane Project were (i) to cope with the increasing traffic demand, (ii) to promote regional economic development and economic relations with neighboring countries by linking cities and regions, and (iii) to lessen traffic accidents as a continued project of the First Phase¹ which mainly improved the main trunk highways crossing North to South. This project, i.e. the Regional Road Improvement Project (III) was a part of the components of the Second Phase of the Four-Lane Project.

At the time of ex-post evaluation, the 10th National Economic and Social Development Plan (2007-2010) set the following missions: (i) human resource development, (ii) regional and social based development, (iii) enhancement

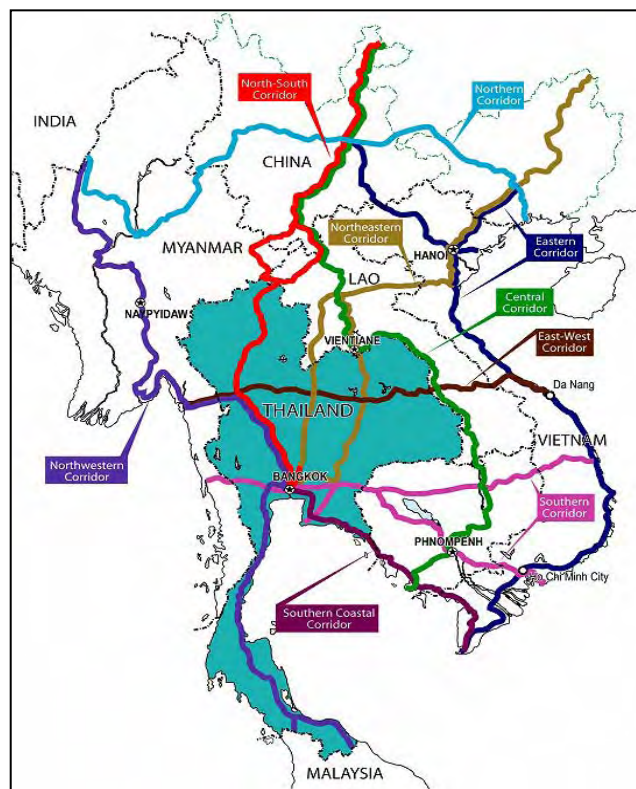


Figure 1: GMS Economic Corridor

¹ The First Phase of the Four-Lane Highway Widening Project (target length: 1,891km) was established in February 1993 in order to attain the following objectives of the 7th Road Development Plan (1992-1996): (i) construction of inter-city motorways, (ii) widening of the existing major trunk highways between Bangkok and major regional cities and emerging economic regions, (iii) rehabilitation of the existing national highways network for the improvement of transport efficiency, and (iv) increase in road traffic safety. In association with the First Phase Project, JICA financed the two ODA loan projects "Regional Road Improvement Projects (I) and (II)" (project cost: 23,848 million Yen, project period: 1994-2001) and about 630 km of the national highways in the center and south of Thailand were widened through these ODA loan projects.

of economic efficiency, (iv) conservation of natural resources, and (v) development of national administration to achieve good governance. Relating to mission (iii), the plan set a target to reduce the usage of petroleum in the transport sector. In accommodating the increase in traffic and hence relieving congestion along the highway project corridor, the project helped to reduce gasoline consumption.

Presently Thailand and its neighboring countries have been promoting regional economic cooperation through transport infrastructure development, particularly the development of the nine economic corridors: the North-South Corridor, the Northern Corridor, the Eastern Corridor, the East-West Corridor, the Southern Corridor, the Southern Coastal Corridor, the Central Corridor, the Northeastern Corridor, and the Northwestern Corridor, based on “the Greater Mekong Subregion (GMS) Economic Cooperation Program²” initiated by the Asian Development Bank (ADB), which considered the spillover effects of the nine corridors on industry and people's livelihood in the regions. Out of the nine corridors, six GMS economic corridors, the North-South Corridor, the East-West Corridor, the Southern Corridor, the Southern Coastal Corridor, the Northeastern Corridor, and the Northwestern Corridor are located in Thailand (see Figure 1). Since the project target section is part of the above mentioned GMS economic corridors, the project objective is in line with the international regional development policy. As of February 2009 the Second Phase of the Four-Lane Highway Widening Project had completed the four-laning of 1,601 km of road which is equal to about 30% of the target road length. The rest of the sections are still ongoing.

2.1.2 Consistency with Development Needs

At the time of appraisal, each target section, which had been a two-lane road, already had an average daily traffic volume of over 8,000 vehicles per day. This was taken as a rough indicator for upgrading roads from two-lane to four-lane, where traffic volume was also expected to increase continuously. Also, a mixture of large and small vehicles, including motorcycles, as well as high speed and low speed vehicles had adversely affected the traffic capacity and caused massive traffic jam during peak hours in the morning and evening. Therefore, the necessity for upgrading the existing two-lane roads to four-lane roads was high.

At the time of the ex-post evaluation, each target section functioned as one of the main national highways of each area, and after completion of the project, they have all continued to play an important role in regional economics and logistics. For example, the

² The target area of the program includes five nations and two provinces located in the Mekong River basin: Cambodia, Laos, Myanmar, Vietnam, Thailand and Yunnan Province and Guaxi Zhuang Autonomous Region in China.

Mukdahan-Nikhom Kham Soi section (NH212) is crucial for cross border trading between Thailand and Laos and Vietnam. There is also a development plan to make Khon Kaen a logistic center of North-Eastern Thailand (Isan region) in the near future, and the Nong Ruea-Khon Kaen-Yang Talat section (NH12 and NH209) will play an important role as a logistic route. Some of the target sections are part of the GMS Economic Corridors and it is expected that the traffic volume of the corridors will increase along with accelerated economic activities in the regions. Thus it is evaluated that project needs after the time of the ex-post evaluation continue to be high.

2.2 Efficiency (Rating: a)

Both project period and costs were as planned, therefore, efficiency of the project is high.

2.2.1 Outputs

The outputs of the project were the widening of the existing two-lane roads to four-lane roads for the main trunk highways in seven locations in the country, and these were implemented as planned. In addition, the four-laning of the following two sections (total 63.4km): the link to the Phitsanulok-Uttaradit section, the Wang Thong-Sak Lek section (38.1km) (NH11) and the Phitsanulok bypass road (25.3km) were added to the outputs (see Table 1 and Figure 2).

Table 1: Comparison of Planned and Actual Outputs

Planned Outputs (at Appraisal)	Actual Outputs (At Ex-Post Evaluation)
<p>(1) Four-laning of roads and bridges at the following sections:</p> <p>(NH11) Phitsanulok-Uttaradit..... 97.0km (NH12) Khon Kaen-Nong Ruea 36.0km (NH23) Ban Phai-Borabue..... 46.0km (NH209) Khon Kaen-Yang Talat 65.0km (NH212) Mukdahan-Nikhom Kham Soi ... 35.0km (NH401) Don Sak-Sichon..... 32.0km (NH403) Nakhon Si Thammarat-NH41 Junction 32.0km (Total).....<u>343.0km</u></p>	<p>(1) Four-laning of roads and bridges at the following sections:</p> <p>(NH11) Phitsanulok-Uttaradit 97.7km (NH12) Khon Kaen-Nong Ruea..... 47.2km (NH23) Ban Phai-Borabue 70.0km (NH209) Khon Kaen-Yang Talat 66.8km (NH212) Mukdahan-Nikhom Kham Soi ... 37.8km (NH401) Don Sak-Sichon 47.6km (NH403) Nakhon Si Thammarat-NH41 Junction 31.8km (Total).....<u>398.9km</u></p> <p><u>Additional Outputs</u> (NH11) Wang Thong-Sak Lek 38.1km (NH12) Phitsanulok bypass 25.3km (Total).....<u>63.4km</u></p> <p>(Grand total).....<u>462.3km</u></p>
<p>(2) Consulting services</p> <p>- Foreign consultants: 41 M/M - Local consultants: 112 M/M</p>	<p>(2) Consulting services</p> <p>- Foreign consultants: 62 M/M - Local consultants: 126 M/M</p>

These two additional sections were already in the list of the Second Phase of the Four-Lane Highway Widening Project as roads that needed to improve to four-lane during the period 2007-2011, and since their priority was relatively high, it was decided to conduct construction ahead of schedule. From the point of view of necessity, the distance of the following target sections were extended: 11.2km for the Khon Kaen-Nong Ruea section (NH12), 24km for the Ban Phai-Borabue section (NH23), and 15.6km for the Don Sak-Sichon section (NH401). The additional costs required for the above additional works were allocated from residual funds saved by the results of the competitive tender.

Because of the additional project outputs, additional work volumes of 21 M/M for foreign consultants and 14M/M for local consultants were added. It is considered that the above mentioned additional outputs were appropriate as they were in line with the road development plan, recognized priorities and were consistent with the objectives of this project.

2.2.2 Project period

The actual project period was 4 years and 7 months from July 2000 to January 2005 against a planned period of 4 years 5 months from January 2000 to May 2004, which was equal to 104% of the planned period (the project period was deemed to be from the start of detailed design to the end of consulting services). Considering that this project included the additional construction of extended sections, it can be said that the actual construction period was within its original schedule.

2.2.3 Project cost

The actual project cost was 22,752 million yen (of which the Japanese ODA loan was 17,068 million yen) against the planned cost of 26,058 million yen (of which the Japanese ODA loan was 19,544 million yen), which is equal to 87% of the planned cost and 87% of planned loan amount. This is because of the cost reduction effects of a competitive bidding which resulted in the lowering of actual construction costs. There was a low cost competition among the contractors who foresaw the order entry, as well as a decreased construction unit price due to lower prices for construction materials and wages since the currency crisis in Asia in 1997.

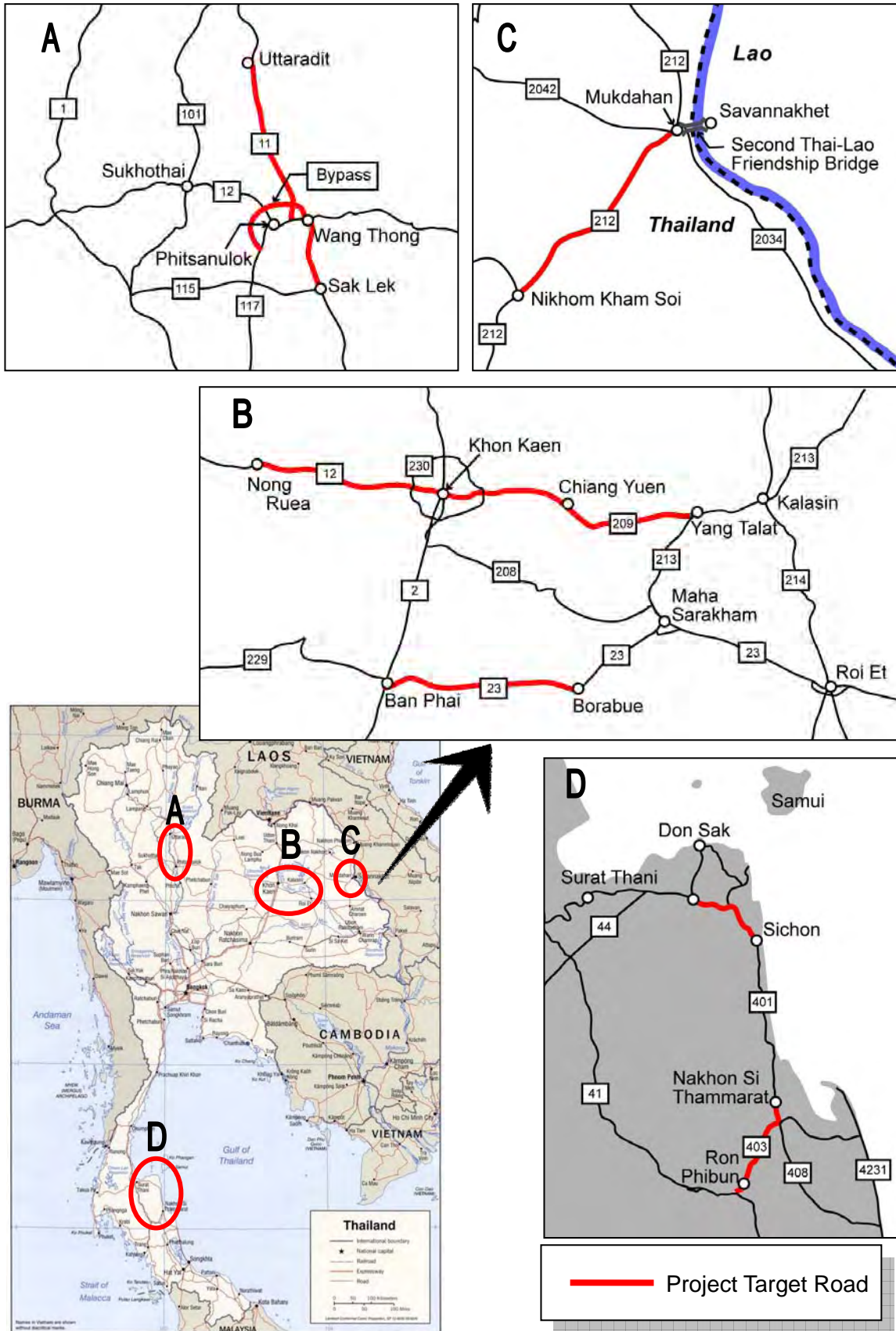


Figure 2: Map of Project Target Sections

2.3 Effectiveness (Rating: b)

Although reductions in travel time and increased velocity were observed, the target sections of this project have not achieved their target traffic volume. However, there have been some positive impacts such as smoother and more efficient commodity distribution, the promotion of the local economy and regional development, and the promotion of economic relations with neighboring countries. Therefore, this project has had certain effects, and its effectiveness is moderate.

2.3.1 Increase in Traffic Volume

Figure 3 shows the transition of the estimated and actual traffic volumes for the target sections of this project between 2000 and 2008 (for the estimated traffic volume, data between 2004 and 2008 is shown as it was the only available data). Data for the actual traffic volume after 2004 indicates that none of the target sections achieved its target. For example, in 2008, the actual achievement rate for each section was as follows: 37% for the Phitsanulok-Uttaradit section (NH11), 61% for the Khon Kaen-Nong Ruea section (NH12), 31% for the BanPhai-Borabue section (NH23), 44% for the Khon Kaen-Chiang Yuen section (NH209), 85% for the Chian Yuen-Yang Talat section (NH209), 56% for the Mukdahan-Nikhom Kham Soi section (NH212), 54% for the Don Sak-Sichon section (NH401), and 63% for the Nakhon Si Thammarat-NH41 Junction section (NH403). It should be noted that these target achievement rates were relatively high in 2004 and 2005 in many sections³, and then they started to decrease gradually. Each section has a unique transition in traffic volume when compared to the others, for example, the Khon Kaen-Yang Talat section on NH209 experienced a rapidly increased traffic volume in 2000 and 2001 then another rapid decline afterwards.

The reason for such phenomena is not clear from this ex-post evaluation, however, according to the Department of Highways (DOH), which is the executing agency of this project, they could be due to increased detour traffic to the four lane national highways that are next to the target sections as well as to escalating gasoline prices. Also another reason for such a low target achievement rate in traffic volume could possibly come from a somewhat optimistic estimate of traffic volume at the time of project planning⁴.

³ For example, 68-95% in 2004 for the three sections of Phitsanulok-Uttaradit (NH11), 77% in 2004 for the Khon Kaen-Nong Ruea section (NH12), 41% in 2005 for the BanPhai-Borabue section (NH23), 54% in 2005 for the Khon Kaen-Chiang Yuen section (NH209), 70% in 2005 for the Chian Yuen-Yang Talat section (NH209), 65% in 2005 for the Mukdahan-Nikhom Kham Soi section (NH212), 63% in 2004 for the Don Sak-Sichon section (NH401), and 81% in 2004 for the Nakhon Si Thammarat-NH41 Junction section (NH403).

⁴ The annual average growth rates in traffic volume between 2004 and 2008 for each target section, which were quoted from the traffic volume estimates used for the calculation of the internal rate of return (IRR) at appraisal were 14.6-17.4% for the three sections of Phitsanulok-Uttaradit (NH11), 5.5% for the Khon Kaen-Nong Ruea section (NH12), 10.9% for the BanPhai-Borabue section (NH23), 10.6% for the Khon Kaen-Chiang Yuen section

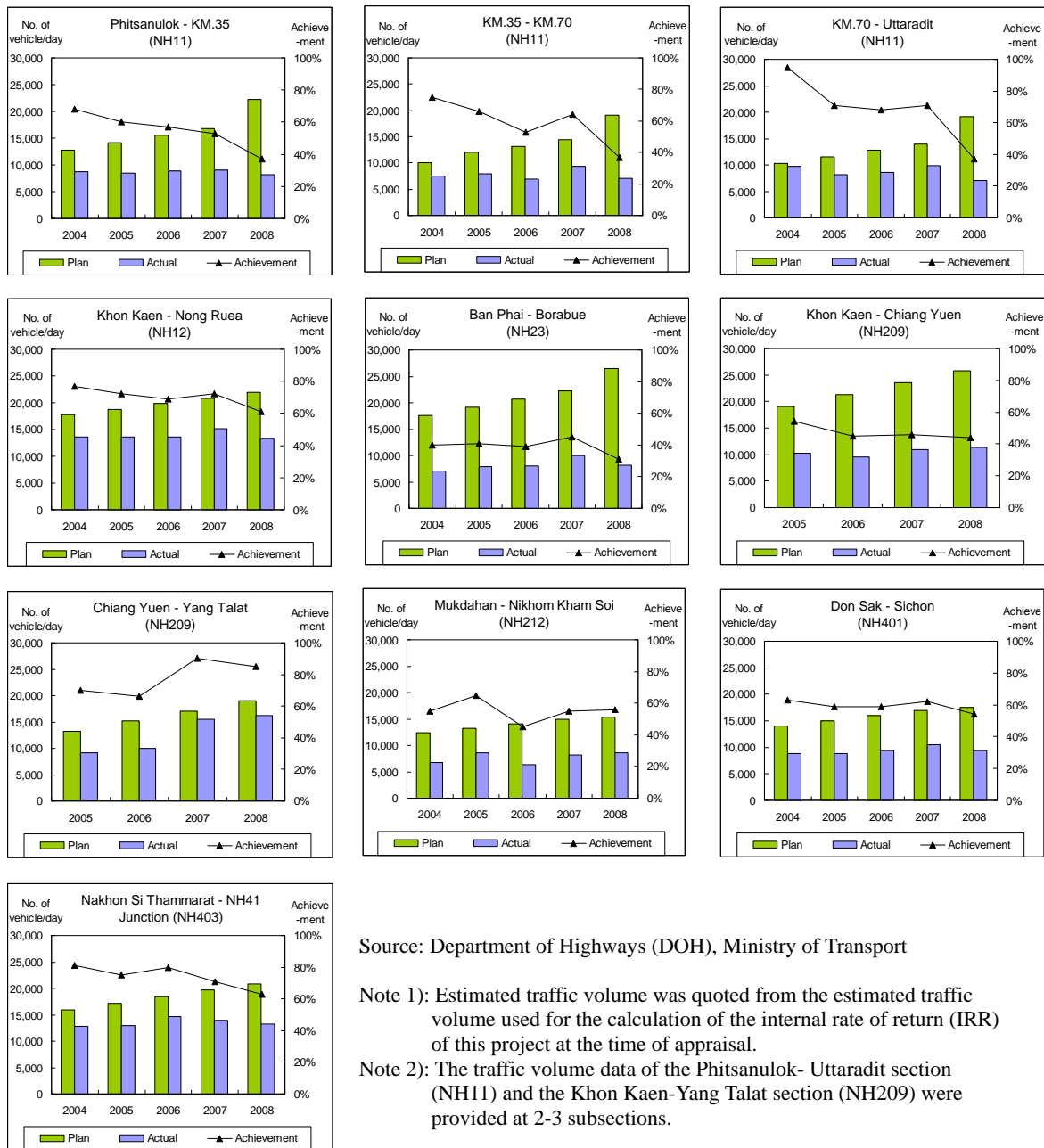


Figure 3: AADT of Project Target Sections

For the purpose of reference, this ex-post evaluation survey conducted a 24-hour sampling traffic count at the Khon Kaen-Chiang Yuen section (NH209) and the Don Sak-Sichon section (NH401). The result of the sampling traffic count is shown in Table 2, and it can be seen that there was no significant difference when comparing the traffic volume of the two sections in 2008, as shown in Figure 3.

(NH209), 12.8% for the Chian Yuen-Yang Talat section (NH209), 5.6% for the Mukdahan-Nikhom Kham Soi section (NH212), 5.6% for the Don Sak-Sichon section (NH401), and 7.1% for the Nakhon Si Thammarat-NH41 Junction section (NH403). The above mentioned annual average growth rates seem relatively high.

Table 2: Result of Sample Traffic Count

	Khon Kaen Province (North-East Thai)	Surat Thani Province (South Thai)
1. Date	April 2, 2009 (24 hours)	April 7, 2009 (24 hours)
2. Place	The Khon Kaen-Chiang Yuen section (National Highway 209)	The Dong Sak-Sichon section (National Highway 401)
3. Traffic Volume	9,331 vehicles/day	11,230 vehicles/day
4. Breakdown	Motorcycles: 775 (8.3%) Passenger cars: 6,095 (65.3%) Small/medium/large buses: 172 (1.8%) Small/medium/large trucks: 2,289 (24.5%)	Motorcycles: 2,397 (21.3%) Passenger cars: 5,939 (52.9%) Small/medium/large buses: 718 (6.4%) Small/medium/large trucks: 2,176 (19.4%)

Source: Ex-post evaluation survey team.

2.3.2 Savings in travelling time and improvement in velocity

After completion of the project, the travel time for all target sections was reduced to a quarter or half of what was originally seen. Velocity also improved by three times compared to the time before project implementation (See Table 3). Positive effects are clearly seen in travel time and velocity⁵, and this is also proven in the beneficiary survey (For the results of the beneficiary survey, see the “Summary Results of the Beneficiary Survey Conducted in this Ex-Post Evaluation” later in this report).

Table 3: Travelling Time and Velocity

NH	Section	km	Travelling time (minutes)		Velocity (km/hour)	
			Before	After	Before	After
11	Phitsanulok-Uttaradit	93.7	150	57	37.5	99
12	Khon Kaen-Nong Ruea	47.2	120	32	24	89
23	Ban Phai-Borabue	70.0	90	47	47	89
209	Khon Kaen-Chiang Yuen-Yang Talat	66.8	90~120	45	25~34	70
212	Mukdahan-Nikhom Kham Soi	37.8	60	20~28	38	81~113
401	Don Sak-Sichon	47.6	40~60	30~35	48~71	82~95
403	Nakhon Si Thammarat-NH41 Junction	31.8	90	30	21	64

Source: Department of Highways (DOH), Ministry of Transport

Note: The travelling time for each target section after project completion is based upon the results of the survey in 2006/2007 conducted by DOH except the Nakhon Si Thammarat-NH41 Junction section. On the other hand, the travelling time before project implementation is based upon the results of the interview survey for the Bureau of Highways and the Highway Districts of DOH which are in charge of operation and maintenance of each target section. The velocity for each target section before and after project implementation is calculated on the basis of the above motioned travelling time.

2.3.3 Results for the Economic Internal Rate of Return (EIRR)

Table 4 shows a comparison of the Economic Internal Rate of Return (EIRR) for each target section based upon cost-benefit analyses at appraisal and ex-post evaluation. The

⁵ According to the Land Transport and Highway Acts of Thailand, the legal speed limit for national highways in non-built up areas is 90 km/h. However, in fact, it is often observed the vehicles exceeding the legal speed limit in the target section due to relatively low traffic volume, wide road width and good road surface condition after project implementation.

results of the EIRR at ex-post evaluation are taken from the results of the recalculation of EIRR conducted by the Department of Highways (DOH), the executing agency of this project, using the same preconditions as at appraisal⁶. One of the main factors for the re-calculated EIRR figure being lower when compared to the appraisal, with the exception of the Khon Kaen- Yang Talat section (NH209), could be that the actual traffic volume growth was rather slower than estimated.

Table 4: Results of the Economic Rate of Return (EIRR)

NH	Section	EIRR	
		Planned (2000)	Actual (2008)
11	Phitsanulok-Uttaradit	31.7%	17.8%
12	Khon Kaen-Nong Ruea	31.3%	26.6%
23	Ban Phai-Borabue	54.9%	39.4%
209	Khon Kaen-Chiang Yuen-Yang Talat	38.9%	44.4%
212	Mukdahan-Nikhom Kham Soi	32.9%	15.1%
401	Don Sak-Sichon	26.7%	13.1%
403	Nakhon Si Thammarat-NH41 Junction	30.2%	19.9%

Source: Project Completion Report (PCR) prepared by the Department of Highways (DOH) in September 2009.

2.3.4 Satisfaction level of the project beneficiaries

In this ex-post evaluation, a beneficiary survey was conducted targeting local residents as well as local transporters and businesses in Khon Kaen Province in the North-East of Thailand and Surat Thani Province in the South of Thailand. According to the results of a satisfaction survey as shown in Table 5, 54% of respondents (122 respondents) answered that they were “very much satisfied”, 40% of respondents (90 respondents) were “satisfied to some extent”, and 6% of respondents (13 respondents) were “not much satisfied” as seen in Table 6. Overall, more than 90% of respondents were either “very much satisfied” or “satisfied to some extent” and thus it can be said that this project has met the needs of the beneficiaries.

Table 5: Satisfaction Level of Beneficiaries

	Khon Kaen Province (North-East Thai)			Surat Thani Province (South Thai)			Total	%
	Residents	Trans- porters	Businesses	Residents	Trans- porters	Businesses		
Very much satisfied	13	28	10	21	25	25	122	54%
Satisfied to some extent	7	6	28	9	20	20	90	40%
Not much satisfied	1	6	3	1	1	1	13	6%
Not satisfied at all	0	0	0	0	0	0	0	0%
Do not know	0	0	0	0	0	0	0	0%
Total	21	40	41	31	46	46	225	100%

Source: The results of the beneficiary survey conducted by the ex-post evaluation team.

⁶ The preconditions of the cost-benefit analysis of this project are: (i) cost: project cost and operation and maintenance cost, (ii) benefit: saving of operation cost for vehicles, time saving cost, and saving of traffic accident cost, and (iii) project life: 20 years after project completion.



The Phitsanulok-Uttaradit section (NH11)



The Khon Kaen-Nong Ruea section (NH12)



The Ban Phai-Borabue section (NH23)



The Mukdahan-Nikhom Kham Soi section (NH212)



The Don Sak-Sichon section (NH401)



The Nakhon Si Thammarat-NH41 Junction section (NH403)

Photographs of the project target sections

2.4 Impact

2.4.1 Impact on smooth and efficient passenger and cargo transport

As already described in 2.3.2 *Savings in travelling time and the improvement of velocity*, time reduction and an average speed increase were attained after the completion of the project. As a case study for this ex-post evaluation, a beneficiary survey and interviews with stakeholders were conducted in Khon Kaen Province, Maha Sarakam Province, and Kalasing Province in North-Eastern Thailand (Isan region) where three of the target sections are located: the Khon Kaen-Nong Ruea section (NH12), the Ban Phai-Borabue section (NH23), and the Khon Kaen-Yang Talat section (NH209), as well as in Surat Thani Province and Nakhon Si Thammarat Province in Southern Thailand where two of the target sections are located: the Don Sak-Sichon section (NH401) and the Nakhon Si Thammarat-NH41 Junction section (NH403).

The main industry of the Isan region, which includes Khon Kaen Province, is agriculture, and according to the Khon Kaen Province Road Transport Office, the transportation route between farms and processing plants has become smoother since the completion of the project, and convenience has improved when residents bring their products to market. This is because Khon Kaen city is located at the junction of the East-West Corridor and the Northeastern Corridor that travel to Da Nang in Vietnam from Mawlamyain in Myanmar through Thailand and Laos, and travel to Vientiane in Laos from Bangkok, respectively.

Khon Kaen Province will take advantage of its convenient location, and aims to be the future commodity distributions center for the Isan region. For this purpose, it is imperative that there is a four-lane road that is more appropriate for large transportation vehicles, and it can be said that this project has played an important role in implementing such a plan.

The Don Sak-Sichon section and the Nakhon Si Thammarat-NH41 Junction section are used as a route for tourism transportation and the transportation of agricultural products in addition to the road's important role as the regional arterial highway connecting Surat Thani and Nakhon Si Thammarat. For example, approximately 1,800 vehicles use ferries from the two ferry ports in Don Sak to go to Samui Island, which is one of the well known beach resorts in Thailand, and some of them use this project road. In Southern Thailand, which includes Surat Thani Province and Nakhon Si Thammarat Province, but in the coastal areas near Nakhon Si Thammarat Province in particular, there are plans for oil refinery plants for the underwater oilfield as part of the Thailand Bay and Port Development Plan, and there is a possibility of regional development promotion. There is also a new beach resort development plan for the coastal areas. These coastal areas of Southern Thailand possess the potential for port, industrial and tourism development and it is most likely that this project will contribute to streamlining local commodity distribution.

2.4.2 Impact on the local economy and regional development

The Gross Regional Domestic Product (GRDP), the agricultural output and the industrial output in the eight provinces where the target sections are located have had marked growth between 2000 and 2007 (see Table 6). Regarding the numbers of registered companies and factories along the target sections in the eight provinces, there has been some growth in all provinces after project implementation except for Kalasin (See Table 7 and 8). Between 2005 to 2008, when the project was completed, the number of registered companies increased by 1958 in Surat Thani, and 588 in Khon Kaen; the number of factories along the target sections increased by 214 in Khon Kaen followed by 107 in Phitsanulok. According to an interview survey with the Provincial Industrial Office in Khon Kaen, which is under the Ministry of Industry, contributing factors in the increase in factories in Khon Kaen were cheaper labor due to large population and its geographical position as a nuclear city located at the junction of the East-West Corridor and the Northeastern Corridor. As described in *2.4.1 Impact on smooth and efficient passenger and cargo transport*, there is the potential for ports, industrial complexes and tourism development in the Southern coastal region of Thailand.

The increase in new business activities and the expansion of business opportunities were also recognized as positive changes in the beneficiary survey in Khon Kaen and Surat Thani.

After project implementation, there were the positive economic effects along the target sections as described above as well as possibilities for local development in the future, thus it is considered that this project plays in important role in supporting the development of its target areas.

Table 6: Major Economic Indicators in the Target Provinces (Constant Price)

(Unit: million Bahts)

Province	GRDP			Investment in Manufacturing			Manufacturing Output			Agricultural Output		
	2000	2007	Growth rate	2000	2007	Growth rate	2000	2007	Growth rate	2000	2007	Growth rate
Phitsanulok	35,175	54,769	6.5%	5,355	8,583	7.0%	5,507	4,862	-1.8%	6,979	13,932	10.4%
Uttaradit	15,545	26,900	8.1%	5,501	7,048	3.6%	1,741	3,577	10.8%	3,161	7,956	14.1%
Khon Kaen	66,375	127,089	9.7%	49,828	73,280	5.7%	18,375	46,262	14.1%	6,778	14,829	11.8%
Kalasin	20,080	38,368	9.7%	2,762	3,698	4.3%	2,604	5,458	11.2%	3,623	9,649	15.0%
Maha Sarakham	19,918	33,983	7.9%	1,320	6,384	25.3%	1,798	3,852	11.5%	3,689	6,749	9.0%
Mukdahan	7,968	12,970	7.2%	3,302	4,719	5.2%	918	1,507	7.3%	1,324	2,953	12.1%
Surat Thani	52,825	120,749	12.5%	18,315	26,875	5.6%	8,616	19,972	12.8%	14,111	43,807	17.6%
Nakhon Si Thammarat	74,743	122,764	7.3%	26,094	31,308	2.6%	9,055	14,690	7.2%	19,444	33,163	7.9%

Source: Thai Statistics Bureau.

Note: The growth rate represents an annual average growth rate of 7 years between 2000 and 2007.

Table 7: Number of Registered Companies in the Target Provinces

Province	Phitsanu- lok (Population)	Uttaradig (463,000)	Khon Kaen (1,756,000)	Kalasin (978,000)	Maha Sarakham (937,000)	Mukdahan (336,000)	Surat Thani (984,000)	Nakhon Si Thammarat (1,514,000)
Target section	(1) (8) (9)		(2) (3) (4)			(5)	(6) (7)	
2002	130	n.a.	4,400	n.a.	n.a.	55	9,614	n.a.
2003	184	1,005	4,644	n.a.	n.a.	66	10,959	n.a.
2004	167	1,134	4,872	n.a.	n.a.	47	6,952	n.a.
2005	174	1,067	5,068	n.a.	n.a.	73	8,341	n.a.
2006	169	1,148	5,251	94	88	67	9,549	250
2007	176	1,231	5,444	71	114	67	9,280	229
2008	189	1,229	5,656	79	117	74	10,299	267
Change in 2005~2008	+15	+162	+588	-15	+29	+1	+1,958	+17

Source: Provincial Business Development Office of each province under the Ministry of Commerce.

Note 1): The number of registered companies between 2006 and 2008 is not available for the three provinces of Kalasin, Mahasarakham and NakhonSi Thammarat.

Note 2): (1) the Phitsanulok-Uttaradit section (NH11), (2) the Khon Kaen-Nong Ruea section (NH12), (3) the Ban Phai-Borabue section (NH23), (4) the Khon Kaen-Yang Talat section (NH209), (5) the Mukdahan-Nikhom Kham Soi section (NH212), (6) the Don Sak-Sichon section (NH401), (7) the Nakhon Si Thammarat-NH41 Junction section (NH403), (8) Phitsanulok city road (KM 0-4) and the Wang Thong-Sak Lek section (NH11), and (9) the Phitsanulok bypass (NH12).

Table 8: Number of Factories in the Target Province (Newly registered companies for each year)

Province (Population)	Phitsanu -lok (843,000)	Uttaradig (463,000)	Khon Kaen (1,756,000)	Kalasin (978,000)	Maha Sarakhm (937,000)	Mukdahan (336,000)	Surat Thani (984,000)	Nakhon Si Thammarat (1,514,000)
Target section	(1) (8) (9)		(2) (3) (4)			(5)	(6) (7)	
unitl 2000*	588	185	1,690	760	728	177	25	343
2001	29	8	25	17	7	2	2	3
2002	33	9	28	18	15	8	8	10
2003	26	14	19	14	25	11	5	12
2004	31	14	35	9	25	34	7	14
2005	27	12	55	14	6	7	4	21
2006	15	26	55	9	13	18	8	14
2007	24	5	55	19	16	15	9	16
2008	41	15	49	14	19	6	3	18
Total	814	288	2,011	874	854	278	71	451
Change in 2005~2008	+107	+58	+214	+56	+54	+46	+24	+69

Source: Provincial Industrial Office of each province under the Ministry of Industry.

Note 1): The names of the target section (1)-(8) are same as in Table 7.

Note 2): *Accumulated numbers until 2000. After 2001 the number of newly registered factories is provided.

Note 3): The number of registered factories in Table 9 does not represent that of each province as a whole but that of the respective districts where each target section is located. These districts are: (a) Mueang Phitsanulok district, Phrom Phiram district, Wat Bot district and Wang Thong district in Pitsanulok Province, (b) Mueang Uttaradit district, Tron district and Phichai district in Uttaradit Province, (c) Mueang Khon Kaen district, Ban Fang district, Nong Rhuea district, and Ban Phai district in Khon Kaen Province, (d) Mueang Kalasin district and Yang Talat district in Kalasing Province, (e) Mueang Maha Sarakhm district, Chiang Yuen district and Borabue district in Maha Sarakhm Province, (f) Mueang Mukdahan district and Nikhom Kam Soi district in Mukdahan Province, (g) Don Sak district in Surat Thani Prvince, and (h) Mueang Nakhon Si Thammarat district and Ron Phibun district in Nakhon Si Thammarat Province.

2.4.3 Impact on the promotion of economic relations with neighboring counters

Thailand has been actively expanding international trade with Myanmar, Laos and Vietnam over the years. By 2008, border trade had expanded to 98.3% of total trade (see Table 9). Since the railroad system is undeveloped in Thailand, the primary means of transportation in international trading is the land transportation, and so the East-West Corridor and the South-North Corridor play an important role. The trading that goes through Mukdahan, which is the starting point of the Mukdahan-Nikhom Kham Soi section (NH212), has expanded with exports from Thailand to Laos or to other third countries through Laos following the completion of the Second Mekong International Bridge⁷ (See Table 10). For this reason, it is considered that the project has contributed to the promotion of economic relations with neighboring counters.

⁷ Constructed by the Japanese ODA loan project "Second Mekong International Bridge Construction Project" with operations starting in December 2006.

Table 9: Trade between Thailand and Laos

(Unit: million Bahts)

	2005	2006		2007		2008	
a) Entire trade		(vs 2005)		(vs 2006)		(vs 2007)	
1. Total	40,090	58,473	45.9%	61,480	5.1%	78,828	28.2%
Export	30,965	38,720	25.0%	45,185	16.7%	58,391	29.2%
Import	9,125	19,753	116.5%	16,295	-17.5%	20,437	25.4%
2. Balance	21,840	18,967	-13.2%	28,890	52.3%	37,954	31.4%
b) Border trade							
1.Total	36,611	46,432	26.8%	51,880	11.7%	77,521	49.4%
(b/a)	(91.3%)	(79.4%)		(84.4%)		(98.3%)	
Export	29,844	35,494	18.9%	41,602	17.2%	56,029	34.7%
Import	6,767	10,938	61.6%	10,278	-6.0%	21,492	109.1%
2. Balance	23,077	24,556	6.4%	31,324	27.6%	34,537	10.3%

Source: Thai Customs.

Table 10: Volume of Trade via Mukdahan Customs

(Unit: million Bahts)

	Export	Import	Balance
2004	552.51	4,653.22	4,127.71
2005 (vs 2004)	854.98 (54.7%)	5,721.26 (23.0%)	4,821.87
2006 (vs 2005)	2,318.96 (171.2%)	6,140.82 (7.3%)	3,821.87
2007 (vs 2006)	9,604.94 (314.2%)	6,145.04 (0.07%)	-3,459.91

Source: Thai Customs.

2.4.4 Improvements in the living standards of local residents

According to the results of the beneficiary survey for local businesses and transporters, the expansion of business activities, the increase in business opportunities, the increase in job opportunities and the improvement in access to various services such as medical services, health care and schools were perceived as positive changes after project implementation. Another beneficiary survey for local residents in Khon Kaen revealed that community expansion and prosperity were recognized as major changes. It is considered that to some extent the project has contributed to the improvement of the living standards of local residents.

2.4.5 Impact on traffic accidents

Table 11 shows the number of traffic accidents and fatalities within the target sections during 2000 and 2007. They all shared the same trend of a decreasing number of traffic

accidents and fatalities from 2001 to 2002, which then increased and reached its peak in 2005 before starting to decrease again after 2006. According to the Department of Highways (DOH) of the Ministry of Transport, the intensive traffic safety campaign under the administration of former Prime Minister Taksin was the main cause of the decrease in the number of accidents and fatalities between 2001 and 2002. The reason why the number of traffic accidents and fatalities vary from year to year is because it is common not to report accidents to the police unless they are major fatal accidents, and those involved often organize compensation among themselves. In some cases even the police do not keep records of minor accidents, and the DOH suggests the possibility of a gap between the actual number of accidents and the ones on record. The primary cause of traffic accidents is speeding⁸. Since there is only limited data on the causal correlation between the number of traffic accidents and this project however, it is difficult to make a clear judgment in this ex-post evaluation.

The DOH has been taking measures for traffic accident prevention such as the installation of more traffic lights, street lights and reflective plates and it has also made some changes in road design such as reducing U-turn points as well as the promotion of traffic safety campaigns with local governments and police authorities.

Table 11: Number of Traffic Accidents and Fatalities

NH	Section		2000	2001	2002	2003	2004	2005	2006	2007
11	Phitsanulok-Uttaradit	No. Accidents	37	23	22	15	46	49	33	23
		Fatalities	18	1	4	2	14	4	5	2
12	Khon Kaen-Nong Ruea	No. Accidents	23	11	5	19	49	32	4	9
		Fatalities	8	-	3	5	8	8	-	2
23	Ban Phai-Borabue	No. Accidents	6	5	7	12	17	60	30	20
		Fatalities	-	2	2	2	11	14	6	4
209	Khon Kaen-Yang Talat	No. Accidents	1	2	-	-	7	43	25	20
		Fatalities	-	2	-	-	-	6	10	10
212	Mukdahan-Nikhom Kham Soi	No. Accidents	1	5	3	3	11	14	5	8
		Fatalities	-	1	3	-	8	2	1	2
401	Don Sak-Sichon	No. Accidents	4	3	7	2	8	6	5	6
		Fatalities	1	-	5	3	1	4	-	1
403	Nakhon Si Thammarat - NH41 Junction	No. Accidents	35	33	4	3	7	16	22	14
		Fatalities	1	4	1	-	2	-	1	1

Source: Department of Highways (DOH), Ministry of Transport

⁸ According to the statistics, 86% of traffic accidents in Thailand as a whole are caused by speeding (source: Traffic Accidents on National Highways 2007, Bureau of Highway Safety, Department of Highways, Ministry of Transport, Thailand).

2.4.6 Impact on the natural environment

According to the beneficiary survey for local transporters and businesses in the ex-post evaluation survey, 53% of respondents answered that there had been environmental impacts (of which 16% of the respondents replied “very much” and 37% replied “to some extent”). The perceptions of the above respondents of the dimensions of the environmental impact were: “increase in air pollution (72%)”, “increase in noise (79%)” and “increase in vibration (68%)” after project implementation. However, as environmental data was not collected in the project area, an analysis of whether the actual data surpasses environmental standards is not available. Due to the lack of objective data, the beneficiaries’ opinion cannot be verified.

2.4.7 Impact on the social environment associated with the resettlement of residents and land acquisition

Since all the necessary land acquisitions were completed upon the construction of the existing two-lane roads, there was no need for further land acquisition and relocation of residents for this project.

Summary Results of the Beneficiary Survey Conducted in this Ex-Post Evaluation

In the ex-post evaluation of the “Regional Road Improvement Project (III)”, a questionnaire survey and group interviews (Focus Group Discussions) with beneficiaries were carried out. A summary of the results of the beneficiary survey is as follows.

<Focus group discussion with local residents living along the project target road>

- (1) Place: Khon Kaen and Surat Thani
- (2) Time: April 2009
- (3) Target group: Local residents living along the target section in Khon Kaen and Surat Thani
- (4) No. of samples: 21 (20 male and 1 female) in Khon Kaen
31 (21 male and 10 female) in Surat Thani Total: 52

(5) Top Six “Changes” that Participants Consider Most Important

Response in Khon Kaen (N=21)	No. of Votes	Response in Surat Thani (N=31)	No. of Votes
1. Increase in convenience when travelling	26	1. Faster travel than before (i.e. increase in convenience when travelling)	21
2. Community expansion and prosperity	10	2. Increase in traffic accidents	17
3. Serious traffic accidents	8	3. Travelling within the community became less convenient	16
4. Visiting neighbors on both sides of the road became less convenient	8	4. Improvement in safety when travelling	11
5. Improvement in safety when travelling	4	5. Savings in travelling time and vehicle operation costs	9
6. Improvement in landscape	4	6. Difficulty in crossing the road	4
7. Increase in floods in the community	4		

Note : At first, all the participants discussed the key question, “How has the project changed your life?” Major common changes were extracted through group discussion. Then each participant, each having three votes, was asked to allocate their votes to the “changes” that they thought most important.

(6) Results of Analysis

- The results of focus group in Khon Kaen and Surat Thani show a common tendency.
- Positive changes in socio-economic aspects such as the increase in convenience, the improvement of safety when travelling and prosperity were recognized.
- At the same time, negative impacts such as the increase in traffic accidents and serious traffic accidents were also perceived. Also many residents felt that travelling within the community had become less convenient because they were now obliged to go a long way round when visiting neighbors due to the widening of roads and the installation of center dividers and fences by the project.



FG in Khon Kaen



FG in Surat Thani



Voting

<Questionnaire survey for local businesses and transporters >

- (1) Place: Khon Kaen and Surat Thani
- (2) Time: April 2009
- (3) Target group: Local businesses and transporters
- (4) No. of samples: 64 transporters (Khon Kaen: 40, Surat Thani: 24)
87 businesses (Khon Kaen: 41, Surat Thani: 46) Total: 151

(5) Results of Analysis

- 97.6% of businesses in Khon Kaen and 97.8% of businesses in Surat Thani perceived an increase in the convenience of traffic after project implementation. Major reasons for this answer were: increase in comfort (75.6% in Khon Kaen, 78.3% in Surat Thani), savings in travelling time (41.5% in Khon Kaen, 41.5% in Surat Thani), decrease in traffic accidents (31.7% in Khon Kaen, 31.7% in Surat Thani) and so on.
- 95.1% of businesses in Khon Kaen and 93.5% of businesses in Surat Thani recognized the socio-economic impacts of the project. In Khon Kaen these were: increase in population (82.9%), change in land use (61.0%), increase in new business activities (48.8%), increase in accessibility to a variety of services (43.9%) and so on. In Surat Thani, positive impacts that were perceived were: increase in new business activities (58.7%), increase in accessibility to a variety of services (56.5%), increase in business opportunities (54.3%), increase in land price (54.3%), increase in population (54.3%), change in land use (54.3%), increase in job opportunities (52.2%) and so on. (*population means a population in the community of the respondent)
- 97.5% of transporters in Khon Kaen and 95.8% of transporters in Surat Thani recognized an increase in traffic volume after project implementation.
- 65% of transporters in Khon Kaen and 54.1% of transporters in Surat Thani perceived a saving in travelling time after project implementation
- 67.5% of transporters in Khon Kaen and 66.7% of transporters in Surat Thani replied that there was no change in the frequency of transport services, but 75% of transporters in Khon Kaen and 75% of transporters in Surat Thani answered that the number of passengers had decreased after project implementation. It is assumed that an increase in the use of private cars led to the decrease in the use of public transport services.
- 77.5% of transporters in Khon Kaen thought that the number of traffic accidents had increased. They analyzed the causes of traffic accidents as: ignorance of traffic rules on the part of road users (57.5%), carelessness of road users (20%), increase in traffic volume (2.5%) and so on. On the other hand, 41.7% of transporters in Surat Thani answered that the number of traffic accidents had increased, but 41.7% of transporters in Surat Thani replied that the number of traffic accidents had declined. There was a difference between Khon Kane and Surat Thani in their perception of the impact of traffic accidents. This difference may be linked with the difference in the conditions of the two provinces such as size of population, degree of development along the target sections, and the level of road network development.
- As for the effects of development along the target sections, 40% of Khon Kaen transporters and 29.2% of Surat Thani transporters pointed out commercial development, 20.8% of Khon Kaen transporters and 15% of Surat Thani transporters mentioned the expansion of the community.

<Opinions and recommendation for the project from beneficiaries>

- A major opinion commonly expressed by local residents, businesses, and transporters was the necessity for the installation of fly-overs, traffic lights, and street lights along the project target road for the prevention of traffic accidents. Also, the necessity for better periodic maintenance of roads and bridges was suggested.



Interview survey with a local transporter in Khon Kaen.



Interview survey with a local business in Khon Kaen.



Interview survey with a local business in Surat Thani.

2.5 Sustainability (Rating: a)

No major problem has been observed in the capacity of the executing agency nor its operation and maintenance (O&M) systems; therefore, the sustainability of the project is high.

2.5.1 Executing Agency

2.5.1.1 Structural Aspects of Operation and Maintenance (O&M)

The executing agency for operation and maintenance (O&M) of the project is the Department of Highways (DOH), Ministry of Transport. DOH is responsible for the planning, construction, and O&M of all national roads and some motorways in Thailand. The total length of roads under the management of DOH is 51,537km, which is 27% of the entire total length of domestic roads. DOH possessed 31,000 employees as of December 2008. In addition to the operation and maintenance of roads, DOH is also responsible for collecting tolls and these duties are carried out by the DOH Bureau of Highways (15 branches nationwide) and the Highway Districts and Highway Maintenance District Offices (104 branches nationwide). In general, approximately 20 government employees and 200 staff are assigned to each local Highway District. Figure 4 shows the organizational chart of DOH. It can be concluded that there is no problem in O&M systems because managerial responsibilities for O&M are clear.

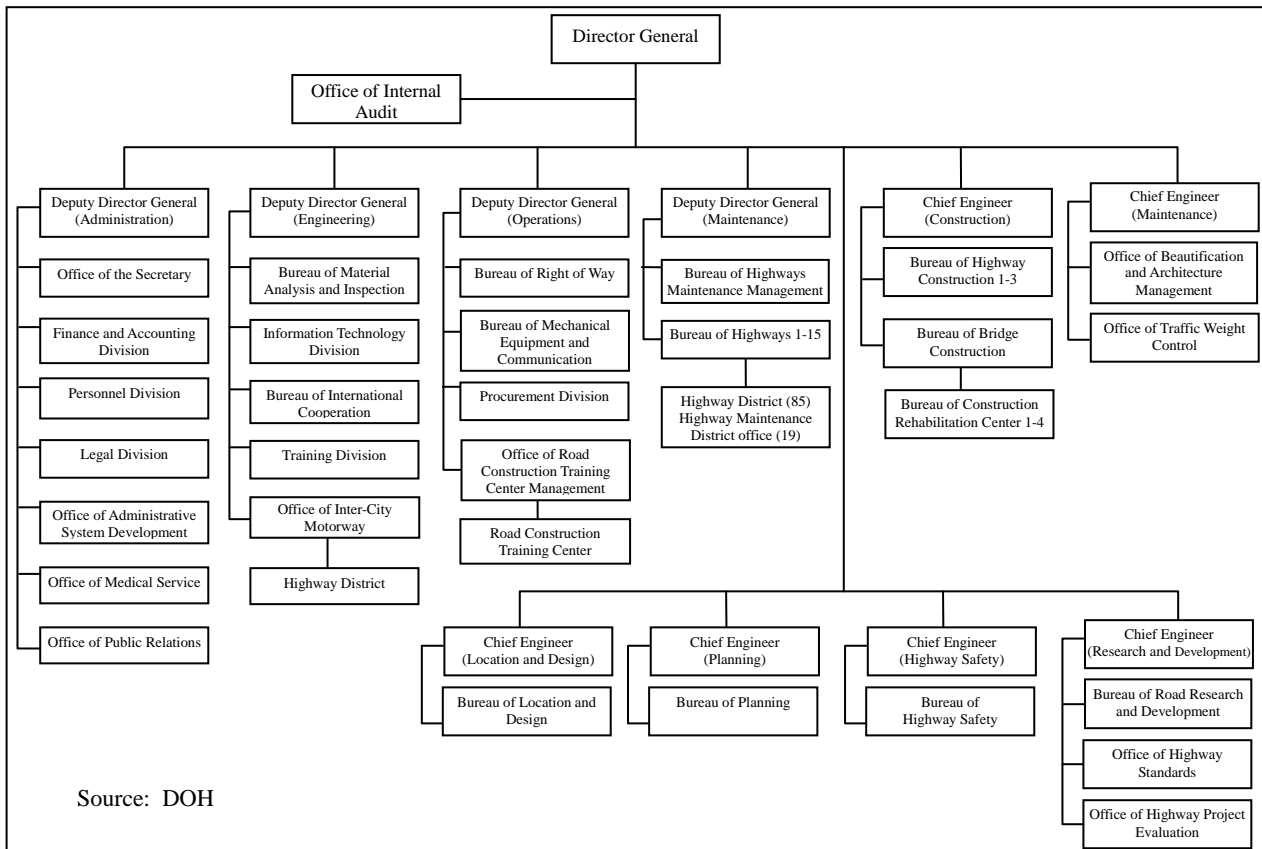


Figure 4: Organizational Chart of the Department of Highways (DOH), Ministry of Transport

2.5.1.2 Technical Aspects of Operation and Maintenance

The DOH conducts routine maintenance, periodical maintenance, special maintenance and emergency maintenance using the DOH manual which is based on the American Association of State Highway and Transportation Officials (AASHTO) ⁹. The DOH training department (under the technical department) provides 50 training courses (in various areas) annually, including operation and maintenance training in order to improve the skills of employees. The DOH has been using Highway Development & Management-4 (HDM-4) ¹⁰ developed by the World Bank, however, it is now planning to introduce the Pavement Management System (PMS), an original system developed by DOH based upon the current HDM-4, to all Bureau of Highways, Highway Districts and Highway Maintenance Districts by 2009. No problems are observed in the technical capacity for operation and maintenance.

2.5.1.3 Financial Aspects of Operation and Maintenance

The O&M cost for the project target sections is allocated from the central government's general budget¹¹. Table 12 shows the O&M budget of the project target sections which account for approximately 30% of the entire DOH budget¹². Interviews with the Bureau of Highways and Highway Districts have revealed that some feel that the O&M budget is not sufficient. However, on the other hand, others state that the DOH headquarters preferentially distributes its limited budget to O&M for all main arterial roads including the target sections of the project¹³. Based upon the evaluator's impression after driving approximately 2,000km on the national trunk highways in Thailand, including the project target sections, during the ex-post evaluation survey, the overall O&M condition of the national highways in Thailand were satisfactory, and standards were relatively high when compared to other Asian countries. Therefore it is concluded that there is no problem observed in the financial status for operation and maintenance for the project.

⁹ The main activities of routine maintenance are the cleaning of roads, hard shoulders and drainage, the repair of minor damage such as pot holes, the checking of traffic lights, and the conservation of plants. The main activities of periodic maintenance are the re-sealing of the road surface 3 years after completion and over-lay 7 years after completion. Emergency maintenance includes large-scale maintenance activity such as disaster rehabilitation which is not covered by routine and periodic maintenance.

¹⁰ HDM-4 (Highway Development & Management-4) is a pavement maintenance support software developed by the World Bank, which is currently used in about 100 countries in the world. At present DOH has purchased four licenses of this software, and the operation of HDM-4 is only available in the DOH headquarters.

¹¹ Toll fees collected from national highways and motorways under the management of DOH go directly to the Treasury. The O&M budget for DOH is allocated from the central government as a part of general budget for DOH every year.

¹² A breakdown of the O&M budget consists of routine maintenance (40%), periodic maintenance and special maintenance (50%) and emergency maintenance (10%).

¹³ Priority of budget allocation is determined by three criteria; (i) road condition, (ii) length of road and (iii) population along the road section.

Table 12: Operation and Maintenance Budget

(Unit; 1,000 Bahts)

	2007	2008	2009
Project target sections			
1) Routine maintenance	40,437	44,624	44,965
2) Periodic and special maintenance	50,877	23,025	45,050
Total	91,316	67,649	90,015
Total O&M budget in DOH	12,292,470	12,292,470	13,617,880
Total DOH Budget	40,164,870	34,883,460	40,546,760

Source: Department of Highways (DOH), Ministry of Transport

Note: The O&M budgets in 2007-2008 are actual and that in 2009 is estimates.

2.5.2 Current Status of Operation and Maintenance

Currently, O&M remains relatively simple with such routine measures as grass cutting, painting or cleaning of hard shoulders as it has been only few years since the completion of this project and the pavement condition is still good. Table 13 shows the International Roughness Index (IRI) which measures the flatness of the road. DOH sets an IRI figure of 3.5 as the indicator for pavement repair. The IRI figures for all of the target sections are below 3.5 and therefore it is clear that they are all maintained in optimal condition.

Table 13: International Roughness Index (IRI)

NH	Section	IRI	
		2000	2008
11	Phitsanulok-Uttaradit	2.22	1.94
12	Khon Kaen-Nong Ruea	2.58	2.25
23	Ban Phai-Borabue	2.70	1.99
209	Khon Kaen-Chiang Yuen-Yang Talat	2.57	2.48
212	Mukdahan-Nikhom Kham Soi	2.55	2.16
401	Don Sak-Sichon	2.35	2.01
403	Nakhon Si Thammarat-NH41 Junction	2.50	2.42

Source: Department of Highways (DOH), Ministry of Transport.

In general, damage to the pavement caused by overloaded vehicles is one of the main causes of road damage, and therefore DOH has set up weighting stations throughout the main national highways to control overloaded vehicles¹⁴. There are weighting stations in the project target sections at Uttaradit (NH11) and Yang Talat (NH209). At present, there is no problem reported on the operation and maintenance status.



Weighting Stations installed near Don Sak Junction on NH401

¹⁴ Overloaded vehicles which violate laws and regulations are fined and required to unload excess loads.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

The relevance of the project is high due to the high consistency between the project objective and Thailand's and the Mekong region's development policy and needs, and the efficiency of the project is also judged to be high as the project outputs, project period and project costs materialized as planned. On the other hand, although expected project effects such as savings in travelling time and an increase in velocity were observed after project implementation, the increase in traffic volume has not reached its target so far. The impacts on smooth and efficient passenger and cargo transport, on the local economy and regional development, and on the promotion of economic relations with neighboring countries were recognized. The sustainability of this project is high in terms of the O&M system, technology, and finance by the executing agency as the roads improved by the project are maintained in good condition. In light of the above, this project is evaluated to be highly satisfactory.

3.2 Lessons learned

None

3.3 Recommendations

In order to maintain the sustainability of this project, it is recommended that DOH utilize their own PMS as planned to be introduced in 2009, and establish and implement a more effective operation and maintenance system including the efficient distribution of the O&M budget.

Comparison of Original and Actual Scope

Item	Original	Actual
(1) Outputs		
a) Four-laning of the roads and bridges in the following sections:	(NH11) Phitsanulok-Uttaradit: 97.0km (NH12) Khon Kaen-Nong Ruea: 36.0km (NH23) Ban Phai-Borabue: 46.0km (NH209) Khon Kaen-Yang Talat: 65.0km (NH212) Mukdahan-Nikhom Kham Soi: 35.0km (NH401) Don Sak-Sichon: 32.0km (NH403) Nakhon Si Thammarat -NH41 Junction: 32.0km (Total) <u>343.0km</u>	(NH11) Phitsanulok-Uttaradit: 97.7km (NH12) Khon Kaen-Nong Ruea: 47.2km (NH23) Ban Phai-Borabue: 70.0km (NH209) Khon Kaen-Yang Talat: 66.8km (NH212) Mukdahan-Nikhom Kham Soi: 37.8km (NH401) Don Sak-Sichon: 47.6km (NH403) Nakhon Si Thammarat -NH41 Junction : 31.8km (Total) <u>398.9km</u> <u>Additional Outputs</u> (NH11) Wang Thong-Sak Lek: 38.1km (NH12) Phitsanulok bypass: 25.3km (Total) <u>63.4km</u> (Grand total) <u>462.3km</u>
b) Consulting services	Foreign consultants: 41 M/M Local consultants: 112 M/M (Main Scope of Works) <ul style="list-style-type: none"> • Review of detailed designs • Construction supervision • Advisory for environmental monitoring during the construction stage and technology transfer relating to environmental monitoring 	Foreign consultants: 62 M/M Local consultants: 126 M/M (Main Scope of Works) Same as planned
(2) Project period		
<ul style="list-style-type: none"> • Signing of L/A • Detailed design • Selection of consultants • Selection of contractors • Civil works • Consulting services 	September 2000 Jan. 2001-June 2000 (6 months) Sep. 2000-Feb. 2001 (6 months) Sep. 2000-Dec. 2000 (4 months) Mar. 2001-Feb. 2004 (36 months) Mar. 2001-May 2004 (39 months)	September 2000 July 2000-Jan. 2002 (19 months) Sep. 2000-Jan. 2002 (17 months) Oct. 2000-Apr. 2001 (7 months) Jan. 2002-Jan. 2005 (37 months) Jan. 2002-Sep. 2004 (33 months) <i>(Note) project period is deemed to be from the start of detailed design to the end of the consulting services</i>
(3) Project cost		
Foreign currency Local currency Total ODA loan portion Exchange rate	19,050 Million Yen 7,008 Million Yen 26,058 Million Yen 19,544 Million Yen 1 Baht = 2.86 Yen (2000)	17,068 Million Yen 5,684 Million Yen 22,752 Million Yen 17,068 Million Yen 1 Baht = 2.55 Yen (Average between Sep. and Dec. 2000)

Indonesia

Ex-post Evaluation of Japanese ODA Loan Project
“Heavy Loaded Road Improvement Project (2)”

External Evaluator: Nobuyuki Kobayashi
(OPMAC Corporation)
Field Survey: June 2009

1. Outline of the ODA Loan Assistance



Map of the project area



Heavy vehicle running the improved road

1.1 Background

Indonesia has a vast national territory that spreads over 1,800km from north to south and 5,100km from east to west. The country has concentrated on establishing a transportation networks for smooth nationwide freight transport. The road networks, total 400,000km as of 2007, have been developed. Although the road networks across Java and Sumatra reached sufficient level in terms of total length during the latter half of the 1980's, there remained the urgent issue of the establishment of networks to cope with heavy vehicles. The damage of road pavements or bridges has been noticeable, caused by a large increase in the traffic volume along with the progress of motorization and also by an increase in the freight transport with heavy vehicles. In order to deal with the damage of the road assets caused by the increase in heavy vehicles, Bina Marga, the Ministry of Public Works, planned to improve 5,000km of trunk roads (through widening and strengthening, etc.) by 1997. This plan was based on the survey of the traffic distribution and the axle load of the heavy vehicles in 1989. Under this situation, the ODA loan project “Heavy Loaded Road Improvement Project”, which was the first phase, was agreed in 1991, and this project was the second phase. While the first phase aimed at the improvement of 6 trunk roads (683 km) in the southern part of Sumatra (South Sumatra) and Java (Banten, West Java, Central Java, and East Java), the second phase improved 7 trunk roads (231km) in Sumatra (West Sumatra and South Sumatra) and Java

(Banten, West Java, Central Java, D.I.Yogyakarta, and East Java).

1.2 Objective

The objective of this project is to cope with an increase in the traffic of heavy vehicles by upgrading trunk roads as the back bone of the road networks in Java and Sumatra, thereby contributing to the improvement of the efficiency of road traffic.

1.3 Borrower / Executing Agency

Government of Indonesia / Bina Marga, Ministry of Public Works

1.4 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	10,240 million yen / 10,180 million yen
Exchange of Notes / Loan Agreement	December 3, 1996 / December 4, 1996
Terms and Conditions - Interest Rates - Repayment Period - Grace Period - Procurement	2.7% (Consultant Portion 2.3%) 30 years 10 years General Untied
Final Disbursement Date	January 4, 2007
Main Contractors (Over 1 billion yen)	PT. PEMBANGUNAN PERUMAHAN (Indonesia) • PT.AMEN MULIA (Indonesia) (JV), PT. WASKITA KARYA Indonesia), PT. ANGKASAPURI KONSURSINDO (Indonesia), PT. DUTA GRAHA INDAH (Indonesia) • PT.PERWITA KARYA (Indonesia) (JV), PT. SUMBER MITRA JAYA (Indonesia) • PT. YALA PERSADA ANGKASA (Indonesia) (JV), PT.PERWITA KARYA (Indonesia) • SSANGYONG ENGINEERING & CONSTRUCTION CO., LTD. (Korea) (JV)
Main Consultants (Over 100 million yen)	Pacific Consultant International (Japan)
Feasibility Study, etc. (F/S)	JBIC E/S of Heavy Loaded Road Improvement Project

2. Evaluation Results (Rating :B)

2.1 Relevance (Rating: a)

This project has been highly relevant with Indonesia's national policies and development needs at the times of both appraisal and ex-post evaluation; thereby relevance is evaluated to be high.

2.1.1 Consistency with Indonesia's Development Policy

At the time of appraisal, the policy goals of road sector in the Sixth Five Year National Development Plan (1994-1998, REPELITA VI) were to improve the efficiency of road transportation and connection among the regions through the extension of roads, good road conditions, and the improvement of service levels. REPELITA VI prioritized investment in roads and approximately 70% of the development budget for the transport sector was allocated to the road subsector. Furthermore, the reinforcement plan of the trunk road was set as sector plan in 1989. In this plan, in order to deal with an increase of heavy vehicles, the government adopted a policy to upgrade the pavement standard from 8t to 10t axle load across a total section of 9,000km, out of which 5,000km were scheduled to be improved by the end of the fiscal year 1997.

At the time of the ex-post evaluation, as far as the Medium-Term National Development Plan (PRJM 2004–2009) was concerned, the government considered road transportation as one of the most important modes of transportation in Indonesia, and regarded the road transportation as important area of national development. The transport mode played an essential role in passenger and freight traffic. The mid-term strategic plan of Bina Marga (RENSTRA 2005-2009) aims at securing 10t axle load in rehabilitation or maintenance works for national road, taking the smoother traffic of heavy vehicles into consideration. At national policy level, the road sector remains the most important transportation mode. At sector policy level, for the smooth traffic of heavy vehicles, policies continue to aim for the maintenance or upgrade of the axle load of national roads.

This project is consistent with Indonesia's national and sector policy, as the project planned to deal with heavy vehicles by widening or strengthening the trunk road in Java and Sumatra and, thus, to improve the efficiency of freight transportation.

2.1.2 Consistency with Development Needs

In the selection of target sections under this project, criteria such as traffic volume, the ratio of heavy vehicles and road conditions were taken into consideration. The sections were prioritized by the necessity or urgency of the improvement work. It is estimated that the traffic

volumes around the main cities in Java was 10,000 to 20,000 units per day in 1995¹, and this means the road capacity was reaching the limit of the existing infrastructures. For this reason, road improvement for smooth traffic was needed. Considering that the increase in the number of registered vehicles, it can be supposed that motorization has been progressed since the mid-1990's (see Table 1). However, the need of road improvement still remains even today.

Table 1: Number of Registered Vehicles in Indonesia

	Passenger Car	Bus	Truck	Two-wheeler
1993	1,700,454	568,490	1,160,539	7,355,114
2007	8,864,961	2,101,362	4,835,938	41,935,248
Growth Rate	421%	270%	317%	470%

Source: Appraisal documents, Transportation and Communication Statistics 2007

2.2 Efficiency (Rating : c)

The project period was significantly longer than planned, but also the project cost slightly exceeded the plan; therefore efficiency is evaluated to be low.

2.2.1 Outputs

In this project, improvement works (road strengthening, road widening, and the replacement of bridges) were carried out in the target sections in Java and Sumatra. Although the total scope was a total 259.1km, the actual length was 231.1km (89% of that planned) as the scope was changed during project implementation. A significant change was the cancellation of the Kartosuro-Palur section while the Lohbener-Jatibarang section and the Pamanukan-Eretan Kulon section were added (see Table 2). Furthermore, in the Muara Enim-Lahat section, the contract was canceled due to underperformance of the contractor. Retender took place with the section adjusted to Muara Enim-Merapi. ADB financed the improvement work of the Merapi-Lahat section, which was canceled in the project.

Photo 1 Muara Enim – Merapi Section



¹ Based on appraisal documents. The estimate is derived from the Integrated Road Management System in Bina Marga.

Table 2: The Project Target Sections (Planned, Actual)

Planned	Actual
1. Merak – Cilegon (<u>12.1km</u>)	1. Merak-Cilegon (13.99km), Jasa Mrga Access Road (5.12km) <Total : <u>19.11km</u> >
2. Prambanan – Kartosuro (<u>37.7km</u>)	2. Prambanan-Klaten (12.07km),Klaten Bypass (5.36km),Klaten-Kartosuro (21.12km) <Total : <u>38.55km</u> >
3. Kartosuro – Palur (<u>34.6km</u>)	3. Outside the project
4. Yogyakarta – Prambanan (<u>15.3km</u>)	4. Janty Floyover (1.25km), Yogyakarta-Prambanan (12.15km) <Total : <u>13.4km</u> >
5. Nganjuk – Gemekan (<u>61.0km</u>)	5. Nganjuk-Jombang (36.25km), Jombang-Gemekan (18.80km), Jombang-Mojokerto (3.5km) <Total : <u>58.55km</u> >
6. Muara Enim – Lahat (<u>44.6km</u>)	6. Muara Enim-Merapi (<u>15.3km</u>)
7. Lubuk Selasih – Muara Klaban (<u>53.8km</u>)	7. Lubuk Selasih-Solok (23.08km), Solok-Muara Kelaban (26.85km) <Total : <u>49.93km</u> >
	8. Lohbener-Jatibarang (8.86km), Pamanukan-Eretan Kulon (27.36 km) <Total : <u>36.22km</u> >
Total : 259.1km	Total : 231.1km



Figure 1: Map of the Target Sections

2.2.2 Project Period

The project period exceeded the plan substantially. The actual period was 10 years while the planned schedule was 4 years and 4 months (231% of planned). Main reasons behind this delay were that the selection of contractors required a long period. Furthermore, land acquisition was delayed because of a lack of local currency. In this project, land acquisition committees, which were organized by local governments in project areas, had a responsibility for land acquisition. The cost for land acquisition was met from the local governments' budget. Therefore, the executing agency was not concerned with the land acquisition directly and thus could not adequately correspond to the delay of the land acquisition. The final loan disbursement date was extended twice. The second extension was due to a delay of civil work subsequently caused by slow land acquisition in the Pamanukan-Eretan Kulon section.

2.2.3 Project Cost

Although the project cost was estimated at 13,653 million yen (of which the Japanese ODA loan was 10,240 million yen) at the time of planning, the actual cost was 13,024 million yen (of which the Japanese ODA loan was 10,179.76 million yen) (95% of that planned). Considering that the total length of target sections was reduced into 89% of the initial plan, in practical terms, the actual cost exceeded the plan. The main reason for the relatively small reduction in project cost (in consideration of a reduction of the target sections) was an increase in the cost of the civil work.

2.3 Effectiveness (Rating : a)

In the target sections, an increase in the traffic volume continues. The timeliness of road transport arguably has improved. Because of an increase in the traffic demand and the improvement of service quality, this project has largely achieved the targeted effects; therefore its effectiveness is evaluated to be high.

2.3.1 Change of the Annual Average Daily Traffic

Annual Average Daily Traffic (AADT) has been continuously monitored in 11 sections out of the improved sections. AADT had increased between 1996 (before the project implementation) and 2007 (after the project completion) in all those sections. The total traffic volume of the 11 sections is growing at 5% per annum (see Table 3).

Table 3: AADT of the Improved Sections

Province	Section	1996	2005	2006	2007	Rate of Increase/year
Banten	Merak - Cilegon	5,859	9,969	10,890	11,435	6.27%
West Java	Lohbener - Jatibarang	14,665	17,132	17,743	18,355	2.06%
Central Java	Prambanan - Klaten	15,461	19,556	24,050	25,012	4.47%
Central Java	Klaten - Kartosuro	15,925	26,133	27,066	28,000	5.26%
D.I. Yogyakarta	Yogyakarta - Prambanan	10,804	25,061	32,811	28,508	9.22%
East Java	Kertosono - Nganjuk	9,209	11,188	11,606	12,024	2.45%
East Java	Jombang - Kertosono	11,912	19,609	20,342	21,075	5.32%
East Java	Jombang - Mojokerto	11,503	18,935	19,643	20,350	5.32%
South Sumatra	Muara Enim - Lahat	3,246	6,891	7,201	7,450	7.85%
West Sumatra	Lubuk Selasih - Solok	4,576	6,291	6,530	6,720	3.56%
West Sumatra	Solok - Muara Klaban	3,671	7,337	7,668	7,932	7.26%
Total		106,831	168,102	185,550	186,861	5.21%

2.3.2 Traffic Volume Survey

In the ex-post evaluation, traffic surveys were conducted on two project sites, the Gemekan-Nganjuk section in East Java and the Muara Enim-Merapi section in South Sumatra². The survey results show that the percentage of trucks and buses, both of which are expected to grow after project implementation, accounts for roughly 20 to 30% of the total traffic (see Table 4). Half of the traffic was two-wheelers (motorcycles, bicycles and etc.), and the traffic volume of two-wheelers showed a significant increase (40.9% in 2004 to 53.1% in 2009). Heavy vehicles (trucks and buses) made up 50% of the traffic excluding two-wheelers. Compared to data taken before the project completion³, heavy vehicles (trucks and buses) had increased slightly (20.6% in 2004 to 21.8% in 2009) (see Figure 2). The ratio of heavy vehicles over total traffic is relatively high and, thus, it is thought that the project has contributed to smoother traffic for heavy vehicles.

² The traffic survey between Gemekan-Nganjuk section was conducted in April 2009 and the survey between Muara Enim-Merapi section was conducted in May 2009.

³ Bina Marga conducted the traffic volume survey between Kertosono-Nganjuk in 2004. At the time of the ex-post evaluation, traffic volume survey between Gemekan-Nganjuk was conducted in 2009.

Table 4: Traffic Volume on the Roads Improved by the Project (24hours, both lanes)

	Two-Wheeler	Passenger Car, Small Truck	Bus	Truck	Total
Gemekan - Nganjuk	28,493	13,073	1,460	10,120	53,146
	53.6%	24.6%	2.7%	19.0%	100.0%
Muara Enim - Merapi	4,958	1,985	145	2,465	9,553
	51.9%	20.8%	1.5%	25.8%	100.0%

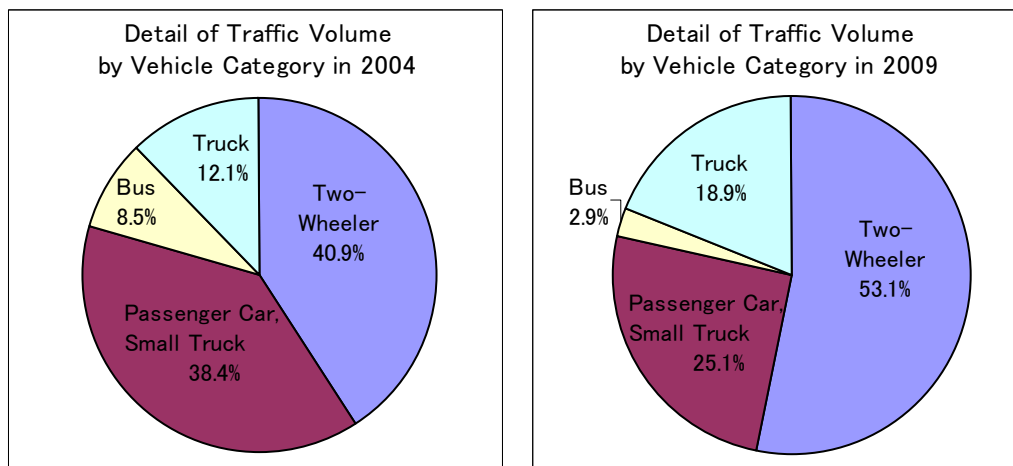


Figure 2: Change of the Vehicle Category Before/After the Project

2.3.3 Results of the Questionnaire Survey for Bus and Truck Drivers

Results of the questionnaire survey for bus and truck drivers at the time of the ex-post evaluation are shown below. According to answers to the question on the traffic volume, the respondents who chose “increased” or “increased slightly” totaled 86.7%. This result matches the increase in the traffic volume, mentioned above, after the project completion (see Table 5). The total of answers of “increased” and “increased

Photo 2 Questionnaire Survey for Drivers



slightly” for the question on the bus and truck volume totaled about 70% to 80%. This illustrates an increase in heavy vehicles (see Table 6 and 7). Furthermore, the number of respondents who answered “improved” or “improved a little” for the question on the timeliness of freight and passenger services came to 55%. This implies that the traffic jams which obstruct freight and passenger services have not yet occurred (see Table 8).

Beneficiary Survey Conducted in this Ex-Post Evaluation

In the ex-post evaluation of “ Heavy Loaded Road Improvement Project (2) ”, the questionnaire survey and the group interviews with beneficiaries were carried out. The purpose of the beneficiary survey is to complement the traffic and economic statistics and to analyze the project effect from the users’ viewpoint. The beneficiary survey in this ex-post evaluation is as follows.

<Questionnaire survey for business offices located along the target section>

Location : Gemekan-Nganjuk section (East Java) and Muara Enim-Merapi section (South Sumatra)

Date : March and April, 2009

Target : Business owners and employees from offices located along the project sites

No. of Samples : 60 persons (30 persons in East Java and 30 persons in South Sumatra)

<Questionnaire survey for bus and truck drivers>

Location : Gemekan – Nganjuk section (East Java) and Muara Enim – Merapi section (South Sumatra)

Date : March and April, 2009

Target : Bus and truck drivers using the project target section

No. of Samples : 60 persons (30 persons in East Java and 30 persons in South Sumatra)

<Focus group discussion for residents living along the target section>

Place : Jombang (East Java) and Muara Enim (South Sumatra)

Time : March and April, 2009

Target : Residents living along the project target section

No. of Samples : 26 persons (12 persons for Jombang and 14 persons for Muara Enim)

Table 5: Increase in Traffic Volume after Project Completion (Questionnaire for drivers)

	Increased	Increased Slightly	Decreased Slightly	Decreased	Invalid	Total
Number of Respondents (persons)	30	22	1	1	6	60
Ratio	50.0%	36.7%	1.7%	1.7%	10.0%	100.0%

Table 6: Increase in Trucks after Project Completion (Questionnaire for drivers)

	Increased	Increased Slightly	Decreased Slightly	Decreased	Invalid	Total
Number of Respondents (persons)	31	17	2	1	9	60
Ratio	51.7%	28.3%	3.3%	1.7%	15.0%	100.0%

Table7: Increase in Buses after Project Completion (Questionnaire for drivers)

	Increased	Increased Slightly	Decreased Slightly	Decreased	Invalid	Total
Number of Respondents (persons)	18	24	5	1	12	60
Ratio	30.0%	40.0%	8.3%	1.7%	20.0%	100.0%

Table 8: Improvement in Timeliness of Freight and Travel Services after the Project Completion (Questionnaire for drivers)

	Improved	Improved Slightly	Deteriorated Slightly	Deteriorated	Invalid	Total
Number of Respondents (persons)	16	17	12	8	7	60
Ratio	26.7%	28.3%	20.0%	13.3%	11.7%	100.0%

2.4 Impact

2.4.1 Impact on Regional Economy

(1) Increase in GRDP

A comparison of the Gross Regional Domestic Products (GRDP, nominal) of 1998 and 2007⁴ shows that the total GRDP of the provinces which includes the project target sections grew slightly more than that of the country as a whole (see Table 9). As this project aims to improve the trunk roads in the main cities of Java and Sumatra, the project can be presumed to have supported economic growth in the project areas through the improvement of the transport.

⁴ Because the year 1998 is the year before the civil works started and the year 2007 is the year for which the most recent data for the ex-post evaluation exists, these years are selected as the targets for comparison. As Banten was separated from West Java, also Bangka Belitung was separated from South Sumatra in 2000, the 2007 data of West Java included the data of Banten and South Sumatra included the data of Bangka Belitung.

Table 9: GRDP by Province (nominal GDP)

(unit: million Rupiah)

Province	1998	2007	Growth Rate
West Java	142,763,786.00	633,652,183.04	343.8%
Central Java	84,610,223.00	312,428,807.09	269.3%
D.I. Yogyakarta	9,863,894.00	32,916,736.41	233.7%
East Java	135,753,197.00	534,919,332.96	294.0%
South Sumatra	33,071,513.00	127,790,723.52	286.4%
West Sumatra	17,642,740.00	59,799,045.30	238.9%
Total of the Project Target Provinces	423,705,353.00	1,701,506,828.32	301.6%
Whole Indonesia	889,344,528.00	3,526,336,644.46	296.5%

(2) Contribution to Employment

An increase in employment has been seen in the project target sections. To sum up the employment figure in the project target sections, it accounts for about 60% of the whole of Indonesia with a growth rate that rather exceeds the national rate (see Table 10). The result of the questionnaire (for 60 persons) for the business offices along the target sections is evidence of the improvement at micro level. A majority of respondents answered that the start-up of new businesses had been activated after project completion. Approximately 50% of the respondents were of the opinion that employment opportunities were improving (see Table 11 and 12). It seems that the employment environment improved due to the revitalization of the regional economy advancing with the background of improvements in the transport and an increase in traffic volume. However, it is difficult to analyze this thoroughly as changes in the employment environment also reflected factors other than the road improvement.

Table 10: Number of Employees by Province⁵

Province	August, 1998	August, 2007	Growth Rate
West Java	15,307,495	20,149,290	31.6%
Central Java	14,128,038	15,463,658	9.5%
D.I. Yogyakarta	1,493,940	1,892,205	26.7%
East Java	16,588,550	18,882,277	13.8%
South Sumatra	3,113,701	3,684,304	18.3%
West Sumatra	1,856,880	1,956,378	5.4%
Total of the Project Target Provinces	52,488,604	62,028,112	18.2%
Whole Indonesia	87,049,756	102,552,750	17.8%

Source: Labor Force Situation in Indonesia 1997 and 2008

⁵To compare the data strictly, West Java included Banten, and also South Sumatra included Bangka Belitung in 2008.

Table 11: New Businesses Launched after Project Completion
(Questionnaire survey for business offices located along the target section)

	Increased	Not Changed	Decreased	Total
Number of Respondents	47	13	0	60
Ratio	78.3%	21.7%	0.0%	100.0%

Table 12: Employment Opportunities after Project Completion
(Questionnaire survey for business offices located along the target section)

	Increased	Not Changed	Decreased	Total
Number of Respondents	27	29	4	60
Ratio	45.0%	48.3%	6.7%	100.0%

2.4.2 Impact on Natural Environment

An Environmental Impact Assessment was not conducted, though a brief survey had already been conducted at the time of appraisal.⁶ However, during project implementation, a consultant for project monitoring and supervision visited the project sites regularly. The consultant assessed negative impacts such as noise and dust by hearing with the use of a check list and reported routinely. In order to solve the problems revealed by monitoring, remedial actions, such as changes of construction methods, were taken. As a result of the field survey, no severe negative effects on the environment were observed in the project areas.

From the results of the questionnaire survey for business offices located along the target areas conducted at the ex-post evaluation, it can be seen that a majority of the respondents (about 73%) answered that there were environmental impacts. As environmental data were not collected in the project areas, the analysis whether or not actual data surpasses environmental standards is not available. Due to the lack of objective data, residents' opinion cannot be evidenced.

2.4.3 Impact on Local Residents

(1) Land Acquisition

As mentioned at "2.2.2 Project Period", the lack of local governments' budget resulted in the slow progress of land acquisition. In this project, the executing agency, Bina Marga, was not concerned with the land acquisition directly as land acquisition was implemented with local government budget. For this reason, Bina Marga has not collected sufficient information including that on any negative effects on displaced residents. This reveals a weakness in

⁶ Negative impact on natural environment was not predicted at the time of appraisal since the project improved existing roads.

project monitoring during the implementation phase.

(2) Increase in Traffic Accidents

Local residents express the opinion that the traffic accidents have increased. Nevertheless, it is not possible to directly correlate the road improvement with the traffic accidents due to the lack of objective data. There are no statistics for traffic accidents by sections because data is collected region by region (prefecture). Focus group discussions, in which 26 residents living along the target areas (12 persons for Jombang, 14 persons for Muara Enim) participated, were conducted in two locations (Jombang in East Java and Muara Enim in South Sumatra) along the improved sections. In these sessions, 13 persons pointed out an increase in traffic accidents while 18 persons mentioned smoother transportation (time saving etc.) as a change after project completion. This opinion was verified in the questionnaire survey for bus and truck drivers. Among the drivers, approximately 80% of respondents shared the opinion that traffic accidents increased after project completion (see Table 13).

Table 13: Increase and Decrease in Traffic Accidents (Questionnaire for drivers)

	Increased	Not Changed	Decreased	Total
Number of Respondents	46	6	8	60
Ratio	76.7%	10.0%	13.3%	100.0%

2.5 Sustainability (Rating: a)

No major problem has been observed in the capacity of the executing agency or in its operation and maintenance (O&M) system; therefore, the sustainability is evaluated to be high. As the budget for O&M is increasing and the national roads are kept in better conditions, it can be judged that the improved sections are maintained appropriately.

2.5.1 Executing Agency

2.5.1.1 Structural Aspects of Operation and Maintenance

The O&M system of this project has changed considerably before and after project implementation. At the time of appraisal, it was expected that provincial departments of public works would maintain the roads while the regional offices of the Ministry of Public Works conducted O&M planning or gave technical guidance to the provinces. After the resignation of President Soeharto in 1998, as a result of the review of the administrative organization, regional offices (Balai) which are in charge of more than one province under Bina Marga took charge of routine maintenance (inspection, cleaning up and minor civil works, etc.), periodic maintenance and emergency maintenance of roads. Ten Balai are situated across Indonesia. Four Balai handle O&M of the sections improved by the project

(see Figure 3 and Table 14). Although Balai delegate routine maintenance of some sections to provincial governments, they remain responsible for the supervision of roads including these sections. Each Balai decides on the O&M work plan while the Bina Marga head office decides which section requires maintenance by using the road management system. Each Balai collects and reports the data for the road management system while the Bina Marga head office administers the database. It can be concluded that there is no problem in the O&M system as managerial responsibilities for O&M are clear.

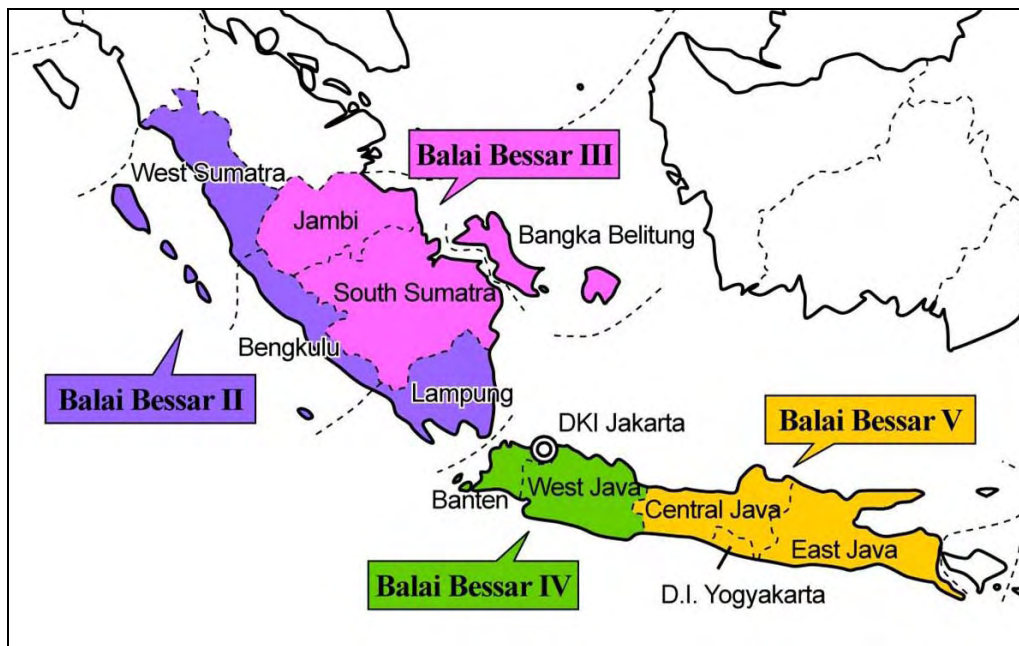


Figure 3: Administration Area of Each Balai

Table 14: Administration Section of Each Balai

Offices	The Project Target Sections
Balai Besar II	<ul style="list-style-type: none"> • Lubuk Selasih – Solok • Solok – Muara Kelaban
Balai Besar III	<ul style="list-style-type: none"> • Muara Enim – Merapi
Balai Besar IV	<ul style="list-style-type: none"> • Merak – Cilegon • Jasa Mrga Access Road • Lohbener – Jatibarang • Pamanukan- Eretan Kulon
Balai Besar V	<ul style="list-style-type: none"> • Janty Floyover • Yogyakarta – Prambanan • Prambanan – Klaten • Klaten Bypass • Klaten-Kartosuro • Nganjuk – Jombang • Jombang – Gemekan • Jombang - Mojokerto

2.5.1.2 Technical Aspects of Operation and Maintenance

Each Balai has approximately 15 engineers. As these engineers belong to each Balai directly, they can visit sites frequently. The engineers gain local information such as on landform and soil condition. Meanwhile, this system allows Balai to use the technical knowledge of the engineers at a regional level. Engineers directly under Balai are given the training for the assessment of road conditions, survey methods of traffic volume, electronic procurement, and so on.

2.5.1.3 Financial Aspects of Operation and Maintenance

O&M costs for the sections improved by the project are allocated from the central government general budget. Balai delegate routine maintenance of some sections to the provincial governments but retain supervisory responsibilities. Balai

Table 15: Operation and Maintenance Budget

(unit: 1 billion rupiah)

	2006	2007	2008
RENSTRA (planned)	6,035	5,850	5,186
Budget allocation	1,482	2,495	2,872
% of sufficiency	24.6%	42.6%	55.4%

Source: Bina Marga

outsources routine maintenance to the provincial governments by using the budget allocated by the central government.

Of the O&M budget in FY2008, the budget allocation is about 60% of that planned by RENSTRA of the Ministry of Public Works (see Table 15). Budget allocation increased in the last three years and it became more focused on the road maintenance.

2.5.2 Current Status of Operation and Maintenance

Bina Marga classifies road conditions by IRI⁷ as follows.

- IRI 0-4 m/km : Good – appropriate for daily maintenance
- IRI 4-8 m/km : Fair – appropriate for regular maintenance
- IRI 8-12 m/km: Poor – appropriate for rehabilitation
- IRI >12 m/km : Bad – Appropriate for reconstruction including the sub-base

IRI for the project target sections are as Table 16. In all improved sections, the road conditions are “Good” and “Fair”; most of the sections are classified as “Good”.

⁷ International Roughness Index. IRI is an index expressing the unevenness of roads where 4-5m/km is the comfortable value for driving in generally.

Table 16: IRI of the Improved Sections by the Project

Province	Sections	2005	2006	2007
Banten	Merak - Cilegon	3.94	3.93	3.92
West Java	Lohbener - Jatibarang	5.90	5.00	4.10
Central Java	Prambanan - Klaten	3.60	3.56	3.56
Central Java	Klaten - Kartosuro	2.56	2.30	2.70
D.I. Yogyakarta	Yogyakarta - Prambanan	2.97	3.20	2.40
East Java	Kertosono - Nganjuk	3.34	4.72	5.38
East Java	Jombang - Kertosono	3.20	2.70	2.30
East Java	Jombang - Mojokerto	3.89	3.38	3.00
South Sumatra	Muara Enim - Lahat	6.43	6.17	5.81
West Sumatra	Lubuk Selasih - Solok	3.84	3.66	3.48
West Sumatra	Solok - Muara Klaban	3.30	3.09	3.04

Source: Bina Marga

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

As project completion was delayed due to reasons such as the prolonged time of land acquisition, the efficiency of this project is considered low. On the other hand, considering policy and development needs, the relevance is high. Effectiveness can be evaluated as high because traffic demand for the completed roads grows. This project supported regional economic growth in terms of freight transportation. There was a positive impact on the generation of employment opportunities. The sustainability of this project is high in terms of the O&M system, technology, and finance in the executing agency as the roads improved by the project remain in good conditions. In light of the above, this project is evaluated to be satisfactory.

3.2 Lessons Learned

(1) Reinforcement of the Monitoring System on Land Acquisition

Local governments were in charge of land acquisition in this project and the executing agency started the civil work after land acquisition was completed. However, the delay in the land acquisition became an issue. Insufficient information sharing between the executing agency and local governments regarding the land acquisition process revealed the problem of project monitoring. Bina Marga was informed very little about the negative impact on

residents affected by land acquisition. It is preferable to establish a system to carry out land acquisition smoothly by assigning staff to land acquisition monitoring in the executing agency and by improving their capability to monitor land acquisition through training, dispatches of experts, and consulting services of the ODA loan projects.

(2) Enhancement of Feed Back Function for Environment Issues and Traffic Safety

The lack of data on traffic safety and the environment to allow “Before and After” analysis made comparison of negative impacts difficult and also weakened the feed back function through PDCA cycle⁸. It is preferable to set the indicators at the time of appraisal and collect data before and after project completion.

3.3 Recommendations

None

⁸ Initials of four steps of the project; Plan – Do – Check – Act. The project is improved continuously by management of PDCA cycle.

Comparison of Original and Actual Scope

Item	Original	Actual
1. Output		
a) Civil works	<p>Improvement construction as follows (widening, upgrading of the axle load, replacement of bridges and etc.)</p> <ol style="list-style-type: none"> 1) Merak – Cilegon 2) Prambanan – Kartosuro 3) Kartosuro – Palur 4) Yogyakarta – Prambanan 5) Nganjuk – Gemekan 6) Muara Enim – Lahat 7) Lubuk Selasih – Muara Klaban <p>Total : 259.1km</p>	<p>Improvement construction as follows (widening, upgrading of the axle load, replacement of bridges and etc.)</p> <ol style="list-style-type: none"> 1) Merak – Cilegon, Jasa Mrga Access Road 2) Prambanan – Klaten, Klaten Bypass, Klaten – Kartosuro 3) Outside of the project 4) Janty Floyover, Yogyakarta – Prambanan 5) Nganjuk – Jombang, Jombang – Gemekan, Jombang – Mojokerto 6) Muara Enim – Merapi 7) Lubuk Selasih – Solok, Solok – Muara Kelaban 8) Lohbener – Jatibarang , Pamanukan- Eretan Kulon <p>Total : 231.1km</p>
b) Consulting service	<p>Content of consulting service as follows.</p> <ol style="list-style-type: none"> 1) Review of detail design 2) Procurement assistance 3) Execution management 	<p>Content of consulting service as follows.</p> <ol style="list-style-type: none"> 1) Review of detail design 2) Procurement assistance 3) Execution management 4) Survey of landform and geology
2) Project period		
Consultant selection	December 1996-June 1997	December 1996-June 1998
Consulting service	July 1997-March 2000	July 1998-November 2006
Bid	January 1997-March 1998	October 1998-March 2005
Land acquisition	April 1997-March 1998	October 1997-March 2005
Civil works	April 1999-March 2000	December 1999-November 2006
3) Project cost		
Total	13,653 million yen	13,024 million yen
ODA loan portion	10,024 million yen	10,180 million yen
Exchange rate	1 Rp= 0.046 yen (as of 1996)	1 Rp= 0.014 yen (1997-2006 average)

Indonesia

Ex-post Evaluation of Japanese ODA Loan Project
“Sumatra East Coast Highways”

External Evaluator: Keishi Miyazaki
(OPMAC Corporation)
Field Survey: June 2009

1. Outline of the ODA Loan Assistance



Map of the project site



Project target road
(Seputih Banyak – Manggala Section)

1.1 Background

Sumatra Island has an area of 482,000 km², stretching 1,700km from north to south and 300km from east to west, which is about 1.25 times larger than the land area of Japan. In 1995, the total population of Sumatra Island was about 40 million; about 20 percent of the total population of Indonesia. The trunk roads in Sumatra Island have been well developed with the Java Island and Trans Sumatra Highway already serving the people of Sumatra, which has a total length of 2,500km starting from Bakauheni port, located at the south end of Sumatra, and ending in Banda Aceh, located at the north end. The road passes through the central mountain ranges and through major cities like Padang in the center and Medan in the north. However, this Trans Sumatra Highway does not directly connect with other major cities in the east side of Sumatra such as Dumai, Jambi, and Palembang. Therefore, the preparation of a master plan for a new trunk road development to directly link other major cities in the east side of Sumatra was supported by JICA, and “Development Study of Coastal Roads on the East Coast of Sumatra”¹ was prepared in 1992.

¹ Development Study of Coastal Roads on the East Coast of Sumatra proposed the widening and improvement of the existing national highways and provincial roads for the existing 1,900km from Medan in the north to Bakauheni in the south. For some sections new road construction such as for bypass roads was proposed.

Whilst the east coast area of Sumatra has a favorable climate condition and is rich in natural resources, the area also has great potential for plantation agricultural development, paddy cultivation and energy resource development. Lampung Province, the southern part of Sumatra, where the project target road is located includes Bakauheni port operating ferry transport between Sumatra Island and Java Island. Lampung Province is, therefore, a strategic point for the land transport and distribution of goods in Sumatra.

1.2 Project Objective

The objective of this project was to upgrade and improve a part of the Sumatra East Coast Highway in order to cope with the increasing traffic volume, thereby contributing to the development of the Island of Sumatra.

1.3 Borrower / Executing Agency

Government of Indonesia / Directorate General of Highways (Bina Marga), Ministry of Public Works

1.4 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	6,652 Million Yen / 4,763 Million Yen
Exchange of Notes / Loan Agreement	January 27, 1998 / January 28, 1998
Terms and Conditions - Interest Rates - Repayment Period - Grace Period - Conditions of Procurement	2.7% p.a. (Consultant portion: 2.3% p.a.) 30 years 10 years General Untied
Final Disbursement Date	February 2007
Main Contractor (Over 1 billion yen)	PT ADHI KARYA (Indonesia), SSANGYONG (South Korea), PT. HUTAMA KARYA (Indonesia)-PT. WIJIYA KARYA (Indonesia) (JV)
Main Consultant (Over 100 million yen)	Pacific Consultants International (Japan)
Feasibility Study, etc. (F/S)	Development Study of Coastal Roads on the East Coast of Sumatra, JICA, (1992)

2. Evaluation Results (Rating: B)

2.1 Relevance (Rating: a)

This project has been highly relevant with the Indonesia's national policies and development needs at the times of both appraisal and ex-post evaluation; therefore its relevance is high.

2.1.1 Consistency with Indonesia's Development Policy

At the time of appraisal, the policy goals for the road sector in the Sixth Five-Year National Development Plan (1994-1998, REPELITA VI) were more efficient road transportation and smoother traffic between regions by the extension of road networks, better road conditions, and the improvement of service levels. Also, a reinforcement plan for trunk roads (1989)² included improvement of the road surface and road widening for the trunk road networks in Sumatra and Java regions as one of its main priority projects. This project was planned based upon the Development Study of Coastal Roads on the East Coast of Sumatra (total length of the target road: 1,900km) in 1992.

At the time of the ex-post evaluation, in the Medium-Term National Development Plan (RPJM 2004-2009), the government considered road transportation as one of the most important means of transport in Indonesia, and regarded road transportation as an important area for passenger and commodity transport in national development. This transport mode played an essential role in passenger and freight traffic. Also, one of the targets of the Road and Bridge Improvement Program under RPJM is the development of primary arterial roads in national economic centers, including Sumatra Island. The



Figure 1: Sumatra East Coast Highway and Trans Sumatra Highway

² This plan was prepared based upon the study conducted by Bina Marga in 1989. In this plan, in order to deal with an increase of heavy vehicles, the government proclaimed the policy to upgrade the pavement standard from 8t to 10t axle load across total 9,000km sections, out of which 5,000km were scheduled to be improved by the end of fiscal year 1997.

Development Study of Coastal Roads on the East Coast of Sumatra, including the target sections of the project, has been promoted by the Indonesian government and the priority of the project is still high.

2.1.2 Consistency with Development Needs

At the time of appraisal, the Trans Sumatra Highway (total length 2,500km) was already in existence running through the north and south of Sumatra Island, but it did not directly link major cities in the east coastal area such as Dumai, Jambi, and Palembang. This was a problem for inter-city networks. Also, there had been less development of road infrastructure in the east coastal area in Sumatra leaving problems such as missing links and unpaved road surfaces in many sections which in turn produced a disincentive for the development of land and natural resources. Furthermore, since there was a ferry port in the Ketapang area in Lampung Province – the gateway between Sumatra and Java – frequent traffic congestion occurred in Lampung Province and the neighboring areas due to the large traffic volume of trucks and large vehicles travelling between Sumatra and Java. It was estimated that traffic volume would increase with the development of the area in the future.

At the time of ex-post evaluation, one of the objectives of the Strategic Plan of Lampung Province (2004-2009) was to increase the quality and quantity of infrastructure services such as roads, irrigation, energy, and telecommunications. The plan sets a target to increase good road conditions to 80% of the 2,400km of provincial roads and to support the acceleration of good national road conditions to 90% of the 851km of national roads. The main industries in Lampung Province, which is a project target area, are plantation agriculture such as rubber and sugarcane production and aqua culture. The project target road plays an important role as a transportation route for these primary commodities. In addition, the transport volume by ferry between Bakauheni port in Sumatra and Merak in Java has increased year by year, and the traffic volume in Lampung Province is expected to grow in the future. Therefore, the development needs of the project are still high.

2.2 Efficiency (Rating: c)

Both project period and cost extended the planned value respectively, therefore efficiency of the project is low.

2.2.1 Outputs

The outputs of the project were the improvement of roads and the construction and

replacement of bridges in the Ketapang – Manggala section, which was a part of the target section of JICA’s Development Study of Coastal Roads on the East Coast of Sumatra. The project outputs actually realized were almost the same as those planned except for an extension of 18km road length. This extension was caused by: (i) design change of a part of the Jepara – Seputih Banyak section (CA-2) passing through the town center of Sukadana to a bypass road detouring the town center due to the difficult land acquisition negotiation with the residents in Sukadana, and (ii) design change of a part of the Seputih Banyak – Manggala section (CA-2) due to the geographical condition. However, 24km of the road, which consists of 22.7km in the Ketapang – Jepara section and 1.3km at the Jepara - Seputih Banyak section, out of a total 186.1km in the Ketapang – Manggala section was not yet completed as of May 2009. A percentage of completion was therefore 87% (see Table 1).

Table 1: Comparison of Planned and Actual Outputs

Planned Outputs (at Appraisal)	Actual Outputs (at Ex-Post Evaluation)
(1) Road improvement (CA-1) Ketapang – Jepara: 68km (CA-2) Jepara – Seputih Banyak: 50km (CA-3) Seputih Banyak – Manggala: 50km Total: 168km	(1) Road improvement (CA-1) Ketapang – Jepara: 69.5km (CA-2) Jepara – Seputih Banyak: 60.1km (CA-3) Seputih Banyak – Manggala: 56.5km Total: 186.1km (note) Total 24km of the road, consisting of 22.7km in the Ketapang – Jepara section and 1.3km in the Jepara - Seputih Banyak section was incomplete as of May 2009. The entire section is scheduled to be completed in December 2009.
(2) Consulting services - Foreign consultants: 75 M/M - Indonesian consultants: 314 M/M	(2) Consulting services - Foreign consultants: 104 M/M - Indonesian consultants: 528 M/M

The major reason for the incomplete project outputs was the delay in the land acquisition process. Construction works for the incomplete section were ongoing at the time of the ex-post evaluation, and the executing agency expects to finalize the pending land acquisition processes by August 2009 and to complete the construction of the unfinished section by December 2009, resulting in the full operation of the entire section. Since the expiry date of the Japanese ODA loan agreement for this project had already passed in February 2007, the project cost for the incomplete section has been financed by the Indonesian government. Details regarding the delay in the land acquisition process are explained in “2.2.2 Project period” and “2.4.6 Social impact relating to the resettlement of people and land acquisition”.

Regarding the consulting services, the actual work volume was 632 M/M (104 M/M

for foreign consultants and 528 M/M for Indonesian consultants) against the planned 389 M/M (75 M/M for foreign consultants and 314 M/M for Indonesian consultants). This was equal to 1.6 times of the planned work volume. The main reason for this increase was the extra work volume caused by the detailed design for an additional 94.9km road connecting with the project target section and including the following three sections: (i) the Ketapang – Bakauheni section (17.3km), (ii) the Manggala – Pasir section (39.9km), and (iii) the Pasir - Pematang Panggang section (37.7km)³. This additional consulting service was included in the project scope by the request of the executing agency.

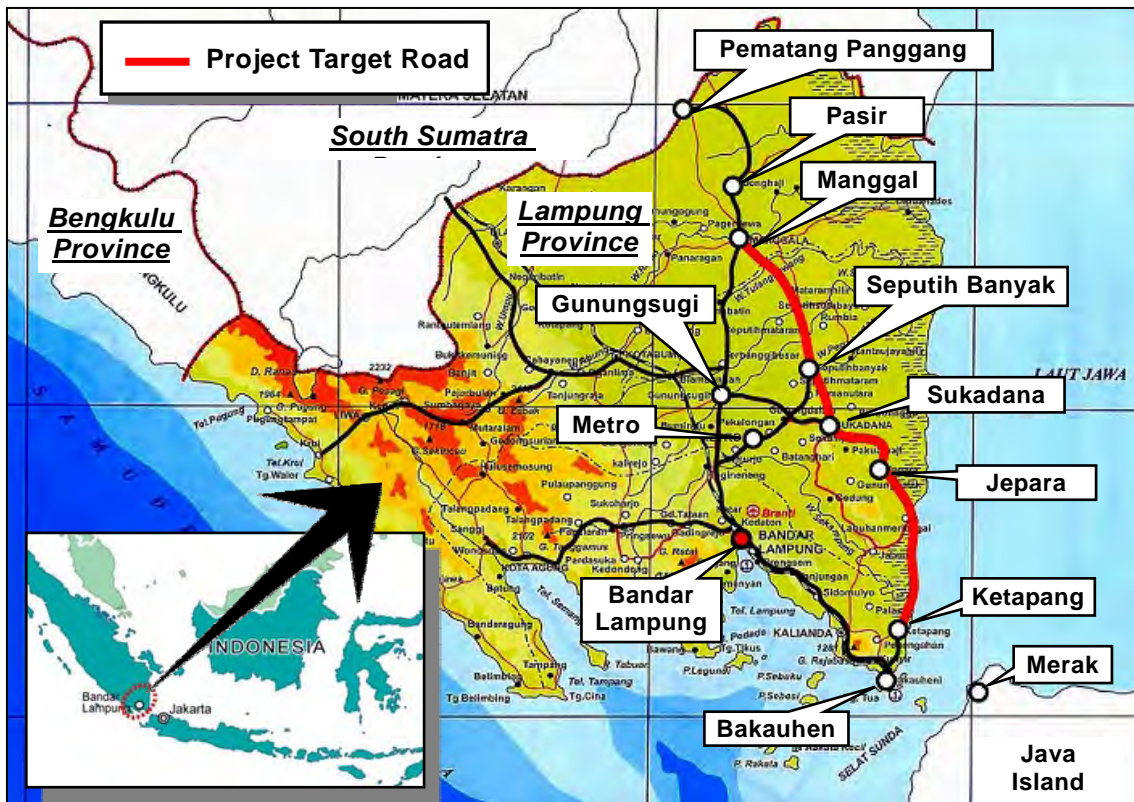


Figure 2: Map of Project Target Section

2.2.2 Project period

The actual project period was 12 years from January 1998 to December 2009 against a planned period of 5 years and 5 months from November 1997 to March 2003, which was equal to 222% of the planned period. In December 2004, the expiry date of the loan agreement for the project was extended another two years to February 2007 as project completion by February 2005, the original expiry date of the loan agreement, was

³ These three additional sections were a part of the target section of the Development Study of Coastal Roads on the East Coast of Sumatra, but they are not part of the target section of the project. Whilst the improvement work of (i) the Ketapang – Bakauheni section had already been completed with Indonesian government funds, neither land acquisition nor the improvement work of (ii) the Manggala – Pasir section and (iii) the Pasir – Pematang Panggang section had been implemented as of May 2009.

unlikely at that time. Despite this, the entire section of the project had still not been completed by February 2007 due to the delay in land acquisition. In this ex-post evaluation, the effectiveness and impact of the entire target section of the project are principally examined but not of the individual completed sections. Therefore, the actual project period is deemed to last from the signing of the loan agreement to the completion of the entire target section of the project which is scheduled to be completed in December 2009.

The major reasons for the delay were: (i) a prolonged procurement process caused by higher tender prices against the estimated project cost⁴, (ii) additional time spent on detailed design for the additional sections⁵, and (iii) delay in construction works caused by low performance of the contractor in charge of the Jepara - Seputih Banyak section⁶. The most important reasons, however, were (iv) the delay in the preparation of budget for the land acquisition by the local governments and the prolonged land acquisition process due to difficult negotiations with land owners.

The Seputih Banyak – Manggala section (CA-3) (56.5km) was completed in January 2005. Regarding the Ketapang – Jepara section (CA-1) (69.5km), the contract period of the Indonesian contractor for CA-1 expired in July 2006 and the civil works for the incomplete section of 22.7km were implemented under a new contract with another Indonesian contractor (new contract period: March 2008 – December 2009). Regarding the Jepara – Seputih Banyak section (CA-2) (60.1km), the contract period of the Korean contractor also expired in March 2006 and the civil works for the incomplete section of 1.3km were implemented under a new contract with another Indonesian contractor (new contract period: March 2009 – September 2009).

⁴ During the tender process for the contractors, the following problems arose such as: (i) the lowest bid prices exceeded the estimated budget sum and (ii) there was deficit in the document submitted by one of the lowest bidders. As a result, 10 month delayed.

⁵ In addition to the change of detailed design for a part of the project target road, the detailed design for the following three additional sections linked to the project road such as: (i) the Ketapang – Bakauheni section (17.3km), (ii) the Manggala – Pasir section (39.9km), and (iii) the Pasir - Pematang Panggang section (37.7km) was included to the project scope, which required an additional period.

⁶ Although the construction work at Sukadana Bypass was available since the commencement of the contract date, the implementation of its construction work was delayed since the contractor of CA-2 gave the first priority on the cost, thus mobilization of engineers and workforces, procurement of construction equipments and materials, and financial arrangement were delayed.



Ketapang – Jeparu Section
(at Pasir Sakti)



Ongoing road improvement work
(at the 2-3 km south from Jeparu)



Ongoing road widening work
(at the 2-3 km south from Jeparu)

2.2.3 Project cost

The actual project cost was 11,627 million yen (of which the Japanese ODA loan was 4,763 million yen) against the planned cost of 8,869 million yen (of which the Japanese ODA loan was 6,652 million yen), equal to 131% of the planned cost and 72% of planned loan amount (see Table 2). The first reason for the cost-overrun was the increase in construction costs caused by the prolonged project implementation period. The second reason was the increase in land acquisition costs. The project cost disbursed by February 2007 was financed by the Japanese ODA loan, but the remaining project cost for the 24km incomplete section was financed by the Indonesian government.

Table 2: Comparison of Planned and Actual Project Cost

(Unit: million Yen)

	Plan	Actual		
		Before project implementation period (until Feb. 2007)	After project implementation period* (Feb. 2007 – Dec. 2009)	Total
1. Civil work				
Package CA-1	n.a.	1,899	1,289	3,188
Package CA-2	n.a.	1,656	1,150	2,806
Package CA-3	n.a.	1,898	755	2,653
Sub-total	6,377	5,453	3,194	8,647
2. Contingency	447	-	-	-
3. Consulting services	759	710	0	710
4. Land acquisition	738	499	907	1,406
5. Tax and duties	548	545	319	864
Total	8,869	7,207	4,420	11,627
(of which Japanese ODA loan)	(6,652)	(4,763)		(4,763)

Source: Bina Marga, Ministry of Public Works

Note 1): *The actual project cost under the finance of the Indonesian government includes the estimated project cost to December 2009.

Note 2): Since there was a time lag between the progress of the construction work for each target section and payment to the contractor, even after the construction work was completed for some sections before February 2007, the final payment disbursed late after February 2007.

2.3 Effectiveness (Rating: a)

In the target section, a significant increase in traffic volume as well as a saving in travelling time and an improvement in average speed (velocity) were realized. Also,

positive impacts such as the promotion of commodity distribution and the movement of people and regional development were observed. Therefore, in general, this project has largely produced the planned effects, and its effectiveness is high.

2.3.1 Increase in Traffic Volume

Although traffic volume data for the project target section of pre-project implementation could not be collected, the Annual Average Daily Traffic (AADT) of the three sections increased 6 to 18 times between 2005 and 2008. Likewise the Passenger Car Unit (PCU⁷) of the three sections increased 4 to 18 times in the same period (see Table 3). For the purpose of reference, this ex-post evaluation survey conducted a 24-hour sample traffic count in Jepara. As shown in Table 4 below, the surveyed traffic volume was 16,675 in AADT and 10,304 in PCU. The ratio of motorcycles was 81% of the total traffic, implying that the use of motorcycles was promoted by the widening of the road and the improvement of the road surface under the project. The traffic volume of the three sections commonly increased after 2007 when over 80% of the entire target section was completed, and particularly there was an outstanding increase in the traffic volume of the Jepara – Seputih Banyak section (CA-2). The possible reasons for this are that the Jepara – Seputih Banyak section is located in the populated area including Jepara and Sukadana towns and more and more local people became to use this target road as their community road. It is supported by the result of the sample traffic count that about 80% of the traffic consisted of motorcycles. Whilst from the viewpoint of the role of the target road as an alternative distribution route in the entire Lampung Province, the utilization of the target road for this purpose is still limited because a part of the section is still incomplete.

Table 3: Traffic Volume

Section	km	2005	2006	2007	2008	Growth rate vs. 2005
AADT (No. of vehicle/day/year)						
(CA-1) Ketapang – Jepara	69.5	2,566	2,679	9,984	15,488	604%
(CA-2) Jepara – Seputih Banyak	60.1	1,180	1,224	13,860	21,609	1,831%
(CA-3) Seputih Banyak – Manggala	56.5	1,180	4,638	4,834	7,537	639%
PCU (PCU/day/year)						
(CA-1) Ketapang – Jepara	69.5	1,818	1,900	5,644	8,756	482%
(CA-2) Jepara – Seputih Banyak	60.1	727	754	8,642	13,473	1,853%
(CA-3) Seputih Banyak – Manggala	56.5	727	1,525	2,944	4,590	631%

Source: Bina Marga, Ministry of Public Works

⁷ PCU (Passenger Car Unit) is a transport engineering term to convey the heterogeneous traffic concept (i.e. passenger cars) as opposed to the homogeneous traffic concept (i.e. trucks, buses, passenger cars, motorcycles, etc) by using a conversion factor. In Bina Marga, the Ministry of Public Works adopts the conversion factors for each type of vehicles as 1.0 for passenger car, 0.5 for motorcycles, and 1.3 for heavy vehicles.

According to JICA's Development Study of Coastal Roads on the East Coast of Sumatra (1992), the estimated traffic volume of the target section in 2010 was estimated as 18,000 PCU/day. If the actual PUC of each section in 2008 in Table 3 is compared with the estimated PCU in 2010, the achievements for each section are 48%

in the Ketapang – Jepara section (CA-1), 75% in the Jepara – Seputih Banyak section (CA-2) and 26% in the Seputih Banyak – Manggala section (CA-3)⁸.

However, considering the fact that a part of the project section was still incomplete as of April 2009, assessment of the degree of achievement in traffic volume at the time of ex-post evaluation should be made some reservations. It is expected that after the completion of the entire target section in December 2009, when travelling from Bakauheni port in Lampung Province to Palembang in South Sumatra Province, it will be faster and more convenient to use the east coast detour route of Bakauheni – Jepara – Seputih Banyak – Manggala than the existing route of Bakauheni – Bandar Lampung – Gunungsugi – Manggale which is usually congested. Since the number of cargo trucks and vehicles for the distribution of goods is expected to increase in the project area, it is also estimated that there will be an increase in the traffic volume in the target section of the project. It is therefore possible that the target traffic volume of 18,000 PCU/day will be achieved by the end of 2010.

Meanwhile, according to statistical data of traffic volume at major roads in Lampung Province in 2007, the highest traffic volume (AADT) in Lampung Province was 23,000 vehicles/day at Tanjungkarang, which is located in the center of Bandar Lampung, capital city of the province. When comparing this AADT with the AADT for Jepara – Seputih Banyak which were 13,860 vehicles/day in 2007 and 21,609 vehicles/day in 2008, there is no large gap between these two AADTs. Particularly after 2007 when improvement work for the majority of the target section was progressing, a dramatic expansion in the traffic volume was observed. Hence it can be concluded that the project has brought about the expected outcome to some degree.

Table 4: Result of Sample Traffic Count

1. Date	20-21 April 2009 (24 hours)
2. Place	Inside Jepara
3. Traffic Volume	16,675 vehicle/day 10,304 PCU/day
4. Break-down	Motorcycles: 13,449 (81%) Jeeps, sedans, wagon cars: 1,855 (11%) Small wagon cars: 191 (1%) Mini-buses, large buses: 123 (0.7%) Trucks: 1,057 (6.3%)

Source: Ex-post evaluation team.

⁸ The information regarding the traffic volume estimation for each target section for each year was not available in the appraisal documents. Therefore, the estimated traffic volume of the target section in 2010, which is 18,000 PCU/day, described in the JICA's Development Study was used as a reference to measure the achievement of the traffic volume.

However, there are concerns that there is no progress on the planned improvement of the Manggala – Pasir - Pematang Panggang section (77.6km) which directly links with the target section, and this may have a negative effect on the sustainability of the project outcome. The Indonesian government must continue to make efforts to realize the improvement of the above section⁹.

2.3.2 Savings in travelling time and the improvement of velocity

Although exact data regarding travelling time and velocity in the target section before and after project implementation is lacking, according to an interview survey by people from the executing agency who were directly in charge of project implementation, the travelling time in the Ketapang – Manggala section shortened from 435 minutes (7 hours 15 minutes) to 191 minutes (3 hours 11 minutes), and velocity improved from 26 km/hour to 60 km/hour comparing before and after project implementation (see Table 5). It can be seen that the cars were able to travel the target section in less than half the time after the project implementation¹⁰. Considering the fact that part of the target section was still incomplete as of April 2009, it can be expected that the positive effects of saving of travelling time and the improvement of velocity will be further increased after the completion of the entire project target section in December 2009.

Table 5: Travelling Time and Velocity

Section	km	Before Project		After Project (April 2009)	
		Travelling time (minutes)	Velocity (km/hour)	Travelling time (minutes)	Velocity (km/hour)
(CA-1) Ketapang – Jepara	70	120	35	87	48
(CA-2) Jepara – Sukadana	30	45	40	50	36
(CA-3) Sukadana – Manggala	90	270	20	54	100
Total	190	435	26	191	60

Note: Travelling time and velocity before the project implementation are based on the results of an interview survey to the executing agency.

⁹ The detailed design of this section was already completed by the consulting services of the project. Although the periodic maintenance such as patching, cleaning of the drainage facilities, and overlay has been carried out by the executing agency using the Indonesian government's own fund and the financial assistance of the Asian Development Bank (ADB), a part of this section is still badly damaged due to the heavy traffic exceeding 8t of the design weight of the road. The executing agency anticipates that the land acquisition of this section will be easier than that of the project (i.e. the Ketapang-Manggala section) since the majority of land is owned by the state-owned plantation company and many immigrants from Java island live along this section. However, the improvement work of this section has not yet started due to a difficulty in arrangement of the project budget.

¹⁰ The possible reasons why the travelling time and velocity of the Jepara – Sukadana section are not improved after the project implementation are: (i) the dramatic traffic volume expansion to 18 times of this section might compensate the expected positive effects on the travelling time and velocity of this section, and (ii) the lower car speed is enforced at many locations of this section than other two sections since this section is located in the populated area including Jepara and Sukadana towns.

2.3.3 Results of Economic Internal Rate of Return (EIRR)

The Economic Internal Rate of Return (EIRR), based upon a cost-benefit analysis at the time of appraisal, was 18.2%. The re-calculated EIRR adapting the same preconditions (i.e. cost: project cost and operation and maintenance cost; benefit: saving of vehicle’s operation cost and time saving cost) of cost-benefit analysis at the time of appraisal was 8.4% at the time of ex-post evaluation¹¹. It is difficult, however, to identify the reasons why the re-calculated EIRR at the time of ex-post evaluation is lower than the original EIRR at the time of appraisal due to lack of detailed information on the original data. Possible factors for the lower re-calculated EIRR might be associated with the increase in project cost, the difference in the unit costs for saving of vehicle’s operation and time saving, and the difference in the traffic volume estimation between the appraisal and ex-post evaluation. But it is not certain.

2.3.4 Satisfaction level of the project beneficiaries

According to the results of a satisfaction survey of local residents, local transporters, and local businesses, 44.9% of respondents (79 respondents) said that they were “Very much satisfied”, 39.2% of respondents (69 respondents) answered “Yes, satisfied to some extent”, 10.2% of respondents (18 respondents) said “Not much satisfied”, and 5.1% of respondents (9 respondents) replied “Not satisfied at all”. Considering the fact that more than 80% of the total respondents answered either “Very much satisfied” or “Yes, satisfied to some extent”, it can be assumed that the project met the needs of the beneficiaries.

Table 6: Satisfaction Level of Beneficiaries

Satisfaction level	Local Residents		Local Transporters	Local Businesses	Total	
	Male	Female			No. of Responses	%
Very much satisfied	11	9	31	28	79	44.9%
Satisfied to some extent	9	5	25	30	69	39.2%
Not much satisfied	1	0	10	7	18	10.2%
Not satisfied at all	0	0	1	8	9	5.1%
Do not know	0	0	1	0	1	0.6%
Total	21	14	68	73	176	100%

Source: The results of the beneficiary survey conducted by the ex-post evaluation team.

¹¹ The operation and maintenance cost, saving of vehicle’s operation cost and time saving cost used for the calculated EIRR are referred from the information in “Project Benefit Monitoring Evaluation Report: JBIC IP-487, 2008” prepared by the executing agency.

2.4 Impact

2.4.1 Impact on commodity distribution and the movement of people

The main industries in the project area are plantations producing pineapple, sugarcane, tapioca, banana, rubber and pulp and the aqua-culture of prawns. Products are exported to overseas markets or transported to domestic markets in major cities like Jakarta through Bakauheni port. Since the project target road plays an important role in transporting produce, it can be said that the project contributed to the improvement of commodity distribution and the movement of people to a certain degree.

The transport volume of ferry boats between Bakauheni in Sumatra and Merak in Java has also been increasing year by year¹². For example, the number of cars transported by ferry increased about two times from 3,471 vehicles/day in 2003 to 7,035 vehicles/day in 2007 (see Table 7). With a constant increase in the number of vehicles transported by ferry through Bakauheni port linking with the project target section, the traffic volume in Lampung Province travelling between Sumatra and Java is also increasing. It is expected that after the completion of the entire section of the project in December 2009, more and more cargo trucks and transporters will begin use the target section of the project as a detour route in order to avoid traffic congestion on the existing route of Bakauheni – Bandar Lampung – Gunungsugi – Manggale. Therefore, the role of the project in the promotion of commodity distribution in the region will be more important.

Table 7: No. of Passengers and Vehicles transported by Ferry between Bakauheni and Merak

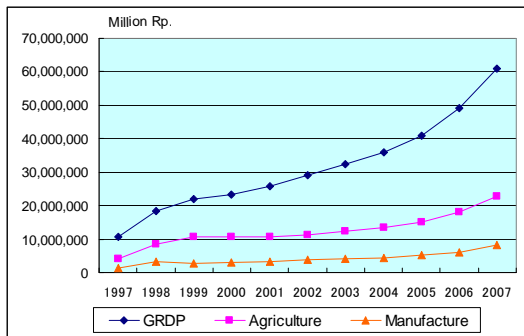
		2003	2004	2005	2006	2007
No. of passengers	Annual	9,042,844	9,376,520	4,630,963	5,697,428	3,582,201
	Daily Average	24,775	25,689	12,688	15,609	9,814
No. of vehicles	Annual	1,267,082	1,428,862	1,658,939	2,338,702	2,567,714
	Daily Average	3,471	3,915	4,545	6,407	7,035

Source: Ferry Company.

2.4.2 Impact on the local economy and regional development

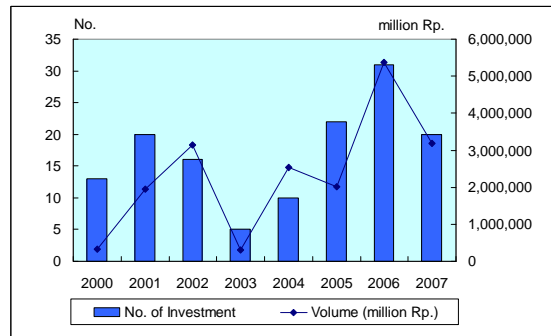
The Gross Regional Domestic Product (GRDP), the agricultural output and the industrial output in Lampung Province have increased stably since 1997. Also the volume and the number of foreign and domestic investments in Lampung Province have shown an upward trend after 2004 (see Figure 3 and 4).

¹² The construction of ferry terminals and related facilities in Bakauheni and Merak ports was financed by three Japanese ODA loan projects: (i) the Lampung - Merak Road and Ferry Terminal Project (ferry terminal component in 1976 (2,300 million yen, completed 1981), (ii) the Bakauheni - Merak Ferry Terminal Extension Project in 1985 (2,200 million yen, completed 1988), and (iii) the Merak - Bakauheni Ferry Terminal Extension Project (2) in 1993 (4,580 million yen, completed in 2002). (Source: ex-post evaluation report on Merak - Bakauheni Ferry Terminal Extension Project (2)).



Source: Lampung Province Statistic Department.

Figure 3: GRDP, Agricultural and Industrial Output in Lampung Province (Constant Price)



Source: Lampung Province Statistic Department.

Figure 4: Foreign and Domestic Investment in Lampung Province

After 2007 the establishment of new factories and the development of economic and commercial activities have been observed along the area of the project target road. For example, two large-scale sugar refinery factories in Menggala and Seputih Banyak, a large-scale tapioca processing factory in Seputih Banyak, and two small factories in Purbalingga located at the middle point between Seputih Banyak and Sukadana have been newly established. Similarly the number of businesses has increased.

Table 8 indicates the number of registered foreign and domestic companies in the four regencies in Lampung Province where the project target road is located. The number of registered companies increased 10 times between 2000 (before the project) and 2008 (after the project). The number of commercial services such as shops, restaurants, petrol stations and car repair workshops expanded along the project target road. The result of the beneficiary survey says that the increase in new business and the expansion of business opportunities have been widely noted by the beneficiaries. Therefore, it can be concluded that the project played a key role in facilitating regional development in the target area.

Table 8: Number of Registered Companies in the Four Regencies in the Project Area

Regency		2000	2001	2002	2003	2004	2005	2006	2007	2008
Tulang Bawang	Foreign	0	0	0	0	0	4	6	6	6
	Domestic	2	3	3	4	4	8	11	11	14
Central Lampung (Lampung Tengah)	Foreign	2	3	4	4	7	9	12	14	15
	Domestic	1	6	6	11	11	13	14	15	15
East Lampung (Lampung Timur)	Foreign	0	0	0	0	0	3	3	3	4
	Domestic	0	0	0	0	0	1	2	3	3
South Lampung (Lampung Selatan)	Foreign	1	2	2	5	6	12	14	14	14
	Domestic	3	10	11	11	17	19	23	24	24
Total		9	24	26	35	45	69	85	90	95

Source: Lampung Province Statistic Department.

2.4.3 Improvement in living standard of the local residents

According to the results of the beneficiary survey, the promotion of business activities and increases in income as well as the improvement of access to various services such as hospitals, schools and health care services were recognized as major positive changes. As explained above, economic and commercial activities were promoted and the convenience for residents improved along the project target road after 2007. Therefore, it can be assumed that the project contributed to the improvement of living standards for local residents.

2.4.4 Traffic accidents

Although statistical data of traffic accidents is only available for the period after 2007, the number of traffic accidents in the four regencies of the target area dramatically increased - about three times - from 187 in 2007 to 584 in 2008, and the number of deaths increased accordingly (see Table 9). Whilst traffic accidents in Lampung Province also increased from 1,363 in 2007 to 1,562 in 2008, 26% of the total traffic accidents and 32% of the total deaths were concentrated in the Tulang Bawang Regency and the Central Lampung (Lampung Tengah) Regency. Since Table 9 shows the total number of traffic accidents in both regency and province, individual traffic accident data for particular target sections cannot be identified. However, considering the fact that the number of traffic accidents in the four regencies increased after 2007 when the project was nearly completed, it can be assumed that quite a few number of traffic accidents occurred along the target project road belong to the number of the traffic accidents in the four regencies. Since the increase in traffic accidents was raised by the beneficiaries as one of the major changes after project implementation in the results of the beneficiary survey, there must be a high possibility that there was an increase in traffic accidents along the target project road after the project implementation in comparison with the situation before project implementation. According to the Lampung Province Police Authority, the major cause of accidents is speeding.

Table 9: Number of Traffic Accidents in the Project Area and Lampung Province

Regency and City	2007		2008		Jan. 2009		Feb. 2009		Mar. 2009	
	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths
Tulang Bawang	56	65	207	96	11	2	15	8	12	10
Central Lampung	15	14	206	109	8	6	7	5	9	8
East Lampung	57	60	94	84	7	7	8	12	4	2
South Lampung	59	66	77	91	4	4	6	5	7	9
Sub-total	187	205	584	380	30	19	36	30	32	29

Regency and City	2007		2008		Jan. 2009		Feb. 2009		Mar. 2009	
	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths	No. of Accidents	No. of Deaths
Bandar Lampung	855	96	691	78	47	12	53	4	47	12
North Lampung	46	45	111	93	7	3	7	5	8	6
West Lampung	36	32	66	16	0	0	7	2	4	4
Tanggamus	38	31	n.a.	n.a.	9	3	8	1	17	11
Way Kanan	27	26	59	61	3	4	5	2	4	3
Metro	174	92	51	14	6	1	5	1	7	1
Total	1,363	527	1,562	642	102	42	121	45	119	66

Source: Lampung Police Authority.

The issue of the recent rise in traffic accidents has been well recognized by the Lampung Provincial Authority, and they have been taking measures for traffic accident prevention such as the installation of traffic lights and traffic signs, the improvement of inter-changes, and the promotion of traffic safety campaigns.¹³

2.4.5 Impact on the natural environment

An Environmental Impact Assessment was not conducted, though a brief survey had already been conducted at the time of appraisal. According to the beneficiary survey of local transporters and businesses (sample size: 141) in the ex-post evaluation survey, 50% of respondents answered that there had been environmental impacts (of which 27% of the respondents replied “very much” and 23% replied “to some extent”). The perceptions of the above respondents to dimensions of the environmental impact were: “increase in air pollution (65%)”, “increase in noise (83%)” and “increase in vibration (69%)” after project implementation. However, as environmental data was not collected in the project area, an analysis of whether actual data surpasses environmental standards is not available. Due to the lack of objective data, the beneficiaries’ opinion cannot be referenced.

According to the executing agency of the project, the installation of environmental monitoring equipment and the conducting of environmental monitoring activities during project implementation became compulsory for all road development projects in Indonesia which had contracts signed after 2009. For this project, the environmental monitoring equipment at a station located in 3km from Sribawono towards Jepara was

¹³ Examples of the traffic safety measures are: (i) the installation of one unit of traffic lights between Sribawono and Jepara in 2010, (ii) the installation of 500 units of traffic signs between Bahauheni and Menggala, (iii) the improvement of the inter-change at Menggala, (iv) the implementation of a weekly traffic safety campaign for all regencies and cities in Lampung Province for one year after 2009. The components of the traffic safety campaign are: the organization of a driving skill course and the distribution of booklets on safe driving, the wearing of helmets, safe walking and the safe road crossing of pedestrians. In addition, traffic safety activity has been conducted in collaboration with local governments every three months.

already installed and its operation is scheduled to start from September 2009.¹⁴

2.4.6 Impact on the social environment associated with the resettlement of residents and land acquisition

At the time of ex-post evaluation the acquisition of 85.7 ha, which is equal to 91.5% of planned area for land acquisition, was complete. According to the executing agency of the project, the remaining 7.93ha of land was scheduled to be acquired by August 2009. The number of households compensated totalled 427 including 400 households in the Ketapang – Jepara section (CA-1) and 27 households in the Jepara – Seputih Banyak section (CA-2). In general, compensation was in money. Most of the land owners sold a part of their compounds; hence there was no relocation of buildings except for 7 or 8 cases (see Table 10).

The main reason for the substantial delay in the project period and even now in the construction work for a part of the target section was the prolonged land acquisition process. The primary reason for the prolonged land acquisition process was the delay in preparing the required land acquisition budget by the central and local governments. In principle the land acquisition cost was to be shared equally by the central and local governments. However, due to the financial difficulties of the provincial and regional governments, for example, the arrangement of the land acquisition budget became difficult. A difficulty in the negotiation with the land owners of compensation prices was also one of the reasons that caused delay. Finally, a measure to prevent further delay was taken by the executing agency through the taking over of the financial obligation of local governments for the land acquisition through a special budgetary arrangement with the central government after 2008.

Table 10: Comparison of Planned and Actual Land Acquisition

Section and Regency	Length (km)	Plan		Completed		On-going	
		Area (ha)	Build -ing	Area (ha)	Build -ing	Area (ha)	Build -ing
(CA-1) Ketapang - Jepara							
South Lampung	14.8	4.97	110	4.97	100	-	10
East Lampung	54.7	17.77	173	14.54	134	3.23	39
(CA-2) Jepara - Seputih Banyak							
East Lamoung	51.8	31.32	181	26.62	102	4.70	79
Central Lampung	8.3	1.50	9	1.50	9	-	-
(CA-3) Seputih Banyak - Manggala							
Central Lampung	39.4	17.65	24	17.65	24	-	-
Tulang Bawang	17.7	20.42	3	20.42	3	-	-
Total	186.1	93.63	500	85.7 (91.5%)	372 (74.4%)	7.93	128

Source: Bina Marga, Ministry of Public Works

¹⁴ The purpose of the installation of the environmental monitoring equipment is to monitor air pollution near the station as there is an asphalt production factory near Sribawono.

It should be noted that there still exists a pending case on land acquisition with the Hindu temple and Hindu community located in the Ketapang – Jeparu section (CA-1)¹⁵. According to the executing agency, negotiations with the Hindu temple and community have been proceeding only with difficulty, and the resolution of this issue was not expected by August 2009. If there is no progress in the negotiation process in 2009, the executing agency plans to take appropriate legal action. Therefore, it is necessary to continue monitoring progress of the remaining land acquisition.

Summary Results of Beneficiary Survey Conducted in this Ex-Post Evaluation

In the ex-post evaluation of the “Sumatra East Coast Highways”, a questionnaire survey and group interviews (Focus Group Discussions) with the beneficiaries were carried out. A summary of the results of the beneficiary survey is as follows.

<Focus group discussion with local resides living along the project target road>

- (1) Place: Jeparu
- (2) Time: April 2009
- (3) Target group: Local residents near Jeparu
- (4) No. of samples: 35 (21 male and 14 female)

(5) Top Five “Changes” that Participants Consider Most Important

Male group: 21 participants		Female group: 14 participants	
	No. of vote		No. of vote
1. Increase in business and income	23	1. Increase in traffic accidents	11
2. Change of driving attitude and discipline (become worse)	20	2. Expansion of economy	7
3. Increase in traffic accidents	10	3. Improvement of driving comfort	7
4. Increase in inter-town connections	8	4. Increase in job opportunities	6
5. Increase in social and cultural changes	2	5. Increase in investment	4

Note 1: At first, all the participants discussed the key question, “How has the project changed your life?” and major common changes were extracted through group discussion. Then each participant, who had three votes, was asked to allocate their votes to the “changes” that they thought most important.

Note 2: Focus Group Discussions were organized separately for male and female groups.

(6) Results of Analysis

- Positive changes in economic aspects such as the increases in business, income and job opportunities, and in investment were commonly recognized.
- At the same time, negative impacts such as the increase in traffic accidents and changes in driving attitudes and discipline were perceived.
- It can be assumed that factors such as the increase in traffic volume and velocity, coupled with the lack of traffic safety education and awareness of the drivers, increased the risk of traffic accidents.

¹⁵ The land to be acquired from the Hindu temple is approximately 3,000 square meters of land which makes up part of the compound but does not include buildings. According to the executing agency, the Hindu temple and Hindu community request as a condition of selling their land that not only compensation for the land, but also provision of the entire reconstruction costs of the temple.



FG male group

FG female group

Voting

<Questionnaire survey to local businesses and transporters >

- (1) Place: Ketapang-Menggala section
- (2) Time: April 2009
- (3) Target group: Local businesses and transporters
- (4) No. of samples: 141 (73 businesses and 68 transporters)

(5) Results of Analysis

- 90% of businesses perceived an increase in the convenience of traffic after project implementation. Major reasons for this answer were: time saving (74%), reduction of vehicle operation costs (17%), reduction of traffic congestion (15%) and so on.
- 70% of businesses recognized the socio-economic impact of the project. These were: increase in new business activities (80%), increase in accessibility to a variety of services (78%), increase in business opportunities (72%), increase in land prices (94%), increase in population (92%) and so on. It can be assumed that the project contributed to the promotion of commercial activities and the activation of the local economy in the project area after the project implementation.
- 60% of transporters recognized an increase in traffic volume after project implementation. In addition, 94% of transporters perceived an increase in the volume of freight vehicles such as trucks.
- 50% of transporters saw an increase in the frequency of transport services, but 44% of them replied that this was unchanged.
- 85% of transporters recognized time saving after project implementation.
- 65% of transporters thought that the number of traffic accidents had increased. They analyzed the causes of traffic accidents as: speeding (20%), drivers' bad manners (15%), increase in traffic volume (7%), lack of traffic signs (4%) and so on.

<Opinions and recommendation for the project from beneficiaries>

- A major common opinion expressed by local residents, businesses, and transporters was the necessity for the installation of fly-overs, traffic lights, and street lights for traffic accident prevention along the project target road. Also, the necessity for better periodic maintenance of roads and bridges was suggested.

2.5 Sustainability (Rating: a)

No major problem has been observed in the capacity of the executing agency nor its operation and maintenance (O&M) systems; therefore, sustainability of the project is high.

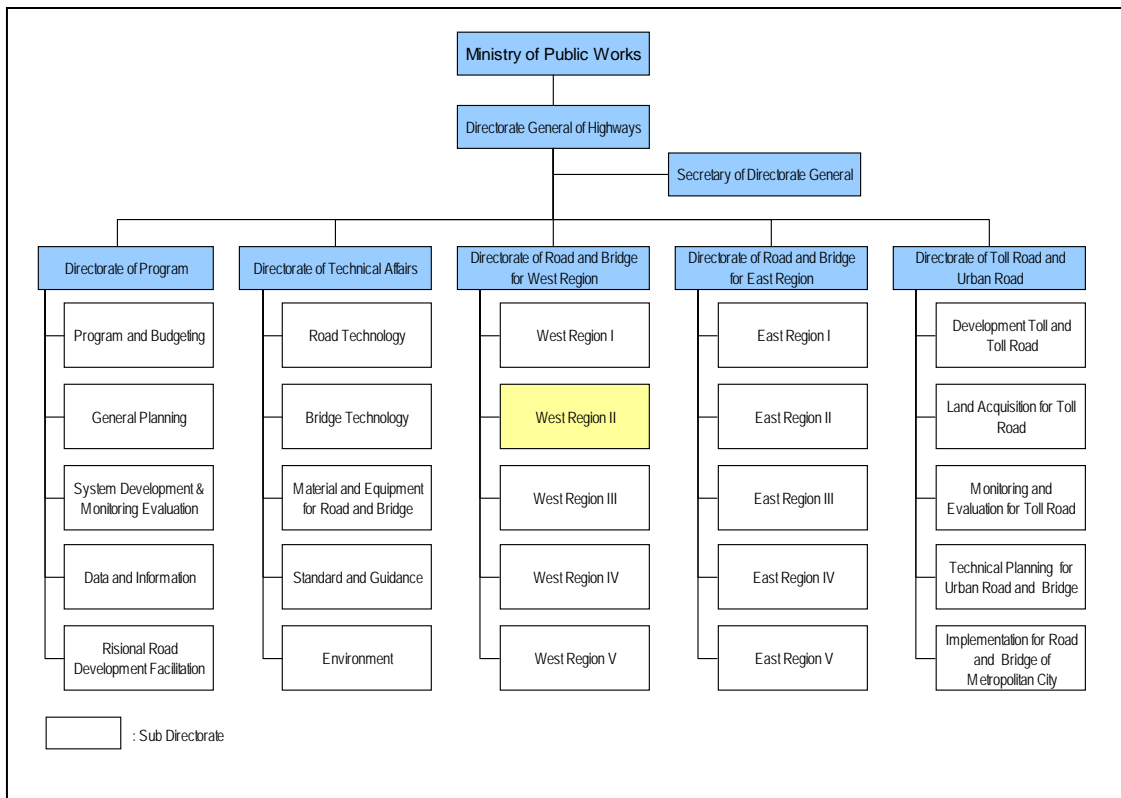
2.5.1 Executing Agency

2.5.1.1 Structural Aspects of Operation and Maintenance (O&M)

The executing agency for operation and maintenance (O&M) of the project is the

Directorate General of Highways (Bina Marga), Ministry of Public Works. In particular, the Sub-Directorate of the West Region II (Balai Beswar II) under the Directorate of Roads and Bridges for the West Regions is directly in charge of O&M of the project target section (see Figure 5).¹⁶ Balai Beswar II is responsible for the supervision of roads in its territorial area including the project target road. Balai Beswar II makes decisions about O&M work plans while the Bina Marga head office decides which sections require maintenance by using the road management system. Balai Beswar II collects and reports on data for the road management system and, meanwhile, the Bina Marga head office administrates the database. It can be concluded that there is no problem in the O&M system as the managerial responsibilities for O&M are clear.

Figure 5: Organizational Chart of Directorate General of Highways (Bina Marga)



2.5.1.2 Technical Aspects of Operation and Maintenance

Balai Basar II has approximately 15 engineers. As these engineers belong to Balai Basar II directly, they can visit the sites frequently and become accustomed with crucial

¹⁶ At the time of appraisal, it was expected that the department of public works in Lampung Province would maintain roads while the regional offices of the Ministry of Public Works would conduct O&M planning or give technical guidance to the province. After the resignation of President Soeharto in 1998, as a result of the review of administrative organization, regional offices (Balai) which are in charge of more than one province under Bina Marga take charge of routine maintenance (inspections, cleaning up, minor civil works, etc.), periodic maintenance and emergency maintenance of roads. Ten Balai are placed across Indonesia.

information such as landform and soil condition. Meanwhile, this system allows Balai Basar II to use the technical knowledge of engineers at regional level. Engineers directly under Balai Basar II are given training for assessment of road condition, survey methods of traffic volume, electronic procurement, project management, quality control, and etc.

2.5.1.3 Financial Aspects of Operation and Maintenance

The O&M cost for the project target section is allocated from the central government general budget. After the O&M budget in FY2008, budget allocation was over 120% of that planned by RENSTRA of the Ministry of Public Works (see Table 11). Budget allocation has increased since 2005 and it has become clear that there is more focus on road maintenance.

Table 11: Operation and Maintenance Budget
(Total of daily maintenance and regular maintenance)

(unit: billion Rp.)

	2005	2006	2007	2008	2009
RENSTRA (planned)	8,400	9,700	11,400	13,100	15,100
Budget allocation	5,900	7,300	9,800	16,000	19,000
% of sufficiency	70.2%	75.3%	86.0%	122.1%	125.8%

Source: Bina Marga, Ministry of Public Works

2.5.2 Current Status of Operation and Maintenance

Bina Marga classifies Indonesian road conditions into the following four types using the International Roughness Index (IRI), which is the index for showing the unevenness of roads. IRI is often used as a benchmark in preparing maintenance plans.

- IRI 0-4 m/km : Good - Appropriate for daily maintenance
- IRI 4-8 m/km : Fair - Appropriate for regular maintenance
- IRI 8-12 m/km : Poor - Appropriate for rehabilitation
- IRI >12 m/km : Bad - Appropriate for reconstruction including the sub-base

IRI for the project target sections are shown in Table 12. Except for the Bunt (Ketapang) – Labuha Maringgai section, the road conditions of all sections are classified either “Good” or “Fair”. A possible reason why the IRI at Bunt (Ketapang) –Labuha Maringgai was 8.14 (Poor), was that a part of the section is still incomplete and the old deteriorating road surface remained in some sections. At present, Bina Marga has implemented a project for the installation of weighting stations in Indonesia financed by the World Bank, and they plan to install a weighting station near Ketapang by 2011.

Table 12: IRI for the Project Target Section

Section	Location	IRI (2007)
(CA-1) Ketapang – Jepara	Bunt (Ketapang) –Labuha Maringgai	8.14
(CA-2) Jepara – Seputih Banyak	Sukadana – Purbolinggo	4.13
(CA-2) Jepara – Seputih Banyak (CA-3) Seputih Banyak – Manggala	Purbolinggo – Mandala	3.2
(CA-3) Seputih Banyak – Manggala	Mandara – Bujung Tenuk	3.47

Source: Bina Marga, Ministry of Public Works

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

Whilst the relevance of the project is high due to the high consistency between the project objective and Indonesian development policy and development needs, the efficiency of the project was low as project completion was delayed and project costs increased against the plan. After project implementation, expected project effects such as an increase in traffic volume, savings in travelling time, and an increase in velocity were observed. Also, impacts on the promotion of commodity distribution and the movement of people and impacts on the local economy and regional development were recognized. The sustainability of this project is high in terms of the O&M system, technology, and finance by the executing agency as the roads improved by the project are maintained in good condition. In light of the above, this project is evaluated to be satisfactory.

3.2 Lessons learned

In this project, the difficulty of local government in budgeting for land acquisition was one of the major factors which caused delay in project implementation. Despite the fact that the expiry period of the loan agreement was extended, as a result of this delay the project could not be completed by the extended project period. Financial issues are expected finally to be cleared by the arrangement of a special central government budget to be used for the purchase of remaining land after 2008. If such a counter measure had been taken in an early stage, the project would have been completed before the expiry period of the loan agreement.

Insufficient information sharing on the land acquisition process between the executing agency and the local governments revealed the problem of project monitoring. It would be preferable to establish a system to carry out land acquisition smoothly by assigning certain staff to land acquisition monitoring in the executing agency and by

improving the capability for monitoring land acquisition through training, specialist dispatch and the consulting service of the ODA loan projects.

Furthermore, JICA, who is responsible for project monitoring as a financier, should carefully assess the feasibility of land acquisition at the project appraisal and implementation stages.

3.3 Recommendations

As the increase in traffic accidents has become a social issue, Lampung Provincial Government and the local police authority should continue to actively promote effective traffic safety measures such as the installation of traffic lights and road signs as well as the implementation of traffic safety education campaigns.

Comparison of Original and Actual Scope

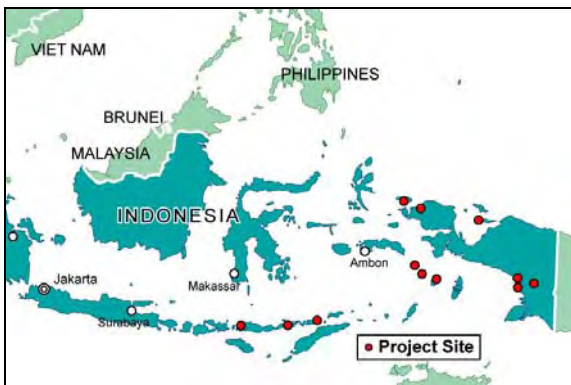
Item	Original	Actual
<p>(1) Outputs</p> <p>a) Road improvement by widening and upgrading of roads</p> <ul style="list-style-type: none"> • (CA-1) Ketapang – Jepara • (CA-2) Jepara – Seputih Banyak • (CA-3) Seputih Banyak – Manggala <p style="margin-left: 40px;">Total: 168 km</p> <p>b) Rehabilitation and construction of bridges</p> <ul style="list-style-type: none"> • (CA-1) Ketapang – Jepara • (CA-2) Jepara – Seputih Banyak • (CA-3) Seputih Banyak – Manggala <p style="margin-left: 40px;">40 bridges (964m)</p> <p>c) Consulting services</p> <ul style="list-style-type: none"> • Detailed design • Assistance for tender • Construction supervision • Technical advisory service to the executing agency 	<p>68 km</p> <p>50 km</p> <p>50 km</p> <p>23 bridges (527m)</p> <p>11 bridges (172m)</p> <p>6 bridges (265m)</p> <p>Foreign consultant: 75 M/M Local consultants: 314 M/M</p>	<p>69.5 km</p> <p>60.1 km</p> <p>56.5 km</p> <p>Total: 186.1 km</p> <p>(note) A total 24km of the road, which consist of 22.7km in the Ketapang – Jepara section and 1.3km in the Jepara - Seputih Banyak section was incomplete as of May 2009.</p> <p>28 bridges (700m)</p> <p>11 bridges (170m)</p> <p>6 bridges (265m)</p> <p>45 bridges (1,135m)</p> <p>Foreign consultant: 104 M/M Local consultants: 528 M/M</p>
<p>(2) Project period</p> <ul style="list-style-type: none"> • Signing of loan agreement • Selection of consultant • Selection of contractor • Land acquisition • Civil works • Consulting services 	<p>Nov. 1997</p> <p>Oct. 1997-Sep. 1998 (12 months)</p> <p>May 1999-Nov. 2000 (19 months)</p> <p>Aug. 1999-Nov. 2000 (16 months)</p> <p>Apr. 2001-Mar. 2003 (36 months)</p> <p>Sept. 1998-Mar. 2003 (55 months)</p>	<p>Jan. 1998</p> <p>Oct. 1998-July 1999 (10 months)</p> <p>Nov. 2000-Dec. 2002 (26 months)</p> <p>Jan. 2000-Aug. 2009 (estimates) (104 months)</p> <p>Dec. 2002-Dec.2009 (estimates) (85 months)</p> <p>Sept. 1999-Dec. 2006 (88 months)</p>
<p>(3) Project cost</p> <p>Foreign currency</p> <p>Local currency</p> <p>Total</p> <p>ODA loan portion</p> <p>Exchange rate</p>	<p>5,300 million Yen</p> <p>3,569 million Yen (68,635 million Rp.)</p> <p>8,869 million Yen</p> <p>6,652 million Yen</p> <p>1 Rp.=0.052 Yen (April 1997)</p>	<p>n.a. million Yen</p> <p>n.a. million Yen (n.a. million Rp.)</p> <p>11,627 million Yen</p> <p>4,763 million Yen</p> <p>1 Rp. = 0.014 Yen (Weighted average between 1997-2006)</p>

Indonesia

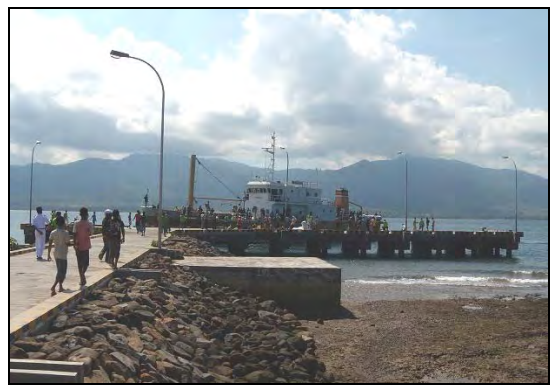
Ex-post Evaluation of Japanese ODA Loan Project
“Small Ports Development Project in Eastern Indonesia”

External Evaluator: Nobuyuki Kobayashi
(OPMAC Corporation)
Field Survey: June 2009

1 . Outline of the ODA Loan Assistance



Map of the project area



Wharf at Menanga constructed by this project

1.1 Background

Indonesia is an archipelagic nation stretched over 17,000 islands across 1,800km from north to south and 5,100km from east to west. With such a geographical environment, maritime transport is important in passenger/freight transport and in communication. Furthermore, from the viewpoint of reducing regional disparities, maritime transport plays a vital role in regions where road transportation is not available. Since 1974, the Government of Indonesia has supported the operation of unprofitable sea routes by subsidizing routes calling at non-commercial ports (small-scale ports). The regular sea routes with government support are named “Pioneer Routes” and contribute to the improvement of the living standards of local people and the development of the economy in remote areas. At the time of the appraisal of this project (as of 1997), 36 sea routes were designated as Pioneer Routes, of which 29 routes called at 140 non-commercial ports located in Eastern Indonesia. However, since many of these non-commercial ports did not have basic port facilities such as moorings, these ports were neither efficient nor safe enough to call at, for the embarking/disembarking of passengers, and the loading/unloading of cargo. Therefore, in order to offer a marine transport service in the eastern region, the development of port facilities was urgent. The project target areas, East Nusa Tenggara, Maluku, West Papua, and Papua, are located in the economically underdeveloped eastern region of Indonesia and include vast areas (such as

islands or tropical rainforest areas) hardly accessible by land transport.

1.2 Objective

The objective of this project is to enhance the efficiency of maritime transportation and improve safety by improving facilities such as moorings in 12 non-commercial ports in East Nusa Tenggara, Maluku, West Papua and Papua, thereby contributing to the promotion of economic and social development in the above provinces.

1.3 Borrower / Executing Agency

Government of Indonesia / Directorate General of Sea Communication, Ministry of Transportation (DGST)

1.4 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	3,111 million yen / 2,590 million yen
End Notes Exchange Date / Loan Agreement	January 27, 1998 / January 28, 1998
Terms and Conditions	Interest Rate: 2.7% (Consultant Portion 2.3%) Repayment Period: 30 years (Grace Period: 10 years) Procurement: General Untied
Final Disbursement Date	September 25, 2005
Main Contractor (Over 1 billion yen)	—
Main Consultant (Over 100 million yen)	Pacific Consultant International (Japan) • PT RAYA SURINDO (Indonesia) • PT RAYAKONSULT (Indonesia) (JV)
Feasibility Studies, etc. (F/S)	None
Related Projects	None

2. Evaluation Results (Rating : C)

2.1 Relevance (Rating: a)

This project has been highly relevant with Indonesia's national policies and development needs at the times of both appraisal and ex-post evaluation.

2.1.1 Consistency with Indonesia's Development Policy

At the time of appraisal, the Sixth Five Year National Development Plan (REPELITA VI, 1994 – 1998) emphasized the importance of the development of the economically

underdeveloped eastern region from the viewpoint of reducing economic disparity among regions. In addition, in order to encourage development and economic growth in remote places, the improvement of facilities in non-commercial ports was a major objective in development policy. The Government of Indonesia had the policy of improving underdeveloped ports within 10 years. Out of 556 non-commercial ports, 286 ports did not have adequate mooring facilities.

At the time of ex-post evaluation, the reduction of regional disparity was one of the most important objectives in the Medium-Term National Development Plan (PRJM 2004–2009). It can be seen that there are still substantial differences between urban and non-urban areas, Java and other areas, and Western and Eastern Indonesia. PRJM also considers the maritime service to offer a highly reliable traffic service and to contribute to national unity. The mid-term strategic plan (RENSTRA 2005-2009) for the executing agency DGST regards port development in Eastern Indonesia and in border areas as a sector issue, and indicates policy direction towards the expansion of public investment into low-developed areas, remote areas, and border areas.

The project was consistent with Indonesia's national and sector policies during the period of both the project implementation and the project completion phases. The project has contributed to the improvement of living standards and regional development by supporting public investment in the small and medium ports located in inaccessible areas of Eastern Indonesia.

2.1.2 Consistency with Development Needs

All ports under the project were on Pioneer Routes and were non-commercial ports with inadequate facilities at the time of appraisal. At the time of ex-post evaluation, the ports improved by the project were still on Pioneer Routes. Several routes, one to five routes at each port, are serviced. As Pioneer Routes ensure freight and passenger services to satisfy local people in difficult to access areas, they contribute to the securing of the national minimum in the transport sector.¹ For this reason, the development need for the improvement of ports on Pioneer Routes is extremely high.

2.2 Efficiency (Rating : b)

Although the project cost was lower than planned, the project period was much longer than planned; therefore the evaluation for efficiency is moderate. The reason for the delay in the project implementation was prolonged procedures for the procurement of consulting services and civil works.

¹ National minimum is defined as the service level and living standards which a central government is obliged to provide or secure for citizens.

2.2.1 Project Outputs

As part of the project, the development of port facilities was carried out for small and medium ports on Pioneer Routes. There was no change in the target ports. The improvement of the port facilities followed the original plan (see Table 1, Figure 1).

The project monitoring and supervision consultant reexamined the procurement of cargo handling equipment. As a result of the reassessment, the number of forklift trucks² was reduced from twelve to three units. At the same time, two truck-cranes were added. As for the consulting service, the review of the detail design of ports, procurement assistance and construction management were conducted as planned.

Table 1: Content of the Civil Work (Planned & Actual)

Name of the Ports (Province)	Content of the Civil Work (Planned)	Content of the Civil Work (Actual)
Labuan Bajo (East Nusa Tenggara)	Wharf (1320 m ²), Port office, Parking area, Water supply system, Power generating facility, Harbor lamp	Wharf (1440 m ²), Port office, Passenger terminal, Warehouse, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Maritaing (East Nusa Tenggara)	Wharf (560 m ²), Port office, Water supply system, Power generating facility, Harbor lamp	Wharf (400 m ²), Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Menanga (East Nusa Tenggara)	Wharf (240 m ²), Port office, Warehouse, Cargo storage, Water supply system, Power generating facility, Harbor lamp	Wharf (400 m ²), Port office, Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Kasiui (Maluku)	Wharf (180 m ²), Port office, Water supply system, Power generating facility, Harbor lamp	Wharf (368 m ²), Port office, Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Kur Island (Maluku)	Wharf (180 m ²), Port office, Water supply system, Power generating facility, Harbor lamp	Wharf (560 m ²), Port office, Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Elat (Maluku)	Wharf (560 m ²), Port office, Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp	Wharf (560 m ²), Port office, Multipurpose building, Warehouse, Cargo storage, Water supply system, Power generating facility, Harbor lamp
Mega (West Papua)	Wharf (120 m ²), Port office, Water supply system, Power generating facility, Harbor lamp	Wharf (256 m ²), Port office, Multipurpose building, Water supply system, Power generating facility, Harbor lamp, Beacon
Pam Island (West Papua)	Wharf (560 m ²), Port office, Cargo storage, Water supply system	Wharf (560 m ²), Port office, Multipurpose building, Cargo storage, Water supply system, Power generating facility, Harbor lamp

² Powered industrial trucks used to lift and transport materials

Name of the Ports (Province)	Content of the Civil Work (Planned)	Content of the Civil Work (Actual)
Ansus (Papua)	Wharf (120 m ²), Port office, Water supply system, Power generating facility, Harbor lamp	Wharf (560 m ²), Port office, Multipurpose building, Water supply system, Power generating facility, Harbor lamp
Atsy (Papua)	Wharf (560 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp	Wharf (560 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp
Bayun (Papua)	Wharf (432 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp	Wharf (432 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp
Eci (Papua)	Wharf (432 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp	Wharf (432 m ²), Port office, Warehouse, Water supply system, Power generating facility, Harbor lamp

Source: DGST

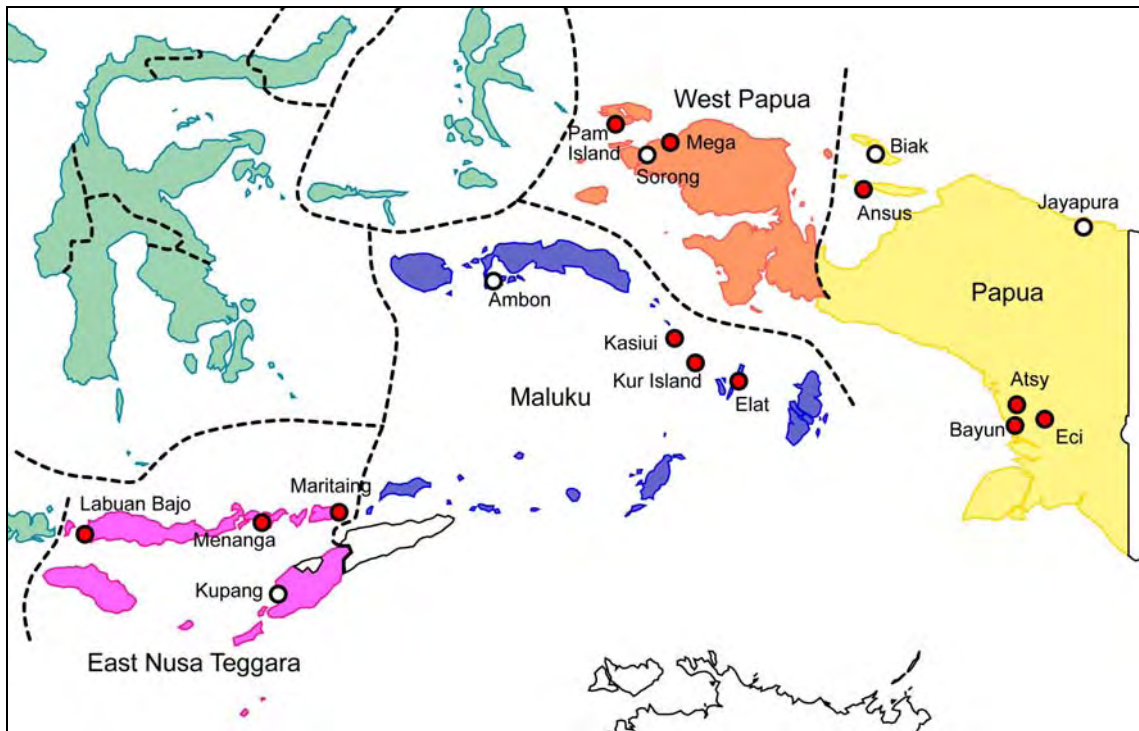


Figure 1: Location of the project target ports

2.2.2 Project Period

The project period exceeded the plan substantially. The actual schedule was 8 years and 5 months from January 1998 to May 2006 (210% of planned) while the planned schedule was 4 years from January 1998 to December 2001. The main reason for this delay was the prolonged procurement process for consultants³.

³ The project adopted a shortlist method. The executing agency narrowed down the candidate consulting

2.2.3 Project Cost

Although the project cost was estimated at 4,148 million yen (of which the Japanese ODA loan was 3,111 million yen) at the time of appraisal, the actual cost was 3,487 million yen (of which the Japanese ODA loan was 2,509 million yen) (84% of planned). As a result of competitive bidding, the project cost was below the plan.

2.3 Effectiveness (Rating: b)

As port management data is available for only two ports, it is difficult to evaluate the degree of attainment for the effectiveness targets. However, positive effects can be seen, such as the increases in ship calls, cargo handling volume and the number of passengers, as well as improvement in the convenience of the Pioneer Routes after the project completion.⁴ Therefore, this project has produced certain effects, and its effectiveness is moderate.

2.3.1 Number of Ships Entering the ports, Cargo Volume, and Passengers Embarking /Disembarking

(1) Labuan Bajo Port, Menanga Port

According to the operational data of two ports (Labuan Bajo port and Menanga port), cargo volume and the number of passengers increased as a result of the increase in ship calls at after project completion⁵ (see Table 2). The cargo volume at Labuan Bajo reached the target set at the time of appraisal while the number of passengers stayed below target. There is a ferry terminal managed by Bina Marga, Ministry of Transportation near Labuan Bajo port and arguably, passengers using short distance sea routes were dispersed over the two ports.

Table 2: Ship Calls, Cargo Volume, and the Number of Passengers
in Labuan Bajo Port and Menanga Port

Port	Indicators	2005 (Target)	2005 (Actual)	2006 (Actual)	2007 (Actual)	2008 (Actual)
Labuan Bajo Port	Ship Calls	—	886	1,195	1,302	1,602
	Cargo Volume (ton)	24,671	9,456	26,608	22,422	27,556
	Number of Passengers	94,410	17,695	25,489	29,440	36,044
Menanga Port	Ship Calls	—	395	788	806	792
	Cargo Volume (ton)	—	490	838	765	470
	Number of Passengers	—	15,853	32,593	20,035	8,152

Source: DGST

companies to a few in advance. It took a long time to make up the list of candidate companies.

⁴ As this project intends to secure a national minimum, the current operation of Pioneer Routes and local people's views on the benefits from ports were taken into consideration in the ex-post evaluation.

⁵ Civil works completed in March 2005 for Labuan Bajo port, and in October 2004 for Menanga Port.

(2) Number of Services, Cargo Volume and Number of Passengers Embarking/Disembarking on Pioneer Routes

The number of regular services on Pioneer Routes increased by approximately 70% during the period between 2003 (before project implementation) and 2007 (after project implementation) (see Table 3). Similarly, cargo volume and the number of passengers on Pioneer Routes increased significantly between 2003 and 2007 (see Table 4).⁶ The increase in cargo volume, which was only small before the project, was particularly striking. This signifies that the shipment of goods into other areas through the Pioneer Routes became more active. It can be concluded that the number of services on Pioneer Routes increased due to the development of the ports by the project and that the project resulted in more convenient and frequent services on the Pioneer Routes.

Table 3: Number of Sea Route Services on Pioneer Routes

Port	2003	2007
Labuan Bajo	2	2
Maritaing	1	1
Menanga	—	2
Kasiui	1	3
Kur Island	1	3
Elat	1	3
Mega	1	2
Pam Island	2	2
Ansus	2	5
Atsy	3	3
Bayun	3	3
Eci	2	3
Total	19	32

Source: DGST

Table 4: Cargo Volume and Number of Passengers on Pioneer Routes

Port	Cargo Volume (ton)				Number of Passengers			
	2003		2007		2003		2007	
	Loading	Unloading	Loading	Unloading	Embarkation	Disembarkation	Embarkation	Disembarkation
Labuan Bajo	0	65	171	241	90	108	808	757
Maritaing	0	135	-	-	0	135	-	-
Menanga	-	-	180	202	-	-	1,230	1,956
Kasiui	0	13	415	798	1,122	936	1,951	2,246
Kur Island	0	0	1,009	1,477	296	583	1,731	1,867
Elat	0	0	1,456	1,541	8	84	1,118	1,527
Mega	0	0	0	0	90	152	13	141
Pam Island	89	21	3	122	67	258	233	609
Ansus	0	0	292	282	0	0	1,151	2,698
Atsy	0	494	465	546	870	721	828	765
Bayun	113	833	559	577	1,642	1,164	1,268	859
Eci	0	32	203	115	353	174	159	808
Sub-Total	202	1,593	4,753	5,901	4,538	4,315	10,490	14,233
Total	1,795		10,654		8,853		24,753	

Source: DGST

⁶ In 2007, Pioneer Routes account for 2% of total cargo volume and 5% of total number of passengers in Labuan Bajo and 50% of total cargo volume and 16% of total number of passengers in Menanga.

2.3.2 Results of the Questionnaire Survey for Business Offices

From the questionnaire survey for business offices located near the project target ports, a more frequent use of ports and the improvement of passenger and freight services can be noted.

The amount of travel on vessels increased following the development of the ports, with the majority of the respondents traveling on vessels from the target ports at least once a month (see Figure 2). Over 90% of the respondents had the opinion that passenger and freight services were “improved” or had “improved a little”. The reasons for improvement were 1) safety, 2) shorter travel time, and 3) shorter waiting time, in order. The majority of respondents (66.4%) mentioned improvement of safety as the reason for improvement, and the contribution to safety by the project is highly valued (see Figure 3).

Picture 1 Questionnaire Survey for Residents



Beneficiary Survey conducted in this Ex-Post Evaluation

In the ex-post evaluation of “The Development of Small Ports in Eastern Indonesia”, a questionnaire survey and group interviews were carried out. The purpose of the beneficiary survey is to complement traffic and economic statistics and analyze project effect from the viewpoint of the users. The beneficiary survey conducted in this ex-post evaluation is as follows.

<Questionnaire survey for business offices located near the target ports>

Place : Elat port in Maluku, Labuan Bajo port in East Nusa Tenggara, Menanga port in East Nusa Tenggara

Time : March, April, June, 2009

Target : Business owners and employees from business offices located near the ports.

Number of samples: 118 persons (40 persons in Elat port, 40 persons in Labuan Bajo port, and 38 persons in Menanga port)

<Focus group discussion for residents near the target ports>

Place : Elat port in Maluku, Labuan Bajo port in East Nusa Tenggara

Time : March, April, 2009

Target : Residents living near the ports.

Number of samples: 40 persons
(26 persons in Elat port and 14 persons in Labuan Bajo port)

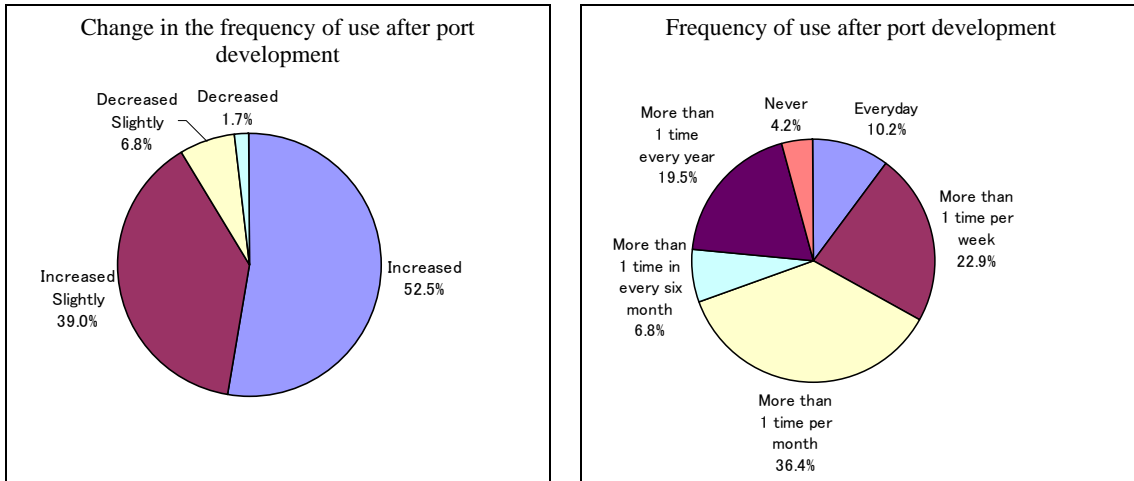


Figure 2: Frequency of Use of the Port After Port Development
(Questionnaire survey for business offices)⁷

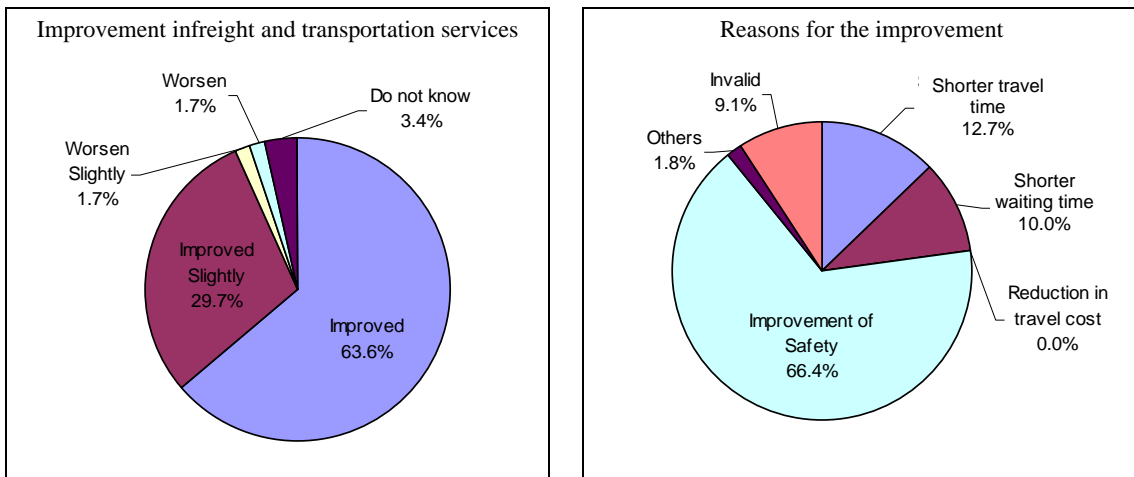


Figure 3: Improvement in the Passenger and Freight Services After Port Development
(Questionnaire survey for business offices)⁸

2.3.3 Improvement in Safety

As seen in “2.3.2 Results of the Questionnaire Survey for Business Offices”, in the questionnaire survey for residents, the improvement in safety was quoted as the major reason for the improvement in freight and passenger services after project completion. DGST staff and crew of vessels serving Pioneer Routes remarked in interviews that wharfs and harbor

⁷ Both “Change in the frequency of use after port development” and “Frequency of use after port development” depend on the results of questionnaire surveys for business owners and employees of business offices (118 persons) near the project target area.

⁸ “Improvement in freight and transport services” depends on the results of the questionnaire survey for business owners and employees of business offices (118 persons) near the project target area. 110 people who were asked about “Reasons for the improvement” answered “improved” or “improved a little” for the above question.

lamps contributed to safety. Before wharfs were improved through the project, accidents happened easily as large ships were not allowed to anchor, and the embarkation/disembarkation of passengers and the loading/unloading of cargo required transshipment to small boats. The improvement of wharfs has allowed large vessels to berth directly at the ports, enabling the embarkation/disembarkation of passengers and the loading/unloading of cargo. After the improvement works, jetties extended farther offshore. Harbor lamps indicating the location of a port at night, prevent collision with the jetty.

Photo 2 Harbor Lamp (Elat port)



Photo 3 Jetty (Labuan Bajo port)



2.4 Impact

2.4.1 Impact on Beneficiaries

The questionnaire survey for business offices near the project areas (Elat port in Maluku, Labuan Bajo port in East Nusa Tenggara, Menanga port in East Nusa Tenggara) shows the majority of respondents answering that the number of business opportunities and, furthermore, employment opportunities increased after port development. It can be concluded from this result that the project stimulated the local economy. (see Table 5, 6).

When focus group discussions for residents near the target areas were held in two ports (Elat port in Maluku and Labuan Bajo port in East Nusa Tenggara), a satisfaction survey also took place. More than half of the respondents answered “Completely Satisfied” or “Fairly Satisfied” at both of the ports, and it can be concluded that the satisfaction of local people is generally high (see Table 7). The result of the satisfaction vote was bipolarized in Elat while there was no such bias in Labuan Bajo. Participants in Elat remarked that 1) the deck part of the jetty is too high to moor small vessels and 2) only certain groups such as storekeepers can enjoy the benefits of the port. These complaints are presumably behind the strong feelings of dissatisfaction among the local people who do not benefit from Elat port. On the other hand, a wider group of people enjoys the benefits of Labuan Bajo port as tourism development progressed in tandem with the development of Labuan Bajo port. This widespread benefit has

resulted in a high level of satisfaction among the local people in Labuan Bajo.

Table 5: New Businesses Launched After Port Development
(Questionnaire survey for business offices)

Port	Increased	Not Changed	Decreased	Invalid
Elat port	26	13	1	0
Labuan Bajo port	31	9	0	0
Menanga port	35	2	0	1
Total	92	24	1	1
Ratio	78.0%	20.3%	0.8%	0.8%

Table 6: Employment Opportunities after Port Development
(Questionnaire survey for business offices)

Port	Increased	Not Changed	Decreased	Invalid
Elat port	19	19	2	0
Labuan Bajo port	29	11	0	0
Menanga port	34	3	0	1
Total	82	33	2	1
Ratio	69.5%	28.0%	1.7%	0.8%

Table 7: Satisfaction with Ports after Development (Focus Group Discussion)

Port	Completely Satisfied	Fairly Satisfied	Fairly Dissatisfied	Very Dissatisfied	Do not know
Elat port	10	4	3	8	1
	38.5%	15.4%	11.5%	30.8%	3.8%
Labuan Bajo port	8	6	0	0	0
	57.1%	42.9%	0.0%	0.0%	0.0%

2.4.2 Impacts on the Environment and Resident Relocation

Monitoring of the environmental impact was carried out routinely during the project. Water quality examination was held three times; before the commencement of civil work, during civil work, and after the completion of civil work. Water quality was mostly within the environmental standards⁹ (see Table 8). Water turbidity exceeded the environmental standards at the river ports where this situation had persisted before the commencement of civil work. Other factors other than the project arguably affected the results¹⁰. During the site survey of the ex-post evaluation (Elat port, Labuan Bajo port and Menanga port), no negative impact on the environment in and around the ports was observed.

There was no land acquisition nor relocation of local residents for any of the project

⁹ According to the environmental standards of the Government of Indonesia, BOD (biological oxygen demand) should be lower than 40mg/l, COD (chemical oxygen demand) should be lower than 80mg/l, ph (hydrogen-ion exponent) should be within 5-9, turbidity should be lower than 40NTU.

¹⁰ Turbidity before the civil work started was 553NTU for Aci port, 64NTU for Bayun port and 96.67NTU for Eci port and the data exceeded environmental standards at the time of the start of civil work.

target ports as the project aimed simply to improve existing port facilities.

Table 8: Water Quality of the Project Target Ports (After project completion)

Labuan Bajo	Maritaing	Menanga
BOD: 6.25 mg/l COD: 46.6 mg/l pH: 7.5 turbidity: 0.2 NTU	BOD: 8.04 mg/l COD: 19.35 mg/l pH: 7.9 turbidity: 3.5 NTU	BOD: 9.7 mg/l COD: 22.3 mg/l pH: 7.7 turbidity: 3.85 NTU
Kasiui	Kur Island	Elat
BOD: 5.4 mg/l COD: 29 mg/l pH: 7.5 turbidity: 7 NTU	BOD: 5.4 mg/l COD: 31 mg/l pH: 7 turbidity: 5.2 NTU	BOD: 4.5 mg/l COD: 24 mg/l pH: 3.1 turbidity: 8.5 NTU
Mega (Central)	Pam Island (Central)	Ansus (Central)
BOD: 7.39 mg/l COD: 19.54 mg/l pH: - turbidity: 0 NTU	BOD: 2.95 mg/l COD: 8.55 mg/l pH: - turbidity: 0 NTU	BOD: 25 mg/l COD: 63.55 mg/l pH: 8 turbidity: 1.50 NTU
Atsy	Bayun	Eci
BOD: 23.77 mg/l COD: 66.49 mg/l pH: 8.5 turbidity: 180.98 NTU	BOD: 33.97 mg/l COD: 82.34mg/l pH: 8.5 turbidity: 157.72 NTU	BOD: 17.72 mg/l COD: 57.94 mg/l pH: 8.5 turbidity: 117.14 NTU

Source: Project Completion Report “The Development of Small Ports in Eastern Indonesia”

2.5 Sustainability (Rating: b)

Though some problems have been observed in the O&M system and the financial status of DGST, the sustainability of this project is fair,

2.5.1 Executing Agency

2.5.1.1 Structural Aspects of Operation and Maintenance

KANPEL (Regional non-Commercial Port Offices) under DGST conduct the O&M of the ports developed by the project (see Table 9 regarding the KANPEL which are in charge of the project target ports). There are approximately 500 KANPEL across Indonesia, each KANPEL is in charge of more than one non-commercial port. KANPEL play various roles in port administration such as ship inspection, maritime safety, and the O&M of port facilities. In tandem with decentralization by the Government of Indonesia, a new sector policy was decided in 2002. O&M of non-commercial ports must be transferred from DGST to the local government if this is requested by a kabupaten government. After the port is transferred, the local government handles the O&M of the port, and DGST continues to handle ship inspection

and the safety of sea routes. By the time of the ex-post evaluation, the O&M of ports had not been transferred at any of the project target ports. However, the O&M of Pam Island port will be transferred as requested by the kabupaten government.

The collection and management of operation data for the project target ports (ships calls, cargo volume, number of passengers etc.) is not adequate. There is an issue in the monitoring of port administration. In addition, there is confusion in managerial responsibility in Elat where the kabupaten government took over port administration without a request for ownership transfer. In the case that substantial damage occurs, there is a risk that O&M might not be conducted appropriately because of the confusion in managerial responsibility.

Table 9: KANPEL handling O&M

Port	Province	KANPEL
Labuan Bajo	East	Labuan Bajo
Maritaing	Nusa	Baranusa
Menanga	Tenggara	Larantuka
Kasiui	Maluku	Geser
Kur Island		Tual
Elat		Tual
Mega	West Papua	Sorong
Pam Island		Saunek
Ansus	Papua	Serui
Atsy		Bade
Bayun		Bade
Eci		Agats

2.5.1.2 Technical Aspects of Operation and Maintenance

There are no civil engineers who station at the ports improved by the project. Each port or KANPEL is in charge of routine maintenance (inspection, lubrication, painting, etc.) which does not require advanced technology. If the port is damaged extensively by incidents such as natural disaster or accident, engineers at the DGST Jakarta head office assess the damage. Out of 27 engineers who work for DGST head office, 23 are civil engineers. The engineers in the DGST head office occasionally participate in both outside seminars and training courses.

2.5.1.3 Financial Aspects of Operation and Maintenance

O&M is handled within the budget allocated by DGST to each KANPEL. When repair or dredging is required, KANPEL sends a request to DGST head office for the work. The head office allocates the budget after examination. As user charges for ports are part of the general budget of the Government of Indonesia, they cannot be allocated directly to O&M. For 2008, DGST obtained 53.7 billion rupiah as the budget for port repair. This budget was not allocated to the project target ports because no serious problems preventing the normal operation of the ports occurred. For West Papua and Papua, the official handover from the Directorate of Port and Dredging, the section of DGST in charge of project implementation, to KANPEL was not completed. Although the ports are already in service, budget for repairs is not allocated to them until the official handover. The reason of the delay in the handover is the lack of budget. It is difficult however to secure budget for the dispatch of the five inspectors who are required to complete the handover process.

2.5.2 Current Status of Operation and Maintenance

No serious problems hindering the normal operation of ports was observed through the site survey of the ex-post evaluation in Elat port, Labuan Bajo port or Menanga port. However, minor problems (troubles with power generators, cargo handling equipment, wharfs, and harbor lamps) were found. Repairs needing additional budget allocation were not dealt with promptly.

3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

As the project aims to improve various facilities in the ports on Pioneer Routes serving areas which are difficult to access, the consistency with development needs is high. At the project target ports, the service of Pioneer Routes improved due to an increase in the number of services. The satisfaction level of local residents is high. However, the collection of port operation data is not adequate. This is a persistent issue in the monitoring of port administration. Although minor damages were found in the improved infrastructures, no serious problems hindering the function of ports were observed. In light of the above, this project is evaluated to be fairly satisfactory.

3.2 Lessons Learned

(1) Achievement of the National Minimum

This project developed port facilities in areas inaccessible by land transport, improved the convenience of Pioneer Routes, and aimed to ensure the national minimum in the transport sector. Unlike for large commercial ports, the project object for small ports is not only economic efficiency but also the stable provision of transport to local people. With these points in mind, it is recommended that the target level of the national minimum is set and the means to achieve the target at the formation of projects targeting small ports clarified.

3.3 Recommendations

(1) To Establish a Port Administration Monitoring System (for the executing agency)

Because the monitoring system for port operation is not established, basic data for port administration has not been collected. Therefore, neither budget allocation nor personnel positioning was based on actual operational conditions. It seems that the “Check” function of the PDCA cycle¹¹ is insufficient. It is recommended that the executing agency collect and manage basic port operation data, feeding back the data to port operation.

¹¹Initials of four steps of the project; Plan – Do – Check – Act. The project is improved continuously by continuous management of the PDCA cycle.

(2) Responsibility for Maintenance (for the executing agency)

In Elat, the local kabupaten government participates in port administration. In the provinces of Papua and West Papua, transfer from the DGST headquarters to KANPEL has not been completed. In both areas, the responsibility for maintenance is unclear. It is recommended that the responsibility for maintenance is defined by establishing a common understanding among stakeholders and by empowering the government offices in charge of maintenance. For the six ports in the provinces of Papua and West Papua, it is desirable that both the budget for inspectors and their prompt dispatch is secured, that the transfer to KANPEL is completed, and the responsibility for maintenance defined.

Comparison of Original and Actual Scope

Item	Original	Actual
<p>1. Project Outputs</p> <p>a) Civil works</p> <p>b) Handling equipment</p> <p>c) Consulting service</p>	<p>Construction of wharfs, mooring facilities, harbor lamps, incidental equipment (port offices etc.) at 12 ports.</p> <p>1) Laban Bacjo 2) Menanga 3) Maritaing 4) Kur Island 5) Elat 6) Kasiui 7) Mega 8) Pam Island 9) Ansus 10) Atsy 11) Bayun 12) Echi</p> <p>Forklift 12 units</p> <p>Content of consulting service is as follows. 1) Review of detail design 2) Procurement assistance 3) Execution management</p>	<p>Same as planned</p> <p>No change for the target port</p> <p>Forklift 3 units Truck with crane 2 units</p> <p>Same as planned</p>
<p>2) Project Period</p> <p>Consultant selection</p> <p>Consulting service</p> <p>Bid for civil works</p> <p>Civil works</p>	<p>January 1998 – June 1998</p> <p>July 1998 – December 2001</p> <p>July 1997 – June 2000</p> <p>December 1999 – December 2001</p> <p>(Total: 4 years)</p>	<p>January 1998 – February 2001</p> <p>March 2001 – May 2006</p> <p>September 2001 – September 2003</p> <p>October 2003 – May 2006</p> <p>(Total: 8 years and 5 months)</p>
<p>3) Project Cost</p> <p>Total</p> <p>Japanese ODA loan portion</p> <p>Exchange rate</p>	<p>4,148 million yen</p> <p>3,111 million yen</p> <p>1 Rp= 0.052 yen (as of 1998)</p>	<p>3,487 million yen</p> <p>2,509 million yen</p> <p>1 Rp= 0.013 yen (average during the project implementation)</p>

Indonesia

Ex-post Evaluation of Japanese ODA Loan Project
“Disaster Prevention Ships Procurement Project”

External Evaluator: Nobuyuki Kobayashi
(OPMAC Corporation)
Field Survey: June 2009

1. Outline of the ODA Loan Assistance



Map of the Project Area



Procured Marine Disaster Prevention Ship
(KN. Alugara)

1.1 Background

Indonesia is an archipelagic nation of over 17,000 scattered islands and its jurisdiction (total of territory and exclusive economic zone) is the world’s third largest¹. Transport between its islands, especially freight transport, depends highly on maritime transport. Patrols at sea and the reaction to marine accidents by marine disaster prevention ships (MDPS) are extremely important for maritime safety.

Furthermore, very important sea routes such as the Malacca-Singapore Straits and the Lombok Straits pass close to Indonesia. The Malacca-Singapore Straits, in particular, is part of the sea route for oil tankers between the Middle East and Japan and is thus an extremely important sea route in terms of international shipping to Japan. Many large tankers navigate in these areas. An oil spill accident would cause not only economic loss but also serious impact on the natural environment.

At the time of the project appraisal (1995), the Government of Indonesia had no ships specializing in dealing with oil spill accidents and tanker fires. The establishment of a system to cope with tanker accidents was an urgent matter.

¹ Based on the Ship and Ocean Foundation “The First Issue of Maritime White Paper 2004”

1.2 Objective

The objective of this project is to prevent marine accidents and to minimize damage caused by marine accidents through the enhancement of patrols in all sea areas of Indonesia by the procurement of two 500 total gross tonnage Marine Disaster Prevention Ships, thereby contributing to the promotion of maritime safety.

1.3 Borrower / Executing Agency

Government of Indonesia / Directorate General of Sea Communication, Ministry of Transportation (DGST)

1.4 Outline of the Loan Agreement

Approved Amount / Disbursed Amount	5,501 million yen / 2,789 million yen
End Notes Exchange Date / Loan Agreement Signing Date	December 1, 1995 / December 1, 1995
Terms and Conditions	Interest Rate: 2.3% (Consultant Portion 2.3%) Repayment Period: 30 years (Grace Period: 10 years) Procurement :General Untied
Final Disbursement Date	June 30, 2006
Main Contractor (Over 1 billion yen)	Tomen Corporation (Japan)
Main Consultant (Over 100 million yen)	Shipbuilding Research Centre of Japan (Japan) • PT TOMO & SON (Indonesia) (JV)
Feasibility Studies, etc. (F/S)	1988 “The Study on Maritime Safety Plan Concerning Search and Rescue” (JICA)
Related Projects	None

2. Evaluation Results (Rating: C)

2.1 Relevance (Rating: a)

This project has been highly relevant with Indonesia’s national policies and development needs at the times of both appraisal and ex-post evaluation.

2.1.1 Consistency with Indonesia’s Development Policy

At the time of appraisal, the Sixth Five Year National Development Plan (REPELITA VI, 1994 – 1998) included the development of ports as bases to promote economic activity and the development of international hub ports. The plan also attached importance to the enhancement of maritime transport services.

In the Study on Maritime Safety Plan Concerning Search and Rescue (1988), a plan which prepared by JICA, it was suggested that eleven long-range MDPS would be needed for the safety of all sea areas in Indonesia. At that time, KPLP (Directorate of Sea and Coast Guard) possessed small MDPS such as 100 total gross tonnage ships that were not able to cover the sea area adequately. For this reason, the procurement of large MDPS was an urgent task.

At the time of ex-post evaluation, the Medium-Term National Development Plan (PRJM 2004–2009) addressed crime prevention at sea and recommended strict law enforcement against illegal activities, enhancing maritime monitoring by relevant agencies and local communities, and developing systems to tighten controls.

The department mid-term strategic plan (RENSTRA 2005-2009) prepared by the executing agency, DGST, planned to procure six Class I MDPS (over 60m) for the reinforcement of marine safety. In addition to this project, two Class I MDPS were procured with support from the Dutch government².

The project is consistent with Indonesia's national and sector policy because the project aims at the improvement of maritime safety by the procurement of large MDPS.

2.1.2 Consistency with Development Needs

At the beginning of the 1990s, oil spill accidents occurred frequently in the Malacca-Singapore Straits. At the time of the accident of the Mearsk Navigator January 1993, the tanker, which was on fire, drifted into the Indian Sea. At the time of appraisal, the Government of Indonesia did not possess vessels with firefighting equipment and a sufficient range to take prompt and appropriate action in the case of tanker accidents.

As oil spill accidents occurred frequently, ASEAN countries signed the memorandum ASEAN-OSPAR MOU in 1993 and a cooperative relationship in the region for oil spill accidents was established. At the time of the ex-post evaluation, ASEAN countries maintained a cooperative relationship for oil spill accidents. The countries hold regular meetings concerning actions to deal with oil spill

Photo 1 Deck gun of MDPS (KN. Alugara)



²The MDPS procured with the support of the Netherlands were deployed to the bases at Tanjung Priok (DKI Jakarta) and Tanjung Uban (Riau Islands) respectively. The activity area of both ships is the total Indonesian sea area, as such class I MDPS with a long range are dispatched for emergencies.

accidents with information sharing on regional cooperation, oil spill accidents, and accident countermeasures. In addition, chemical spill accidents were also included in this framework after 2002. MDPS procured by the project have equipment for vessel fires and oil spill accidents. The need to cope with tanker accidents was also taken into consideration.

The Government of Indonesia did not have enough large MDPS either at the time of appraisal or at the time of ex-post evaluation. As mentioned above, the Study on the Maritime Safety Plan Concerning Search and Rescue suggested that eleven Class I MDPS, ships which would have long patrol ranges for search and rescue activities in the entire Indonesian sea area, would be needed. At least five class I MDPS are still needed even if their activity is limited to major sea routes (see Figure 1)³. At the time of ex-post evaluation, as one of MDPS procured by the project had sunk⁴, DGST had only three Class I MDPS, ships procured by this project and supported by the Netherlands. The need for large MDPS is still not satisfied, even today.

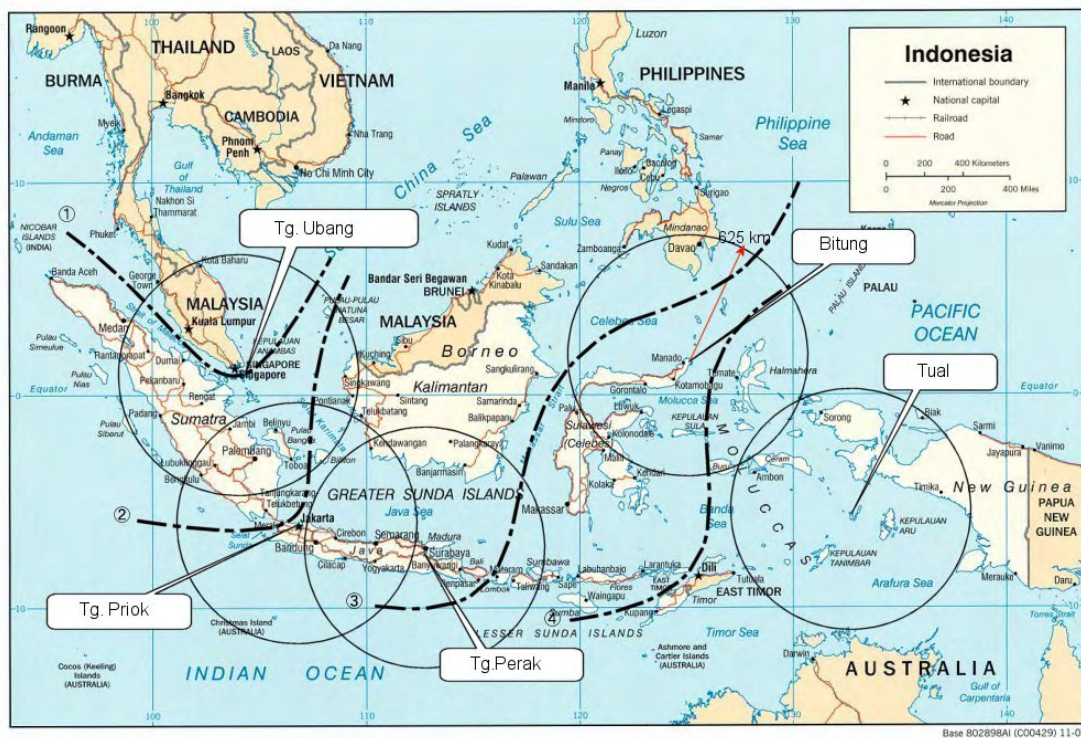


Figure 1: MDPS Cruising Range

³ For Figure 1, dashed lines are the main sea routes, and circles are the cruising range of MDPS. The cruising range of MDPS is based on the Class I MDPS procured by the project, and the range is 3000 nautical miles or seven days operation in a row. One MDPS is supposed to be deployed at five bases of KPLP.

⁴ KN. Arda Dedali, one of the two ships procured by the project, sank in May 2006. (for details see “2.3.4 Sinking of KN. Arda Dedali”)

2.2 Efficiency (Rating: b)

Although the project cost was lower than planned, the project period was much longer than planned; therefore, the evaluation for efficiency is moderate.

2.2.1 Project Outputs

Both the ships procured under the main contract of the project and the consulting services are as shown in Table 1. Outputs are in accordance with the original plan. The respective MDPS were built both in Japan and Indonesia. No.1 ship KN. Arda Dedali was built in the Niigata factory of Niigata Shipbuilding, and No.2 ship KN. Alugara was built in the Surabaya shipbuilding yard of PT. PAL (Indonesia).

At the time of the shipbuilding in Indonesia, Japanese contractors gave technical advice and supplied materials to the Indonesian shipbuilder. Training for ship maneuvers was implemented under the main contract while training for disaster-prevention equipment was implemented as part of the consulting service. Training for the disaster-prevention equipment was implemented both in Japan and Indonesia and the training course conformed to the model course designed by IMO⁵.

Table 1: Output of the Project

Main Contract	
MDPS of 500 total gross tonnages:	2 units
Gross Tonnage :	Approximately 530 tonnages
Length :	60.0m
Breadth :	8.0m
Depth :	4.5m
Main Engine :	2,200 PS (1,100PS X 2)
Firefighting Equipment :	Oil boom, Skimmer, Recovered oil strage tank, Spilled oil dispersant sparging apparatus, Fire pump, etc.
Consulting Service	
International :	64.5M/M
Local :	103.5M/M
Content :	Reviewing of ship design, Assistance in bidding, Supervision of construction, Training for disaster-prevention equipment

2.2.2 Project Period

The project period substantially exceeded the plan. The actual period was 10 years and 7 months from December 1995 to June 2006 (190% of planned) while the planned period was 5 years and 7 months from December 1995 to June 2001. The main reason of this delay was

⁵ International Maritime Organization

the delay in the main contract. The resignation of President Suharto caused turmoil in the bureaucracy and delayed the detail design of the main contract, the preparation of tender documents, and the prequalification of bidders. In addition, retender was carried out for the procurement of ships, which added more time until the signing of the main contract. As a company having a subsidy from its home country bided for the first tender, the resulting violation of fairness among bidders resulted in retender. After the contract was signed, the project pursued smoothly with the first ship KN. Arda Dedali being delivered in December 2004 and the second ship KN. Alugara in June 2005.

2.2.3 Project Cost

Although the project cost was estimated at 6,115 million yen (of which the Japanese ODA loan was 5,501 million yen) at the time of planning, the actual cost was 3,557 million yen (of which the Japanese ODA loan was 3,221 million yen) (58% of planned). The project output was not different from the plan. Meanwhile, the project cost was below 60% of the plan. Competitive bidding resulted in a decrease in project cost.

2.3 Effectiveness (Rating: b)

The level of the annual navigation days is extremely high, though only one of two MDPS procured by the project was in operation at the time of ex-post evaluation. As the number of large MDPS is limited, patrol areas are expanded from the Malacca-Singapore Straits to all sea areas in Indonesia. Therefore, this project has produced certain effects, and its effectiveness is moderate.

2.3.1 Operational Status of MDPS

At the time of ex-post evaluation, only KN. Alugara is in operation. It was assumed that two MDPS would be in operation alternately with one of the two MDPS in navigation at all times in the patrol area. In 2008, the Annual Navigation Days decreased to 50% of the plan. This was due to a steep rise in oil prices and to engine trouble. In 2009, after engine repairs, the level of Annual Navigation Days for KN. Alugara is recovering. As a dry docking is not planned at least until the end of 2009, the level of Annual Navigation Days is expected to recover to the level that it was in 2007.

In addition to patrolling missions, KN. Alugara is constantly on search and rescue (SAR) mission and copes with oil spill accidents. It therefore pursues the missions expected at the time of appraisal (see Table 3).

At the time of appraisal, it was expected that both of the two MDPS would be deployed at the Tanjung Priok base (DKI Jakarta), and that they would patrol the Malacca-Singapore Straits. At the time of ex-post evaluation, KN. Alugara was deployed at the Tanjung Priok

base and its patrol area is the entire sea area of Indonesia. KN. Alugara can be utilized for emergency dispatches as most of the DGST MDPS have a short cruising range.

Table 2: Annual Navigation days of KN. Alugara

	Target at the time of appraisal*	2007	2008	2009**
Annual Navigation days	365	334	188	172

Source: DGST

Note 1): * total days for two ships

Note 2): ** as of June 21, 2009

Table 3: Number of SAR Missions, Passengers Rescued and Oil Spills Missions

	2006	2007	2008
Number of SAR Missions	1	3	2
Number of Passengers Rescued	6	-	50
Number of Oil Spills Missions	1	3	3

Source: DGST

2.3.2 Results of the Questionnaire Survey for Beneficiaries

As part of the ex-post evaluation, questionnaire surveys were conducted in April and June 2009. The samples were 127 persons belonging to private companies (shipping companies), Government / State-owned companies (DGST, KPLP, state-owned shipping companies, etc.)⁶, and organizations thought to be beneficiaries. (see Figure 2 for the structure of respondents)

Since KN. Alugara is just one vessel out of approximately 160 ships under KPLP, its public recognition is not high (see Table 4). However, respondents who know the ship highly value its actual activities (see Table 5). The contribution of the activities of MDPS is recognized in general. In particular, the contribution of SAR missions is most highly valued. As KN. Alugara is utilized for emergency dispatches to maritime accidents because of its long cruising range, many opinions were expressed that highly value this prompt action.

Table 4: Publicity of KN. Alugara

Know	Not Know	Total
29 (22.8%)	98 (77.2%)	127 (100.0%)

⁶ Taking into consideration the objectivity of survey results, crew and former crew of KN. Alugara among DGST staff were excluded from the respondents.

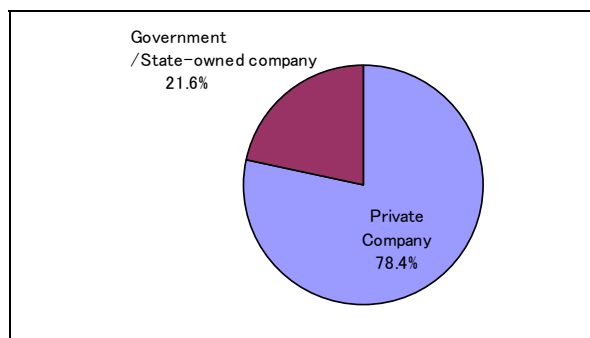


Figure 2: Profile of Respondents

Table 5: Contribution of KN. Alugara to Maritime Safety

	Yes, very much	Yes, to some extent	No, not so much	No, not at all	N/A	Total
Maritime Safety	21 (72.4%)	6 (20.7%)	0 (0.0%)	0 (0.0%)	2 (6.9%)	29 (100.0%)
Vessel Fires	20 (69.0%)	7 (24.1%)	0 (0.0%)	0 (0.0%)	2 (6.9%)	29 (100.0%)
Oil Spills Accidents	23 (79.3%)	2 (6.9%)	2 (6.9%)	0 (0.0%)	2 (6.9%)	29 (100.0%)
Prevention of Piracy	18 (62.1%)	8 (27.6%)	1 (3.5%)	0 (0.0%)	2 (6.9%)	29 (100.0%)
SAR Missions	23 (79.3%)	4 (13.8%)	0 (0.0%)	0 (0.0%)	2 (6.9%)	29 (100.0%)

2.3.3 Example of SAR Missions

Out of the activities of KN. Alugara, SAR operations are the most highly valued, as pointed out in “2.3.2 Results of the Questionnaire Survey for Beneficiaries”

In January 2009, the MV Teratai Prima sank in the Makassar Straits and KN. Alugara was engaged in a SAR mission for 10 days. The Teratai Prima had had 270 people including crew and passengers on board and about 30 people were rescued. At the time of the accident, waves of 4 m and strong winds of 20 knots had hit the area. As it was dangerous for small vessels to pursue a SAR mission, the large MDPS KN. Alugara was put into operation.

Photo 2 Crew Searching for Victims



Photo credit: DGST

As the time from accident to rescue substantially affects the survival rate of victims, this rescue operation immediately after the accident was very meaningful from the viewpoint of minimizing the number of casualties.

2.3.4 Sinking of KN. Arda Dedali

KN. Arda Dedali, one of the MDPS procured by the project, was stranded and sank at Sape Bay, West Nusa Tenggara on May 11, 2006. This accident was due to bad weather and human error on the part of the captain and his staff. At the time of sinking, 20 crew were on board⁷. In accordance with the decision of the maritime court, captain and a crew of KN. Arda Dedali were condemned to a temporary deprivation of their crew certificates.

2.4 Impact

2.4.1 Containment of Maritime Accidents

From 1997 (before project implementation) to 2007 (after project completion), the number of maritime accidents in Indonesian had increased by 50% and the number of deaths or of persons missing had increased by 20%. Meanwhile, the number of shipping companies and that of ships had increased by 80%, and the gross tonnage by 20% (see Table 6). Regardless of the expansion in maritime transportation, the number of maritime accidents and that of deaths / persons missing in Indonesian had been contained. The activities of KN. Alugara in the Indonesian sea area had presumably contributed to this.

Table 6: Number of Maritime Accidents, Sea Transport Companies and Ships

	1997	2006	2007
Number of Maritime Accidents	106	115	159
Deaths / Missing persons	190	223	221
Number of Shipping Companies	747	1,380	—
Number of Ships	2,383	4,271	—
Gross Tonnage	3,195	5,287	—

Source: Lloyd's, DGST, Ministry of Communication

2.4.2 Impacts on the environment

MDPS is utilized to cope with accidents which may lead to oil or chemical spills such as tanker fires, thus contributing to the protection of the natural environment.

⁷ The regulations regarding the number of MDPS crew were revised in January 2008. The number of crew for class I-B, into which KN. Alugara and KN. Arda Dedali are classified, is 34. Regarding the present number of crew, the number was presumably insufficient at the time of the accident.

At the end of January 2008, a tanker caught fire at the special port for the Balongan refinery of PT Pertamina, Indonesia's state oil company. KN. Alugara extinguished the fire. As the company's tanker, MT. Pendopo, was transporting 12,500 barrels of naphtha oil, there was the possibility of environmental pollution through naphtha oil spills. KN. Alugara worked on the accident around the port for eleven days. Water occasionally causes explosions when it is used to extinguish fires on oil products. Fire fighting with chemical foam was therefore carried out. After the tanker fire was extinguished, the local government and NGO inspected the surrounding seacoast in detail and confirmed that there was no pollution through oil spills.

Photo 3 Tanker on Fire



Photo 4 Firefighting by KN. Alugara



Photo Credit: DGST

2.5 Sustainability (Rating: b)

Though some problems have been observed in terms of the system of operation and maintenance in DGST, the sustainability of this project is fair. The operation and maintenance (O&M) of KN. Alugara has the problem that the number of crew does not reach the complement and that the annual O&M does not necessarily follow the maintenance manuals.

2.5.1 Executing Agency

2.5.1.1 Structural Aspects of Operation and Maintenance

KPLP (Directorate of Sea & Coast Guard) under DGST is in charge of the O&M of MDPS procured by the project. KPLP is also responsible for SAR operation, maritime safety, and law enforcement. KPLP has five bases across Indonesia (Tanjung Priok, Tanjung Perak, Tanjung Uban, Bitung, and Tual), and the Tanjung Priok base supervises the other bases.⁸ As

⁸ The Head of the Base of Sea and Coast Guard is directly responsible to the Director General of Sea Transportation for the activities at the bases.

the functional responsibilities of KPLP overlap with the marine police, the custom office, marine rescue units and the navy, the Government of Indonesia plans to divide KPLP from DGST after clarifying roles. KPLP will be under the direct command of the President by 2011.

Following the sinking of KN. Arda Dedali, DGST established the number and licenses of crew needed for the operation of Class I MDPS in January 2008. Before this, there had been no definite regulations for the number and certificates of crew for Class I MDPS. The complement of crew is 34 but the actual number of crew on KN. Alugara at present is 28 (of which 4 are trainees). Although navigation officers and the engineers reach complement, the number of seafarers does not. There are problems for crew such as inadequate rest due to insufficient numbers at the time of maritime accidents.

2.5.1.2 Technical Aspects of Operation and Maintenance

In addition to daily inspections, routine maintenance (lubrication, replacement of running parts), annual maintenance (dry dock), and emergency maintenance (repair of broken parts) is conducted. Maintenance manuals are prepared for each type of O&M. As KN. Alugara was constructed in Indonesia and the shipyard knows the ship design well, it is relatively easy to carry out emergency maintenance.

Training for disaster-prevention equipment was implemented in both Japan and Indonesia at the time of the procurement of the ships. Operational procedures vary for disaster-prevention equipment. Furthermore, few participants could take part in training in Japan. For this reason, instructors were dispatched to Indonesia for the wider participation of trainees. Had the training been implemented only in Japan, trainees would not have shared the details of training with other crew and knowledge would not be institutionalized in the organization. Training in Indonesia dealt with this issue. However, training for disaster-prevention equipment was not implemented in 2007 or 2008. Because of the frequent changes in ship crews for the MDPS, continual training is desirable. In consideration of the above, the frequency of training after project completion has not been sufficient. It is difficult to implement training for disaster-prevention equipment. KN. Alugara patrols outside Tanjung Priok port while the disaster-prevention equipment is placed at Tanjung Priok port.

2.5.1.3 Financial Aspects of Operation and Maintenance

An O&M budget of 3 billion rupiah (nearly equivalent to 29 million yen) is allocated, and fuel costs account for approximately 80% of this (see Table 7). The budget allocated is only one-quarter of the requested amount. The last annual O&M of KN. Alugara was conducted in May 2007 but annual O&M has not been conducted since then. The maintenance manual

stipulates dry dock maintenance once a year but this type of maintenance has not been conducted since 2007. Although there are no regulations for dry dock maintenance for government-owned ships, DGST has the policy of conducting dry dock maintenance every two years (six months extendible), following the international agreement of commercial vessels. The next dry dock maintenance is expected to be in 2010.

Table 7: Budget Allocation for the O&M of KN. Alugara

(Unit: thousand rupiah)

Items	2007	2008	2009
Fuel charges	2,914,266	2,718,475	2,553,586
Fresh water	54,750	54,750	54,750
Spare parts	115,371	145,787	147,055
Repairs	142,128	345,878	345,987
Total	3,226,515	3,264,890	3,101,378

Source: DGST

2.5.2 Current Status of Operation and Maintenance

In the field survey of KN. Alugara, no serious problems hindering ship operation were not observed. However, some minor troubles such as in searchlights, winches, and a rescue boat were found. Some spare parts (searchlight lamps, an engine for rescue boat, etc.) are not available in Indonesia. These parts need to be purchased in Singapore and, thus it takes time to deal with machine troubles.

Photo 5 Searchlight of KN. Alugara



3. Conclusion, Lessons Learned and Recommendations

3.1 Conclusion

The improvement of maritime safety is an important issue for Indonesia, a country which owns vast territorial waters. The project has been highly relevant to Indonesia's national policies and development needs. The efficiency of project implementation is judged to be low as it took time to finalize the contract for the procurement of the ships. One MDPS is in operation at the time of ex-post evaluation. The need for such large MDPS is strong and

annual navigation days remain at a high level. Positive impacts such as the containment of maritime accidents and the impact on the natural environment were found. No serious problems hindering ship operation were observed. Nevertheless, annual O&M is postponed. In light of the above, this project is evaluated to be fairly satisfactory.

3.2 Lessons Learned

(1) Implementation of training in the country of execution

Training for disaster-prevention equipment was implemented in Indonesia, in addition to Japan, with instructors dispatched, and many trainees attended. For the project to be affective, it is desirable to include training on crucial procedures for the operation of procured equipment in the recipient country so that many trainees could participate in the training.

3.3 Recommendations

(1) Securing crew for KN. Alugara (for the executing agency)

Before the sinking of KN. Arda Dedali, the number and licenses of crew for Class I MDPS was not established. A relatively small crew (20 persons) was operating the ship at the time of sinking. After the accident, the number and licenses of crew were regulated. However, the number of crew on board is still insufficient. For the safe operation of MDPS, KN. Alugara has to secure the necessary number of crew as early as possible.

(2) Continual training for disaster-prevention equipment (for the executing agency)

In order to cope with the frequent changes in ship crews of MPDS, continual training for disaster-prevention equipment is desirable. This type of training, however, was not conducted for 2007 and 2008. It is recommended to deliberately support practitioners and develop human resources by continual training with the disaster-prevention equipment..

(3) Periodic maintenance of ships (for the executing agency)

Although the last annual O&M of KN. Alugara was conducted in May 2007, dry-docking, which is stipulated in the maintenance manual, has not been conducted since then. Periodic maintenance with sufficient allocation of budget is recommended unless dry-docking is possible. This measure should aim at the prevention of a shorter ship life due to an increase in sailing days.

Comparison of Original and Actual Scope

Item	Original	Actual
1. Project Outputs	500 GMT MDPS - 2 units	Same as planned
(a) Procurement of ships	Total Gross Tonnage: approximately 530 tonnage Length: 60.0m Breadth: 8.0m Depth: 4.5m Main engine: 2200PS (1100PS X 2) Disaster-prevention equipment: Oil boom, Skimmer, Recovered oil strage tank, Spilled oil dispersant sparging apparatus, Fire pump, etc.	
(b) Consulting service	Content of consulting service is as follows. 1) Review of detail design 2) Procurement assistance 3) Execution management 4) Training for disaster prevention equipment	Same as planned
2. Project Period		
Consultant selection	December 1995 – September 1996	December 1995 – July 1997
Consulting service	October 1996 – June 2001	July 1997 – June 2006
Bid	March 1997 – June 1998	September 1998 – February 2004
Shipbuilding	June 1998 – June 2000	March 2004 – July 2005
Guarantee Period	July 2000 – June 2001	December 2004 – June 2006
3. Project cost		
Foreign currency	5,501 million yen	3,498 million yen
Local currency	614 million yen (13,645 million rupiah)	59million yen (4,496 million rupiah)
Total	6,115 million yen	3,557 million yen
Japanese ODA loan portion	5,501 million yen	3,221 million yen
Exchange rate	1 Rp= 0.045 yen (as of 1995)	1 Rp= 0.013 yen (Exchange rate used in Project Completion Report)