

Indonesia

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

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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 1995<sup>1</sup>, 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



<sup>1</sup> 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

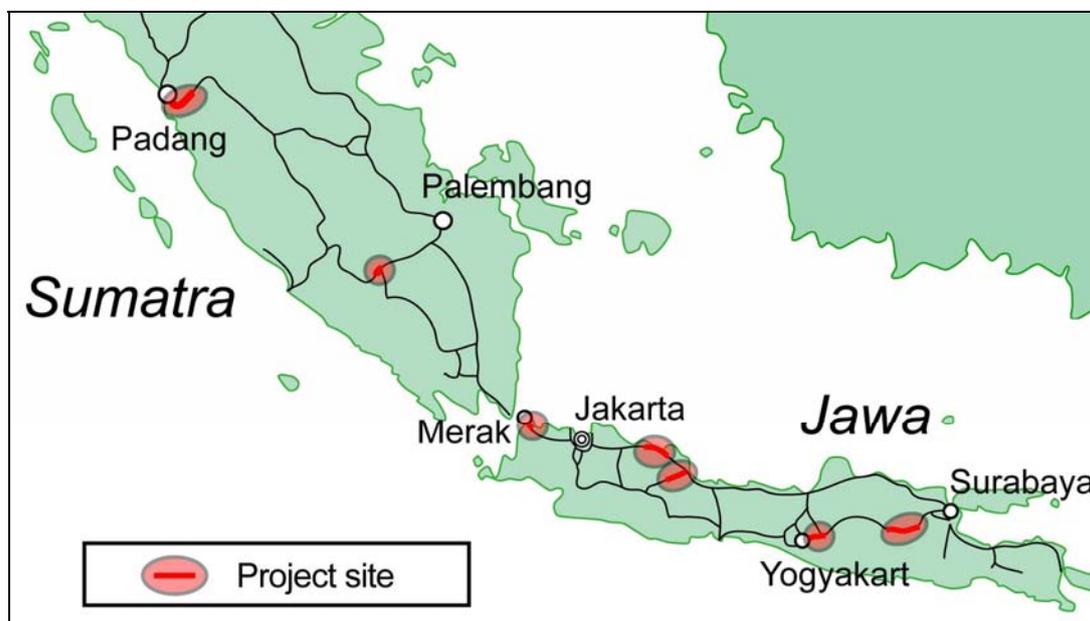


Figure 1: Map of the Target Sections

### 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 Sumatra<sup>2</sup>. 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 completion<sup>3</sup>, 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.

<sup>2</sup> 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.

<sup>3</sup> 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%

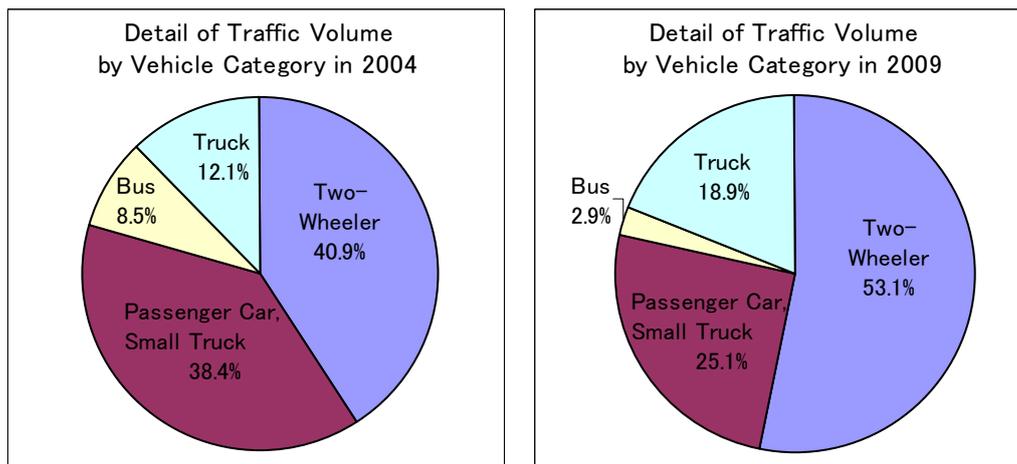


Figure 2: Change of the Vehicle Category Before/After the Project

### 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 2007<sup>4</sup> 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.

<sup>4</sup> 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 Province<sup>5</sup>

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

<sup>5</sup>To 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.<sup>6</sup> 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

<sup>6</sup> 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.

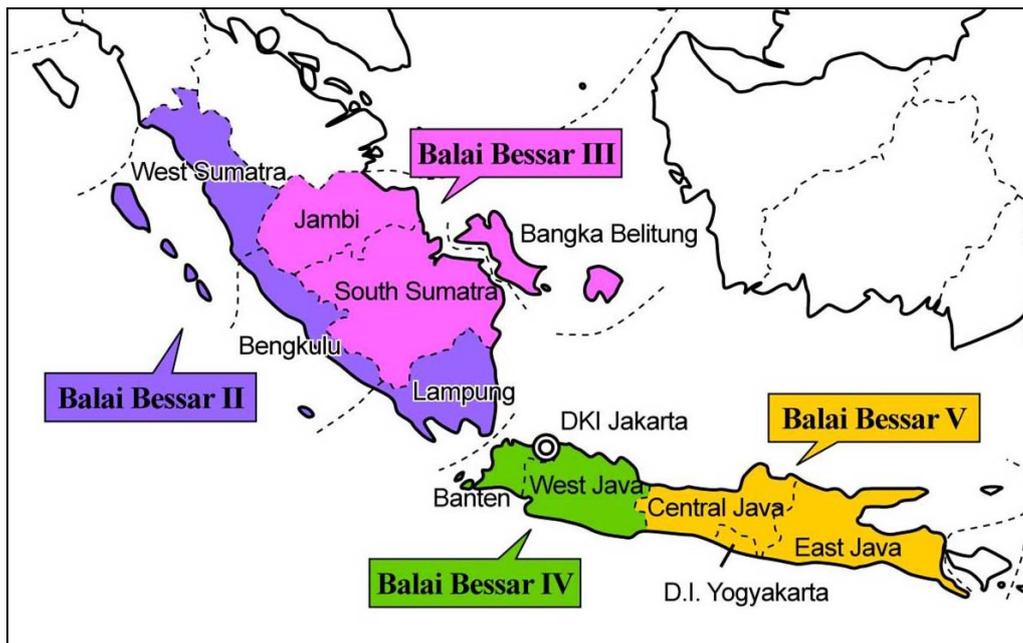


Figure 3: Administration Area of Each Balai

Table 14: Administration Section of Each Balai

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

### 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 IRI<sup>7</sup> 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”.

<sup>7</sup> 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 cycle<sup>8</sup>. It is preferable to set the indicators at the time of appraisal and collect data before and after project completion.

### 3.3 Recommendations

None

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<sup>8</sup> 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"> <li>1) Merak – Cilegon</li> <li>2) Prambanan – Kartosuro</li> <li>3) Kartosuro – Palur</li> <li>4) Yogyakarta – Prambanan</li> <li>5) Nganjuk – Gemekan</li> <li>6) Muara Enim – Lahat</li> <li>7) Lubuk Selasih – Muara Klaban</li> </ol> <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"> <li>1) Merak – Cilegon, Jasa Mrga Access Road</li> <li>2) Prambanan – Klaten, Klaten Bypass, Klaten – Kartosuro</li> <li>3) Outside of the project</li> <li>4) Janty Floyover, Yogyakarta – Prambanan</li> <li>5) Nganjuk – Jombang, Jombang –Gemekan, Jombang – Mojokerto</li> <li>6) Muara Enim – Merapi</li> <li>7) Lubuk Selasih – Solok, Solok –Muara Kelaban</li> <li>8) Lohbener – Jatibarang , Pamanukan- Eretan Kulon</li> </ol> <p>Total : 231.1km</p>
b) Consulting service	<p>Content of consulting service as follows.</p> <ol style="list-style-type: none"> <li>1) Review of detail design</li> <li>2) Procurement assistance</li> <li>3) Execution management</li> </ol>	<p>Content of consulting service as follows.</p> <ol style="list-style-type: none"> <li>1) Review of detail design</li> <li>2) Procurement assistance</li> <li>3) Execution management</li> <li>4) Survey of landform and geology</li> </ol>
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)