

Republic of Philippines
Arterial Road Links Development Project, Phase III

External Evaluators : Yauhiro Kawabata, Hiroshi Aoki, Sanshu Engineering Consultant

Field Survey : November 2008 - May 2009

1. Project Profile and Japan's ODA Loan



Location of Project Site



Bongabong-Baler Road Mountain Section

1.1 Background

The Philippines has expanded its road length after the independence in response to road development needs with growing economies; The Philippine-Japan Friendship Highway (PJFH) that is a north-south arterial was constructed in the 1960's. Major arterials connecting to PJFH, rural arterial roads and rural access roads were also constructed in the 1970's and 1980's. The Government had put more emphasis on the expansion of road network till 1980's to serve for increasing road traffic demands. Thus, road transport has become the largest transportation mode in the Philippines with growing motorization together with the developed road network; 90 % of passenger and 55 % of freight transported by roads: 1993). In fact, the road improvement rate is higher among ASEAN countries (Road density in the Philippines is 0.54, whereas Thailand 0.34, Malaysia 0.12 and Indonesia 0.14 km/km² : 1993) .

On the other hand the priority was not given to the quality of roads because the priority had been given to the expansion of road length. As a result, there had been many unpaved arterial roads (Paved ratio was less than 50 %, whereas those of both Thailand and Indonesia are more than 90 %), which did not function well as arterial roads. Besides, these unpaved roads especially without proper disaster prevention measures were prone to damages by typhoons and torrential rains during rainy season. There are frequent cases where efficiency of transportation is spoiled by road closure during a disaster due to lack of alternative routes and insufficient disaster prevention.

Therefore, the Government raised the issues of securing safe and reliable transportation mode in the 1990's and began to shift the emphasis on strengthening maintenance, and function of roads as

network by improving and rehabilitating already well-developed and serviced road network. As stated above, road development/improvement in the Philippines needs to focus on qualitative upgrading rather than expansion of road length. Thus, in addition to north-south arterial roads the necessity of east-west arterials and circulating roads around major islands has increased.

1.2 Objectives

The objective of the Project is to improve the north-south arterial roads, east-west arterial roads and circular roads of major islands, which comprise National Arterial Road Network in order to promote human and material exchange, efficient transportation and cost reduction, thus contributing to vital economic activities and welfare of people in the project areas.

The location of the project sites is shown in Figure 1.



Figure 1 Location of the Project Site

1.3 Borrower / Executing Agency

The Government of the Philippines/Department of Public Works and Highways (DPWH), Project Management Office (Each Province and DPWH)

1.4 Outline of Loan Agreement

Approved amount / Actually disbursed amount	13.564 billion yen / 11.772 billion yen
Exchange of Notes/ L/A Signing date	Sept. 10, 1998/ Sept. 10, 1998
Terms and Conditions - Interest - Payment period (Grace period) - Procurement	2.2 %、Consultant: 0.75 %、 30 years (10 years), Consulting Service: 40 years 10years) General untied (Consultant: Partially untied)
Contractors	Hanjin Heavy Industries & Construction Co.Ltd. (Korea)、Sumitomo Construction Co. (Japan)、Sumitomo Construction Co. (Japan)/Cavite Ideal Construction & Development Corp. (Philippines)、Kumagaigumi Co., Ltd. (Japan)/Aboitiz Construction Group Inc. (Philippines)、C.M. Pancho Construction & Development Corporation (Philippines) /EEI Corporation (Philippines)/ Hanjin Construction Company, Ltd (Korea)、Mitsui-Sumitomo Construction Co. (Japan)/Cavite Ideal International Construction Corporation (Philippines)、China Geo Engineering Corporation (China) /China Road and Bridge Corporation (China) /C.M. Pancho Construction Inc. (Philippines)
Consultants	Nippon Engineering Consultants Co.,Ltd. (Japan)/Construction Consultants Corporation (Philippines)、Katahira & Engineers International (Japan)/Multi-Infra Konsult, Inc. (Philippines)/Pro Consult, Inc. (Philippines)/Schema Konsult Inc. (Philippines)/Techniks Group Corp. (Philippines)、Nippon Koei Co., Ltd. (Japan)/Philipp's Technical Consultants Corporation (Philippines)/PKII Engineers (Philippines)/United Technologies (Philippines)、Katahira & Engineers International (Japan)/Demcor Inc. (Philippines)/Filipinas Dravo Corporation (Philippines)/Multi-Infra Konsult, Inc. (Philippines)
F/S (Fasibility Study)	Japan International Coperation Agency (1993)

2. Evaluation Results (Rating: B)

2.1 Relevance (Rating: a)

2.1.1 Relevance of the Plan at Appraisal

The Medium-Term Philippine Development Plan, 1993-1998/ Medium-Term Public Investment Program, 1993-1998) set the objectives of the transport sector in the Plan. They are

to; a) strengthen interregional and urban-rural linkages to ensure people's mobility and continuous flow of goods; and b) ensure the safety and efficiency of transport services to meet the needs of an increasing population and dynamic market demands. The key measurable target of the road sector is to improve paved ratio of arterial roads upto 85 % and national secondary roads upto 60 % respectively in 1998. This indicates that the government puts emphasis on the investment of upgrading arterial road network, which is relatively well developed as far as the length is concerned in the country, by rehabilitation and improvement. This is quite a reasonable road development policy under the present road conditions. This Project is one of the reconstruction and rehabilitation of arterial highway programs clearly recognized in the Medium-term Philippine Development Plan.

2.1.2 Relevance of the Plan at Post Evaluation

The Medium-Term Philippine Development Plan (2004-2010) is a detailed roadmap toward achieving a common goal for reducing poverty through creating more jobs and enterprises. Six targets are set for this purpose. Among plans for economic growth and job creation, six important agendas are covered: some of which are agri-business, housing/construction, tourism, infrastructure and others.

One of the measures to improve competitiveness of Philippine enterprises in the basic strategy for enhancing trade and investment is, among others, modernizing infrastructure and logistics to make transport and related cost efficient. The priority should be given to the improvement and rehabilitation of well harmonized balance of the arterial highway network composed of north-south arterials and east-west roads for this purpose.

The strategy for road development to effectively use limited budgets is: 1) Maintenance of existing road facilities, 2) Repair and rehabilitation of damaged portions, 3) Widening and improvement of heavily trafficked sections, and 4) Development of new roads and missing links of the network.

The paved ratio of the Philippine arterial highways is relatively low: 50 % for national roads and 12 % for provincial roads, compared with neighboring countries (e.g. 90 % for national roads, and 79 % for provincial roads in Thailand). Some of the project roads are unpaved and impossible to pass through in the rainy season such as the Mindro West Coast Road and Bongabon-Baler Road, though they are located in the agriculture production and supply areas to the Metro Manila region. Other roads such as the Cebu South Road and P-J Friendship Highway (Visayasu section) have been suffering from deterioration of the pavement and heavy traffic jam due to traffic volume increase and over loaded vehicles in spite that they are crucial for economic development of the area. All of these road sections have a priority and should be urgently improved.

From the above, this project is consistent with the policies and strategies of the Philippines government.

2.2 Efficiency (Rating: b)

2.2.1 Output

The project description and output are shown in Table 1. The project consists of four road sections: i.e. Mindoro West Coast Road, Bongabon-Baler Road, Cebu South Road, and P-J Friendship Highway (Visayas section). The output was delivered almost as planned with some exceptions; 1) extension of rehabilitation length was made based on the newly found damages/variations during the detail design stage for San Jose-Rizal section); 2) the pavement length was reduced and limited to higher priority sections because construction costs exceeded the initially planned budget for the Sablayan-Sta. Cruz section).

Table 1: Project Description and Output

Name of Road	Section	Length (km)	
		Planned	Actual
Mindoro West Coast Road	San Jose-Rizal	14	As planned
	Sablayan-Sta. Cruz	55	25.5
	Mamburao-Abra de Ilog	38	26.2
Bongabon-Baler Road	San Luis-Ma. Aurora	11	9.5
	Ma. Aurora-Basal	4	1.4
Cebu South Road	Talisay-Naga	12	As planned
	Naga-Carcar	20	18.1
P-J Friendship Highway	Calbiga-San Juanico	46	As planned
	San Juanico Bridge Repair	2.61	As planned
Detail Designs	Mindoro West Coast Road San Jose-Rizal (14km) Sablayan-Sta. Cruz (55km) Mamburao-Abra de Ilog (38km)		As planned
	Bongabon-Baler Road (99km)		As planned
	Cebu South Road (32km)		As planned
	P-J Friendship Highway Alen - Calbayog (71km) Takloban - Riloan (148km)		As planned
Bridge (Construction/ Rehabilitation)	Mindoro West Coast Road	15	12
	Bongabon-Baler Road	4	As planned
	Cebu South Road	3	9
	P-J Friendship Highway	20	As planned



P-J Friendship Highway (San Juanico Bridge)



Mindoro West Coast Road (San Jose-Rizal)

2.2.2 Project Period

Overall delay of the project period was 25%. The period initially planned at the appraisal stage was from September 1998 to December 2003 (64 months), whereas, actual term was from September 1998 to February 2006 (80 months, loan closing date). The construction work was planned from January 2000 to December 2003 (4 years) but actual term was from May 2001 to February 2006 (4 years 10 months): ten months delay.

Reasons for delay are: 1) delay in selection of detail design and supervision consultants, 2) delay of start of detail designs, and as a result 3) procurement delay of construction contractors, which is the major delay of the overall progress.

For four road projects, it was planned to complete the consultant selection by November 1998 at the appraisal stage. However, actual selection of consultants for the Bongabon-Baler Road was delayed upto January 2000. The construction was planned to start in January 2000, but the earliest start among four road sections was February 2002 and the last was October 2003, which are substantial delay. The implementation schedule of procurement process seems to be too optimistic at the appraisal stage, which may have caused overall delay.

Generally, the construction delay for four road projects were within 150 %, which seems not to be quite delay in consideration of the following reasons:

- * Suspension of works due to delayed payment of billings,
- * Revision of design works/preparation drawings,
- * Revision of designs during detail design stage due to unforeseen site condition changes,
- * Detour route was damaged by typhoon,
- * Time suspension pending approval of Variation Order, and
- * Additional works.

2.2.3 Project Cost

The total project cost at appraisal was 18.085 billion yen, among which JBIC loan amount was 13.564 billion yen. The actual project cost was 20.317 billion yen (as of 2009) and JBIC

loan disbursed was 11.772 billion yen. The total project costs increased by 12 %, whereas yen loan portion decreased by 13 %, which is within 100 % of planned costs. The reduction of yen loan portion is because the only works completed by the loan closing date (January 10, 2006) were covered by the loan, and the rest of costs for the projects was paid by GOP. The devaluation of peso is one of the reasons for lower project costs.

The reasons for changes are: 1) Existing pavement was more deteriorated during the period before the preparation and construction stages, 2) Vertical alignment was revised according to the topographic conditions at site, 3) Quantity of work items was changed based on the site conditions, etc.. There was an additional repair of the San Juanico Bridge piers because the bridge was hit by a ship during construction as well as use of high- tension bolts for bridge rehabilitation.

2.3 Effectiveness (Rating: a)

2.3.1 Traffic Volume on the Project Roads

Annual average daily traffic volume from 2006 to 2008 in comparison with forecasted (expected) volume is shown in the Table 2. Traffic volume of all these sections is more than expected: Effectiveness is confirmed. Mindoro West Coast Road: Traffic growth of 50 to 60 % in the last two years can be seen in the northern part where a ferry terminal is located. Whereas, the growth remains 8 % in the middle of the island.

* Bongabon-Baler Road: Traffic growth is 7 % in the last two years.

* Cebu South Road: Traffic growth is 22 % in the Talisay-Naga section of the road.

* P-J Friendship Highway (San Juanico Br.): Traffic growth is 185 % in the last two years.

* Overall traffic growth in the last two years is substantial.

Table 2 Annual average daily traffic volume (AADT) of the Project Roads (Planned)

(unit: vehicle/day)

Road Name	Sections	2006	2007	2008
Mindoro West Coast Road	San Jose-Rizal	503 (258)	711 (271)	832 (286)
	Sablayan-Sta. Cruz	1,029 (301)	1,649 (316)	1,119 (332)
	Mamburao-Abra de Ilog	747 (264)	881 (278)	1,128 (292)
Bongabon-Baler Road	San Luis-Ma. Aurora	1,620 (898)	1,327 (947)	1,730 (999)
	Ma. Aurora-Basal	1,620 (898)	1,327 (947)	1,730 (999)
Cebu South Road	Talisay-Naga	15,460 (9,355)	17,532 (9,862)	18,814 (10,397)
	Naga-Carcar		8,079 (6,575)	8,252 (6,932)
P-J Friendship	San Juanico Bridge	2,867	4,679	8,181

Highway				
	Calbiga-San Juanico	1,565 (987)	2,309 (1,026)	3,393 (1,066)

Note; Figures in parenthesis are planned.

2.3.3 Benefit

(1) Travel Time Savings

When the weather was adverse such as in a heavy rain, some sections of the project roads were impassable or it took longer time to travel. The project contributed a lot to improvement of these conditions. The table below shows how the situation improved. All the sections have significant time savings and improvement of the situation except Cebu South Road, where data was not available. The objectives of the project were achieved by contributing to efficient transportation and cost savings.

Table 3 Travel Time Savings of Each Road Section

Road Section	Before Project		After Project		Current (2008)	
	Fair	Rainy	Fair	Rainy	Fair	Rainy
Mindoro West Coast Road (200km)	9 hr.	Impassable	5 hr.	6hr.		
Bongabon-Baler Road (11km)	50min.	Impassable	15min.	15min.	15min.	15min.
P-J Friendship Highway (Taclobann-Calbiga, about 46km)	80min.	95min.	45min.	50min.	50min.	55min.



Unimproved section (Earth road)



Difficult transportation on a gravel road

(2) EIRR

The economic internal rate of return (EIRR) at the appraisal stage is estimated using the total project cost and maintenance and operation costs as cost and operation cost savings, time savings in comparison with alternative routes as benefits. The EIRR value was 18 % for Mindoro West Coast Road, 30.1 % for Bongabon-Baler Road, 57.7 % for Cebu South Road, and 17.4 % for P-J Friendship Highway (Taclobann-Calbiga) . The EIRR at the post-evaluation stage calculated by the Executing Agency of the Cebu South Road is higher due to increase of

traffic volume than expected in spite of the construction cost increase by 27 %. Three other sections have lower EIRR values compared with the appraisal stage because of cost increase in comparison with the traffic growth. The cost increase of Bongabon-Baler Road and P-J Friendship Highway (Visayasu section) reaches 78 %. Although EIRR value at the post-evaluation stage is lower, it is considered that the project objectives are satisfactorily achieved.

Table 4 EIRR Comparison

Road Sections	EIRR (at appraisal)	EIRR (at completion)
Mindoro West Coast Road	18 %	12.4 %
Bongabon-Baler Road	30.1 %	24.3 %
Seb South Road	57.7 %	85.3 %
P-J Friendship Highway (Taclobann-Calbiga)	17.4 %	16.4 %

2.4 Impact

2.4.1 Socio-economic Development of Rural Areas

More convenient and safer national arterial road system brought by this project contributes to the economic development of each region through efficient domestic transportation of agriculture, fishery, wood and handicraft products. People along the Mindoro West Coast Road recognize the road contributes transportation of agriculture products. People along Bongabon-Baler Road also feel that this project contributes to transportation of agriculture and handicraft products.

Benefits brought by this project are summarized below based on the beneficiary survey (300 samples) of four roads:

- Increase of employment opportunities (78 % of respondents agree)
- Increased business chances (81 % agree)
- Reduction of traffic congestion in the target area (59 % agree)
- Increased family income (82 % agree)
- Increased transport of agriculture and industrial products (93 % agree)
- Increased access to the market of agriculture, wood and handicraft products (93 % agree)
- Increased access to the market, shops, schools, hospitals and public offices (90 % agree)
- Travel time savings (100 % agree)
- Travel cost reduction (64 % agree but 17 % disagree)
- Traffic safety improved (60 % agree but 12 % disagree)



Beneficiary Survey (Bongabong-Baler Road)



Increased Speed and Regularity of Commuting Buses

2.4.3 Environmental and Social Impacts

Impacts of water contamination and vibration problems foreseen at the appraisal stage were not observed during and after completion of the project. These problems were seemed to be minimal because the project roads are located in the rural areas and the construction is simply rehabilitation of existing roads.

About 58 % of people responded that there were no air pollution problems, whereas 24 % responded that it is difficult to judge and 19 % of them responded that there are some impacts and worsened of air quality. Fifty-five percent of respondents of the beneficiary survey indicated that there were no problems of noise, whereas 28 % answered it is difficult to judge and 17 % of them replied that noise became worse.



A Truck Raising a Cloud of Dust on the Gravel Road

2.5 Sustainability (Rating: b)

2.5.1 Executing Agency (Department of Public Works and Highways: DPWH)

The project was executed by the Philippine-Japan Loan Project Management Office (PJHL-PMO) of DPWH. Maintenance work of pavement repair and periodic maintenance have been practiced by District Offices, and City Engineering Office.

(1) Technology

Technical abilities of DPWH for road improvement and maintenance are satisfactory. More than half of 19,000 employees are engineers. DPWH has a system of training program for operation and maintenance. There are technical manuals for road planning, road design, standard specifications for road bridges, road operation and maintenance and road repairs, which are used for upgrading technical skills through regular training. Regular maintenance and repairs are based on maintenance standards determined by DPWH. Further training is required for engineers who are not well acquainted with modern machinery and equipment.

(2) Organization

DPWH has three-level organization: Head Quarters, Regional Offices, and District Offices. There are 15 Regional Offices and each Regional Office has several District Offices corresponding to administration units. DPWH HQ has 11 Project Management Offices (PMO) in charge of overseas assisted projects. Philippine-Japan Loan Project Management Office (PJHL-PMO) is in charge of JICA assisted projects.

The organization in DPWH in charge of operation and maintenance is the Bureau of Maintenance: BOM, which is responsible for budgeting and investigation of roads. Regional Offices, District Offices under BOM, and City Engineering Office are practicing maintenance work of pavement repair and periodic maintenance. Maintenance works except pavement are contracted out to private companies. Cleaning side ditches and grass cutting are done every month.

(3) Finance for Operation and Maintenance

The total length of national roads under DPWH is 30,000km. The total O/M budget of DPWH after establishment of road fund in 2003 increased from four billion peso in the previous year. However, actual expenses are 68,218 peso/km/year, which is lower than necessary maintenance budgets of 107,000 peso/km/year stipulated by DPWH (2007).

Actual maintenance budgets disbursed as of August 2008 were 2,133,479,876 peso, which is far lower than planned budgets.

DPWH budgets for the operation and maintenance of the national roads in the past nine year periods (1999-2007) are as the followings:

Table 5 Maintenance Budget of Each Year (unit : 000 peso)

Year	Allocation	Funding Source
1999	3,786,652	GAA
2000	4,093,667	GAA
2001	4,093,667	GAA
2002	4,080,371	GAA
2003	4,846,710	MVUC+GAA
2004	4,846,710	MVUC
2005	5,741,208	MVUC
2006	5,960,592	MVUC
2007	11,559,053	MVUC+GAA

2008	12,347,390(Plan)	MVUC+GAA
2009	12,777,617(Plan)	MVUC+GAA

注 : MVUC: Motor Vehicle User's Charge
GAA: General Approved Allocations (General Fund)

Table 6 Annual O/M budget of Each Road (2008)

Road Sections	Budget (peso)
Mindoro West Coast Road 107km	1,535,530
Bongabon-Baler Road 15km	
Cebu South Road 32km	1,163,280
P-J Friendship Highway (Taclobann-Calbiga) 46km	1,783,696

2.5.2 Present Conditions of Operation and Maintenance

It was observed through field inspection that pavement conditions of all the sections are generally good. But, there are some sections that have small holes on the pavement. Insufficient height of the embankment against flooding and overloading cause these deterioration. In addition to pavement maintenance, slope and drainage maintenance has been done. Restoration works have been undertaken to the slope sections damaged by heavy rains.

Cut and embankment slopes at one section between Calbiga and San Juanico were damaged by heavy rain. The pavement of this section was also damaged. The pavement and slope damages are most likely due to frequent typhoon hits every year. The repair work had been done and one-way traffic operation was practiced when the evaluation team visited the site. Prompt restoration was expected. The San Juanico Bridge repair seems to be satisfactorily done in spite of difficult site conditions.

Other sections of the project road had good pavement conditions, which showed the operation and maintenance were regularly and well done.

3.Feedback

3.1 Lessons learned

- 1) Construction terms are delayed substantially due to procurement (consultants and construction contractor selection/contract) delay. Past experiences show that the Government approval processing time is much longer than expected. It is necessary to plan a realistic implementation program and procurement schedule after careful negotiation with clients at the time of appraisal.
- 2) There were too many variations during implementation stage (work items, quantity, material changes etc.). It is necessary to upgrade supervision quality during construction and establish the appropriate auditing and inspection system as well as making efforts to improve accuracy and quality of the feasibility study.
- 3) A Project Completion Report (PCR) was not prepared based on the JICA format. The submission date within 6 months after the completion of the project was not observed. It is

needed to supervise/instruct the executing agencies to prepare a proper PCR within the time limit.

Comparisons of the Planned and Actual Figures

Components		Planned	Actual
①Output			
Road Rehabilitation (km)			
Mindoro West Coast Road	San Jose-Rizal	14	As planned
	Sablayan-Sta. Cruz	55	25.5
	Mamburao-Abra de Ilog	38	26.2
Bongabon-Baler Road	San Luis-Ma. Aurora	11	9.54
	Ma. Aurora-Basal	4	1.41
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	Cebu South Road	3	9
	P-J Friendship Road	20	As planned
②Term		September 1998~ December 2003 (5 years 4 months)	September 1998~ February 2006 (7 years 6 months)
③Project Costs			
Foreign Currency		11,008 million yen	11,772million yen
Local Currency		2,022 million peso	1,879.97million peso
Total		18,085 million yen	20,317 million yen
ODA Loan Portion		13,564 million yen	11,772 million yen
Exchange Rate		1peso=3.5 yen	1peso=2.28 yen