

**1. Project Description**



Project Site



Project Road  
(Bohol Circumferential Road)

**1.1 Background**

In the Philippines, the road network is the largest medium of transportation, handling about 90% of passenger transportation and 50% of freight transportation respectively. Because consideration of its functionality and quality was inevitably of secondary importance following concentrated investment to increase the road length until the early 80s, many arterial national primary roads and national secondary roads serving as key road networks, were unpaved (pavement ratio: National Primary Roads 71%, National Secondary Roads 47% (1999)) and did not function sufficiently as trunk roads. Also, due to damage caused by natural disasters and a lack of alternative routes in emergencies, traffic efficiency was often inhibited. To promote domestic personnel and material interaction and support revitalization of local roads as well, the development of a safe and efficient arterial road network were required immediately.

**1.2 Project Outline**

The objective of this project is to promote personnel and material interaction, efficiency and cost reduction in transportation by developing north-south and east-west arterial roads and circumferential roads in islands, which comprise major national roads, thereby contributing to stimulating and revitalizing the local economy and improving the welfare of the residents.

Approved Amount / Disbursed Amount	15,384 million yen / 15,251 million yen
Exchange of Notes Date / Loan Agreement Signing Date	December, 1999 / December, 1999
Terms and Conditions (loan)	Interest Rate 1.8 %, 0.75% (consulting service) Repayment Period: 30 years (Grace Period: 10 years), 40 years (Grace Period: 10 years) for consulting service

	General untied (Bilateral tied for consulting service)
Borrower / Executing Agency	The Government of the Republic of the Philippines / Department of Public Works and Highways
Final Disbursement Date	March, 2008
Main Contractors	Italian-Thai Development Public Company Limited (Thailand) / Cavite Ideal International Construction & Development Corp. (Philippines) / China Road and Bridge Corporation (China) / C. M. Pancho Construction Inc. (Philippines) / Hanjin Heavy Industries & Construction Co., Ltd. (Korea)
Main Consultant (Over 100 million)	Katahira and Engineers International(Japan) / Nippon Koei Co., Ltd. (Japan) / Design Science Incorporated (Philippines) / Inter-Structure Systems, Inc. (Philippines) / Philipp's Technical Consultants Corp. (Philippines) / Pacific Consultants International (Japan) / CTI Engineering Co., Ltd. (Japan) / Demcor Inc. (Philippines) / Pertconsult International (Philippines) / PKII Engineers (Philippines) / Engineering and Development Corp. of the Philippines (EDCOP) (Philippines) / Multi-Infra Konsult, Inc. (Philippines)
Feasibility Studies (F/S), etc. (if any)	“Bohol Circumferential Road Improvement Project I/P”(December, 1987), “Arterial Road Links Development Project (III) I/P”(October, 1996), “Southern Leyte Trunk Road Development Project F/S”(January, 1997), “Naga-Toledo Road Development Project I/P”(October, 1998) and “Japan-Philippines Friendship Road Typhoon Damage Restoration Project I/P”(December, 1998) (conducted by the Philippine side)
Related Projects (if any)	Arterial Road Links Development Project (III)

## **2. Outline of the Evaluation Study**

### **2.1 External Evaluator**

Ryujiro Sasao, IC Net Limited

### **2.2 Duration of Evaluation Study**

Duration of the Study: January, 2010 - December, 2010

Duration of the Field Study: 17 March - 10 April, 2010, 8 June - 7 July, 2010,  
5 - 18 September, 2010

### **2.3 Constraints during the Evaluation Study**

None in particular

## **3. Results of the Evaluation (Overall Rating: B)**

### **3.1 Relevance (Rating: a)**

#### 3.1.1 Relevance with the Development Plan of the Philippines

The development policy of the Philippines at the time of appraisal is shown in the development goal of transportation sector in the “New-medium term development plan (1999 ~ 2004) formulated under the Estrada Administration, namely to support the socioeconomic development of the Philippines by providing a safe and reliable transportation service, with strategies to achieve this including (1) reduction of government involvement in road development and promotion of utilization of the private sector, (2) enhancing the quality of existing infrastructure through appropriate renovation and maintenance management, (3) introduction of an appropriate legal framework and price policy to nurture the competitive market, and so on. In particular, as priorities toward achieving the abovementioned (2), ① Ensuring the high standard of arterial national roads and decentralization of road links development, and ②The introduction of the user charge principle in road development are established, and primarily under the Department of Public Works and Highways (DPWH), as well as renovations of arterial national roads conducted sequentially, consideration of the introduction of new funding sources in line with the user charge principle is underway.

This project falls into the above mentioned category of “① Ensuring the high standard of arterial national roads”.

Also during the ex-post evaluation, in the “Medium Term Philippines Development Plan (2004-2010)”, the development goals and strategies of traffic infrastructure sector are set out as follows:

- Improve access to domestic and international markets to ease poverty in local and remote areas.
- Enhance peace and security in areas of conflict through efficient traffic and commerce.
- Enhance national solidarity, family bonds and sightseeing by ensuring swift, economical and safe forms of transfer for people.
- Build a transportation logistics system which achieves efficient access between the business centre of the Manila metropolitan area and nearby states to ease traffic congestion in the metropolitan area.
- Develop traffic infrastructure at a minimum budget and debts.

As above, after the project is conducted, the importance of developing the traffic network

remains. Therefore, as well as during the appraisal, the Arterial Road Links Development remains a key part of the national development plan at the ex-post evaluation.

### 3.1.2 Relevance with the Development Needs of the Philippines

During the appraisal, all five roads involved in this project were unpaved or low-cost pavement, and in the interests of enhanced efficiency in crop distribution, activation of industrial or commercial activities, and sightseeing development as well, the need for road development (paving) emerged. The road development was expected to stimulate the economy of the surrounding areas and benefit local people as a result.

In addition, the change in the paving rates of major roads confirmed during the ex-post evaluation was as follows:

Table 1. The paving rates of major roads (Unit: %)

Type of road	1992	2009
National roads	50	75.15
- PCC (concrete paving)	27	47.45
- AC (Asphalt paving)	23	27.70
- Gravel	49	24.56
- Earthen roads	1	0.29
Provincial roads	12	41.99
- PCC	3	36.00
- AC	9	5.99
- Gravel	71	50.25
- Earthen roads	17	6.26

Source: Department of Public Works and Highways

For the period of nearly 20 years to date, the paving rates have grown drastically. Also according to the statistics of the Department of Land Transport and Communications, the number of registered vehicles in the Philippines increased from 3,701,173 in 2000 to 5,891,272, around 1.6 times, in 2008. Needs in terms of the use of national roads from the time of appraisal up to now are thought to be considerable.

In addition, as seen in the following, the traffic volume on the roads covered by this project has also increased steadily.

Accordingly, the need to renovate the roads in question since the appraisal time up to now was obvious.

### 3.1.3 Relevance with Japan's ODA Policy

According to the "Overseas Economic Cooperation Policy" issued by JICA (former JBIC) in 1999, the following statement was included related to the Republic of the Philippines:

"Emphasis is placed on the support for strengthening the economic structure for the purpose of sustainable growth, poverty alleviation and improvement of economic gap among regions, the support for environment protection including disaster prevention, and human resource/institution development." This project is related to "poverty alleviation and improvement of economic gap among regions".

According to the appraisal materials, JICA had a policy of supporting the economic infrastructure development in the area of transportation and so on to ease bottlenecks in economic development, and secure the sustainable growth of the Philippines. In particular, concerning the development of arterial road links, and starting with the Japan-Philippines Friendship road related project, they had focused on the development of north-south arterial road links, with consideration of the elongated north-south national land structure of the

Philippines until then, and also had a policy of engaging in the development of the arterial road linking east and west and circular roads in islands as well as north-south, to ensure the balanced development of the nation in future.

At the time of appraisal, the policy of JICA precisely served as a basis to promote this project and its relevance to Japan's ODA policy is high.

This project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

### 3.2 Efficiency (Rating: c)

#### 3.2.1 Project Outputs

The following chart shows the distribution of the project sites.

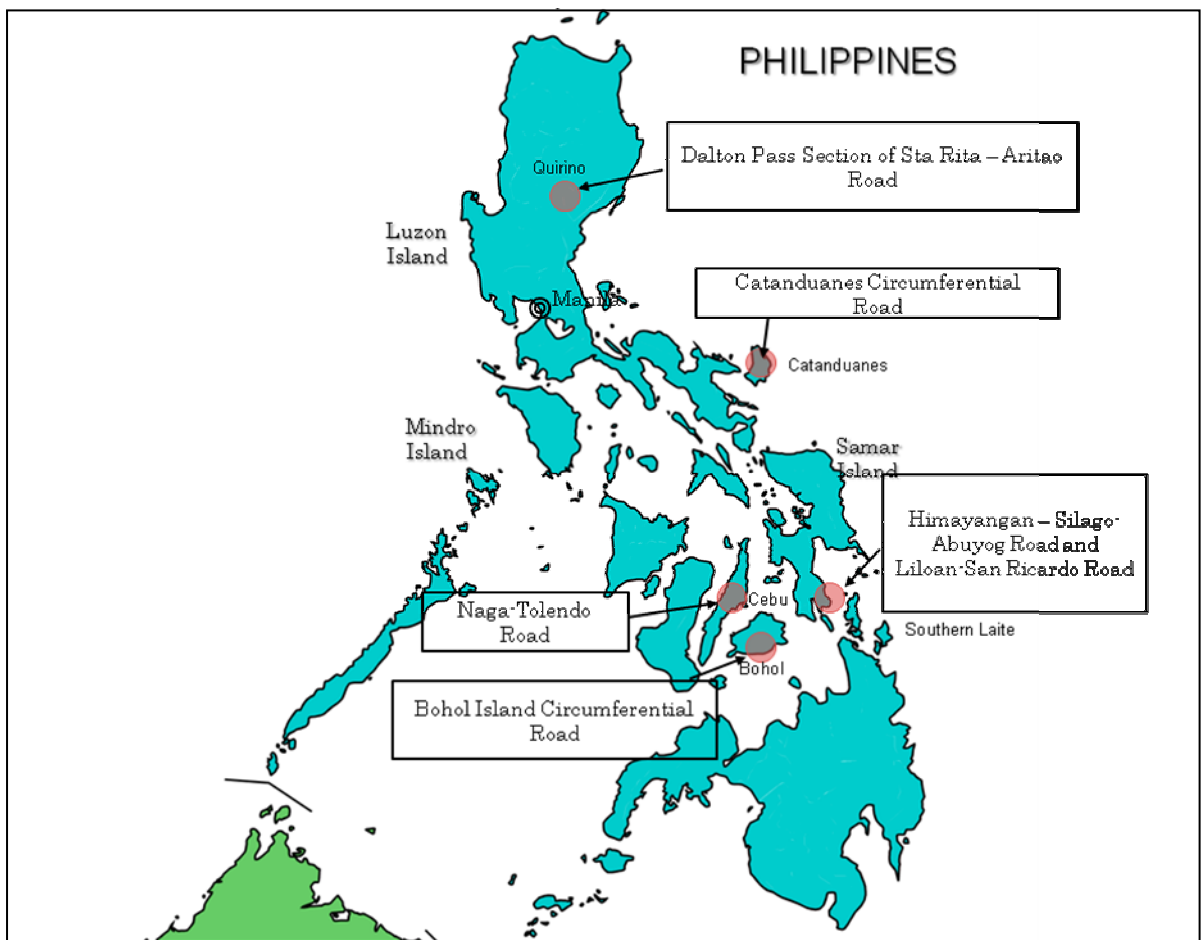


Chart 1. Project site location

Although there are minor changes, overall, the initially planned outputs were realized. These changes were due to security issues, countermeasures to problems which happened after the appraisal and addition of drainage facilities. All of the changes were necessary or important and contributed to the realization of project purpose.

Table 2. Comparison of outputs (Plan and Actual)

Plan	Actual	Differences and reasons
<p>1. Catanduanes Circumferential Road: Development of roads, bridges and so on (about 63 km)</p> <ul style="list-style-type: none"> <li>• Renovation of damaged bridges along Codon-Biga (about 63 km) and circumferential road (total length about 545 km), the PPCP construction method (Portland Cement Concrete, concrete paving) was utilized.</li> </ul>	<p>Development of roads, bridges and so on (43.11 km)</p> <ul style="list-style-type: none"> <li>• Renovation of damaged bridges along Codon-Biga and the circumferential road (total length about 397m, 5 bridges in total), the PPCP construction method was utilized.</li> </ul>	<p>The overall road length was shortened, however this is because the route of the roads was rearranged to be closer to the mountainside for safety reasons.</p>
<p>2. Bohol island circumferential road: Development of roads and so on (about 136 km)</p> <ul style="list-style-type: none"> <li>• Calape-Loay (about 67 km)</li> <li>• Loay-Candijay (about 69 km)</li> </ul>	<p>Although the total extension is the same, the descriptions of the road segmentation differ from before as follows:</p> <ul style="list-style-type: none"> <li>• Calape - Valencia (about 84 km)</li> <li>• Candijay - Valencia (about 52 km)</li> </ul> <p>There was the partial addition of scope (drainage facilities) and also in terms of the construction method, PCCP was adopted instead of planned ACP in some portions.</p>	<p>Although there were very few changes in scope, the partial development of drainage facilities on the side of the road (in Tagbilaran city), which was not initially assumed, was added. Also, in terms of the construction method, PCCP was adopted instead of planned ACP (Asphalt Concrete, Asphalt paving) for some portions. The abovementioned development of drainage facilities was in response to a strong request made by the mayor. Also the adaptation of PCCP was because it was tougher and also cheaper in terms of maintenance management.</p>
<p>3. Himayangan – Silago – Abuyog Road and Liloan – San Ricardo Road : development of roads, bridges and so on (about 136 km)</p> <ul style="list-style-type: none"> <li>• Himayangan-Sirago (about 61 km)</li> <li>• Sirago-Abuyog (about 38 km)</li> <li>• Liloan-Saint Richard (about 37 km)</li> </ul>	<p>The total extension of all three packages was 129.12 km, slightly shorter than the original plan. The construction and renovation of bridges is as planned. Also, in response to damage caused by e.g. typhoons and earthquakes, in each of the left three zones, scope which was not initially planned was added.</p>	<p>Himayangan-Sirago: Four approach roads, which were damaged by earthquakes, were renovated.(Earthquakes happened between appraisal and the start of construction.) In line with the request by the mayor, drainage facilities were developed in San Juan. So-called UK bridges, which had remained unfinished due to budget shortfalls, were renovated. Following a landslide disaster in a place called Guinsauggon, construction equipment was used to save lives.</p>

		<p>Sirago-Abuyog: There was a design change because the soil texture, which was irrelevant to the originally planned construction method, emerged.</p> <p>Liloan-Saint Richard: There was a design change due to damage by flooding just before groundbreaking.</p>
<p>4. Naga-Toledo Road: Development of roads, bridges and so on (about 37 km)</p> <ul style="list-style-type: none"> <li>• Naga-Toledo (about 37 km)</li> </ul>	Conducted as planned.	
<p>5. Dalton Pass Section of Sta Rita – Aritao Road: Renovation of the damaged portion of the road. (about 0.9 km)</p>	<p>The road length is the same. In addition to the originally planned scope, the following construction was implemented:</p> <ul style="list-style-type: none"> <li>• Paving to respond to fresh damage to typhoons “Feria” and “Harurot”</li> <li>• Reinforcement measures to respond to the deterioration of the road after the time of appraisal</li> </ul>	As described on the left.

Also, MM of consultant increased from the originally planned figure, due to the extended construction caused by poor weather, the response to additional construction due to typhoon damage, changed scope and so on.

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Period

For this project, the planned schedule was 5 years and 1 month from the L/A (Loan Agreement) signing date (September, 1999) to the completion of civil engineering work (September, 2004), however, the actual L/A signing was in December, 1999 and the whole civil engineering work was finished in November, 2007. In other words, the project period, which was scheduled to be 61 months, actually became 96 months, 157.3% of the planned amount, significantly longer than planned.

The respective causes of the delay were as follows:

1. Catanduanes circumferential road: Due to local (Philippines’ government) funding shortages, it took time to select a contractor, and due to poor weather and security problems (acts of vandalism destroying equipment), the construction schedule was delayed significantly.
2. Bohol island circumferential road: the Loay-Loon-Calape zone took 41 months against the originally planned 18 months, and the Candijay-Duero-Valencia zone took 32 months against the originally planned 18 months. For this road, significant time was required to acquire land in areas of high population density, which was noticeable, particularly in the Loay-Loon-Calape zone.

3. Himayangan – Silago – Abuyog Road and Liloan – San Ricardo Road: In all three zones, the originally planned construction periods (18 or 19 months) were exceeded by about 20 months. The main causes of delay were “operational delays due to poor weather”, “design changes”, “delays in payments for construction due to scope changes” and so on, with “operational delays due to poor weather” in particular the most influential cause. In response to these delays, the executing agency requested that the builders boost operations by inputting considerable equipment, however, because the poor weather was an external factor, it seems that the recovery was limited.
4. Naga-Toledo Road: The main cause of delay was the delay in making payment to contractors, due to the financial crisis of the government, which meant the construction period was extended. There was hardly any delay in the construction operation itself.
5. Dalton Pass Section of Sta Rita – Aritao Road: In this sub project also, delays in construction occurred due to funding shortages caused by financial difficulties. Also, in order to respond to site damage caused by typhoons, operations that had not been anticipated had to be carried out beforehand.

### 3.2.2.2 Project Cost

The originally planned project cost was 10,872 million yen in foreign currency and 2,517 million pesos in domestic currency (7,551 million yen\*), which was in total 18,423 million yen. Among the abovementioned 18,423 million yen, 15,384 million yen was yen loan, and the rest amount of 3,039 million yen was planned to be allocated by the Philippine government budget.

\*Exchange rate: 1 peso = 3 yen (as at January, 1999)

The project result was 7,749 million yen in foreign currency and 5,151 million pesos in domestic currency (11,282 million yen\*), a total of 19,031 million yen, and of this 19,031 million yen, 15,251 million yen was a yen loan, and the remainder of 3,780 million yen was allocated under the Philippine government budget.

\* Exchange rate: 1 peso = 2.1902 yen (weighted average during the project period)

The rate of actual cost to the plan in yen currency is 103.3%, which is slightly higher than planned. However, for information, in peso terms the total expense was 8,689 million pesos against the original 6,141 million peso, namely exceeding planned expenditure by 41%.

For each sub project, in peso currency, both construction and consulting fees substantially exceeded the original budget. The causes of the cost increase are summarized as follows:

Site (road)	Cause of cost increase
Catanduanes circumferential road	Increase in construction fee due to additional digging operation and operation to remove newly-found rock.
Bohol island circumferential road	Increase in construction fee due to the adoption of the PPCP construction method, which was not initially assumed and installation of drainage facilities in Tagbilaran city, which was also initially unplanned.
Himayangan – Silago – Abuyog Road and Liloan – San Ricardo Road	Plan change based on the actual site inspection, route change, increase in material fees and so on.
Naga-Toledo Road	Increase in consulting fees for additional



	surveys concerning the specific road portion.
Dalton Pass Section of Sta Rita – Aritao Road	Damage to the road caused by typhoon and partial change in the construction method.

Also, although the above represent the main causes of the increase in construction fees, due to the extension of the construction period as described above, there was also an increase in consulting fees.

The project cost was slightly higher than planned while the project period was significantly higher than planned, therefore efficiency of the project is low.

### 3.3 Effectiveness (Rating: a)

#### 3.3.1 Quantitative Effects

##### 3.3.1.1 Results from Operation and Effect Indicators

The changes in the yearly average traffic of the roads of this project are as follows, and they increase smoothly as compared with the forecast at appraisal.

Table 4. The changes in yearly average of daily traffic (AADT) (Unit: number of cars)

Road	Before project (2000) <sup>*1</sup>	Forecast at appraisal (2005)	After project (2009)
1.Catanduanes circumferential road			
San Andres - Virac	1,332 (1990)	2,006	4,334
Virac – Jct. Bato	1,393 (1990)	3,476	
San Miguel – Summit	257 (1990)	339	
Summit - Viga	341 (1990)	429	
2-1.Bohol island circumferential road (Calape- Tagbilaran)	1,081 (1990)	4,543	4,780
2-2.Bohol island circumferential road (Candijay-Jagna Valencia)	524 (1995)	2,005	4,320
3-1.Southern Leyte arterial road (Himayangan-Abuyog)	852 (1996)	3,193	718 <sup>*2</sup>
3-2.Southern Leyte arterial road (Liloan-San Ricardo)	617 (1996)	1,565	956
4. Naga-Toledo road	2,376 (1998)	6,360	16,991
5.Dalton Pass Section of Sta Rita – Aritao Road	936 (1981)	2,017	3,730

Source: DPWH

\*1. Figures in ( ) means year

\*2. It seems that there were differences in terms of survey points or survey method between appraisal and ex-post evaluation points.

#### Effect of VOC (Vehicle Operation Cost) reduction and time reduction

According to the calculation based on the data obtained from the implementing agency, the following benefit was estimated. (Figures are Net Present Value of VOC and time reduction

over the period of 20 years.)

(Unit: peso)

Road	VOC reduction effect	Time reduction result	Total
1. Catanduanes circumferential road	1,405,578	918,599	2,324,178
2. Bohol island circumferential road	4,254,405	1,855,787	6,110,192
3. Southern Leyte arterial road	1,606,771	2,216,111	3,822,882
4. Naga-Toledo road	2,929,072	1,363,618	4,292,690
5. Dalton Pass Section of Sta Rita – Aritao Road	756,698	413,379	1,170,077

### 3.3.1.2 Results of Calculations of Internal Rate of Return<sup>1</sup> (IRR)

The economic internal rate of return (EIRR) of this project, calculated based on the following assumptions were as follows, and overall, the EIRRs similar to those calculated at the time of appraisal were re-calculated and the economic profitability was estimated.

(Assumptions)

- Project life: 20 years
- Cost: Project cost
- Benefits: Reduction in VOC, reduction in maintenance management cost and so on

Table 4. EIRR Comparison of before and after the project

(Unit: %)

	EIRR at appraisal	EIRR* <sup>1</sup> at ex-post evaluation	Analysis of difference* <sup>2</sup>
1. Catanduanes circumferential road	24.4	20.81	-
2. Bohol island circumferential road	34.0	33.74	-
3-1. Southern Leyte arterial road (Himayangan-Abuyog)	27.9	16.51	Modifications of plan based on the site survey, route changes and increase of the prices of materials happened. Accordingly, as actual construction cost was approximate 2,045 million pesos against planned 1,203 million pesos, actual EIRR became lower.
3-2. Southern Leyte arterial road (Liloan-Saint Richard)	17.4	14.19	-
4. Naga-Toledo road	36.9	41.13	-

<sup>1</sup> Because this project does not generate income without toll fare collection, the financial internal rates of return (FIRR) shall not be calculated.

5. Dalton Pass Section of Sta Rita – Aritao Road	33.6	24.64	Typhoon damaged the road and there was a partial change of construction method. Accordingly, as actual construction cost was approximate 598 million pesos against planned 391 million pesos, actual EIRR became lower.
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\*1. For both project costs and benefits, the figures of the actual results are utilized.

\*2. Analysis was undertaken, when the difference is more than 5%.

### 3.3.2 Qualitative Effects

In two areas of Bohol and Southern Leyte, beneficiary surveys concerning the impact of this project were conducted (on residents and passengers)<sup>2</sup>. Based on the subsequent results of the beneficiary surveys, direct benefits such as reduced travel time, increased shipping volume of goods (mainly crops), improved forms of access, and so on were confirmed.

The total number of resident respondents was 360, who were residents living at the roadsides or neighborhoods of the roads involved in this project. The respondents were a virtually equal split of males and females, and their main occupations were employers (storekeepers and so on), farmers, blue-collar workers, civil servants, those with no regular job/housewives and so on. Over 70% of them (267 people) use the project road daily.

The following are responses concerning the direct benefits of this project:

- This project has brought increase in shipping volume of goods (mainly crops) (257 people which is more than 70% of the total).
- The traffic facilitation by this project contributed to the distribution of goods to and from further destinations (the former responses comprised 70% of the total, and the latter also exceeded 50% of the total).
- Reduced travel time was also realized. (for 330 people, comprising over 90% of the total, further 228 people, around 70% of 330, said that previous one-hour travel had been reduced by over 15 minutes.)
- Improved access was demonstrated by the following rates.

Destination	Rate of respondents who said access was improved (%)
Markets and stores	89.7
Social services (schools and so on)	74.2
Hospitals	67.8
Government offices	50.8
NGO offices	31.1
Others	4.4

The total number of passengers responding was 75, of whom the main occupations were drivers, employers (storekeepers and so on), farmers and so on. Over 80% of them (63

<sup>2</sup> We could not conduct beneficiary survey in all the project sites. Accordingly, we selected the survey sites carefully based on such criteria as budget scale of sub-project (preference on bigger projects), geographical distribution of projects (we tried not to select nearby sub-projects) and security (preference on less dangerous area).

people) use the project road daily.

The following are responses concerning the direct benefits of this project:

- This project has allowed an increased shipping volume of goods (mainly crops) (for 65 people, more than 80% of the total).
- The traffic easing quality of this project facilitated the distribution of goods to and from further destinations (the former and latter responses were beyond 60% and 50% of the total respectively).
- Reduced travel time was realized. (the responses of 68 people, over 90% of the total, also 39 people, around 60% of the total, said previous one-hour travel had been reduced by over 15 minutes.)
- Improved access was reflected in the following rates:

Destination	Rate of respondents who said access was improved (%)
Markets and stores	80.0
Social services (schools and so on)	61.4
Hospitals	57.3
Government offices	49.3
NGO offices	29.3
Others	1.3

In light of the above, this project has largely achieved its objectives, therefore its effectiveness is high.

### 3.4 Impact

#### 3.4.1 Intended Impacts

##### ① Bohol island circumferential road

The situation of the indicators concerning the impact on the Bohol area of the Bohol island circumferential road is as follows. The construction was completed in July, 2007.

Table 5. Impact indicators on Bohol

Indicator	2006	2007	2008	2009
Grain output (M.T.= Metric tons=1 ton)	464,658	509,194	581,194	632,906
Livestock output (M.T.)	28,749	30,994	32,635 (Interim)	-
Number of registered commercial and industrial offices	1,547	1,554	1,724	1,426 (Up to the number registered as of 6 November)
Number of new registrations of travel agencies	5	7	7	3
Number of tourists	418,030	531,812	567,174	-

Source: Department of Trade and Industry, Bohol sightseeing office, Bohol investment promotion centre, Tagbilaran city agricultural statistics

Concerning the two largest industries, namely agriculture and sightseeing, improvement in the indicators was seen before and after the project.

As seen in the results of interview to the stakeholders described below, the improvement of the road situation through this project is considered to have helped improve these indicators to some extent.

Concerning agriculture, the results of the surveys of beneficiaries (resident) also back up the above indicators. (The total number of resident repliers is 180 and they live along or near the project roads. The detail of beneficiary survey is attached as APPENDIX 1.) For example, in the results of the beneficiary survey, more than 60 % of the residents reported the increase of shipping volume of agricultural and other products. The survey result also shows that more than 60% of respondents answered “Yes” to the question “Do you think that the project has had an impact on expanding the destination of agricultural or industrial products?” and nearly 40 % of residents answered “Yes” to the question “Do you think that the project has had an impact on expanding the origin of agricultural or industrial products?”.

In addition, almost 30% of residents responded that “they had obtained new job opportunities”, while almost 70% responded that “their income had increased”. Likewise in environmental terms, there were many responses saying it had improved.

According to farmers, key factors behind the increased agricultural output of recent years include the improved logistics owing to the road development and the development of irrigation by dam construction nearby. In addition, the Bohol sightseeing office explained that the road development had improved the access to sightseeing areas so they felt the impact on the promotion of sightseeing was significant.

The following chart shows the location of the project roads.

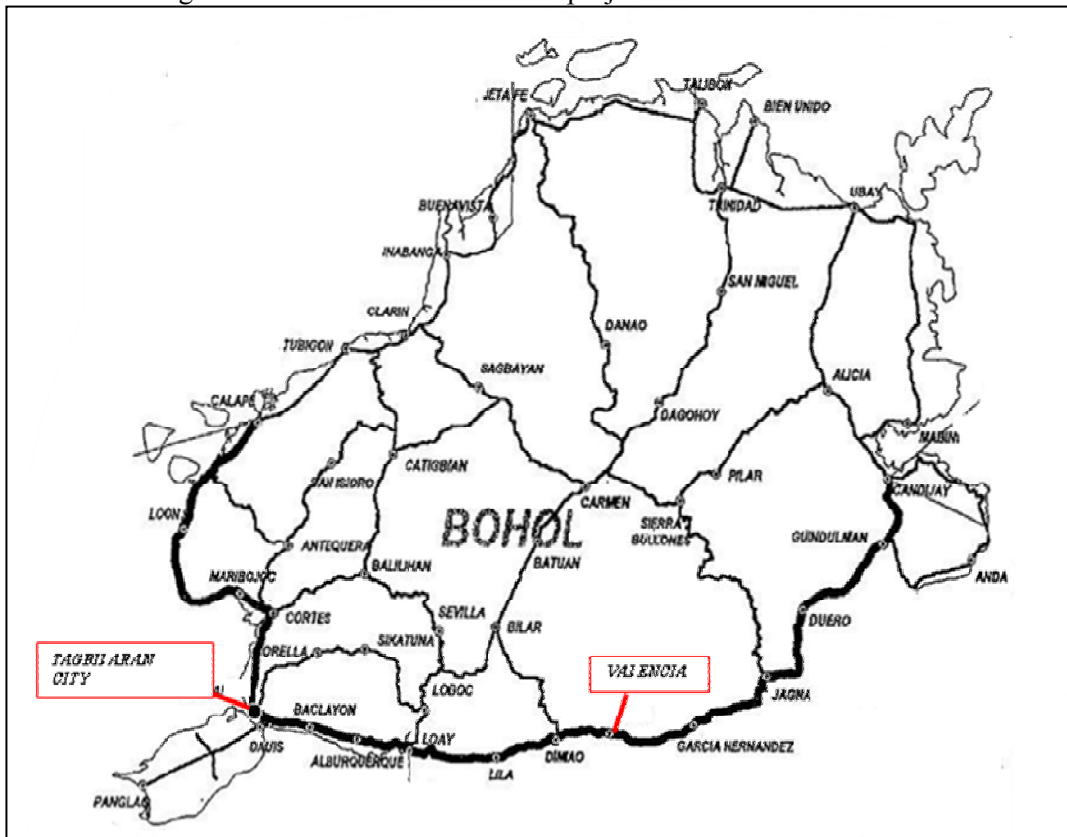


Chart 2. Location of the project road in Bohol (Thick line)

The following is a summary of the other interviews:

- Civil Engineering Division, Tagbilaran city: Because the access to each area had improved, the satisfaction level of the citizens is high.
- Barangay Captain, the largest town in Tagbilaran city: The surface of roads was smoothed, the traffic eased and access to each place has improved considerably.
- The consumer cooperative and private sectors (bus company, travel agencies and greengrocers) in Tagbilaran city: Jointly claimed that access has improved and that they enjoyed the benefits.
- Police office of Tagbilaran city: Number of traffic accidents on the project roads seems to be increasing. However, most seem to be bike accidents due to excessive speeding.
- Civil Engineering Division, Valencia city: Traffic has eased, and dust doesn't rise, so the citizens are satisfied.

② Himayangan – Silago – Abuyog Road and Liloan – San Ricardo Road (Southern Leyte arterial road)

The situation of the indicators concerning the impact by Southern Leyte arterial road is as follows. The construction was completed in October, 2007.

Table 6. Impact indicators on Southern Leyte

Indicator	2005	2006	2007	2008
Agricultural product output of Southern Leyte area: Banana (M.T.= Metric tons)	50,564	52,593	59,875	67,935
Agricultural product output of Southern Leyte area: Rice (M.T.)	82,451	84,413	86,902	99,934
Agricultural product output of Southern Leyte area: Corn (M.T.)	5,792	6,670	6,831	7,665
Number of registered offices	589	1,047	1,027	n.a.
Number of tourists	5,506	5,162	61,127	44,833

Source: Department of Trade and Industry, Department of Tourism, Tacloban agricultural statistics office

The agricultural output of Southern Leyte has been increasing steadily since 2005 in multiple areas. Although the growth post-2007, when the current project was completed, was remarkable, according to the Tacloban agricultural statistics office, the development of such agriculture was largely owing to farmers being supported by local government. However, in considering the results of beneficiary survey, half of whose respondents are farmers, the project is estimated to have contributed to the above indicators to a certain degree. (The total number of resident respondents is 180 and they live along or near the project roads. The detail of beneficiary survey is attached as APPENDIX 1.) For example, in the results of the beneficiary survey, more than 80 % of the residents reported the increase of shipping volume of agricultural and other products. The survey result also shows that more than 70% of residents answered “Yes” to the question “Do you think that the project has had an impact on expanding the destination of agricultural or industrial products?” and nearly 70 % of residents answered “Yes” to the question “Do you think that the project has had an impact on expanding the origin of agricultural or industrial products?”.

In addition, more than 40% of residents responded that “they had obtained new job opportunities”, while more than 70% responded that “their income had increased”. Likewise in environmental terms, there were many responses saying it had improved.

Also, the number of tourists to Southern Leyte rocketed just around the time the construction ended, to which this project also seems to have contributed to a certain extent. According to staff of a local branch office of the Department of Trade and Industry, the development of this project road and the Agas-agas Bridge contributed to the increase in tourists in recent years. With regard to the project road, it is used by tourists to move from Tacloban airport to a sightseeing area (Sagod Area) of Southern Leyte.

The following is a summary of other interviews:

- Civil Engineering Division, Abuyog city: This project has brought enormous benefits. In concrete terms, these include improved traffic between Abuyog and Sirago (which was previously mountainous and impassable), improved access to farmland, improved transport of agricultural products from Sirago, housing land development along the road, enhanced satisfaction among residents concerning roads, and so on.
- Police office of Abuyog city: Although the traffic was increased, an officer felt that the number of accidents had also increased.
- Barangay<sup>3</sup> Captain in Abuyog city: Access to nearby lands was improved.
- Bus company, travel agencies and greengrocers in Abuyog city: the bus company said the bus business along the route of this project road had expanded in terms of both the number of services and passenger numbers. With travel agencies, no clear benefits were confirmed. For greengrocers, because they purchase commercial products mainly from Manila, Davao and Cebu, this project had no particular benefits.

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<sup>3</sup> Local government of the Philippines consists of province, city/town, barangay and the barangay is the smallest administrative unit.

The following chart shows the location of the project roads.

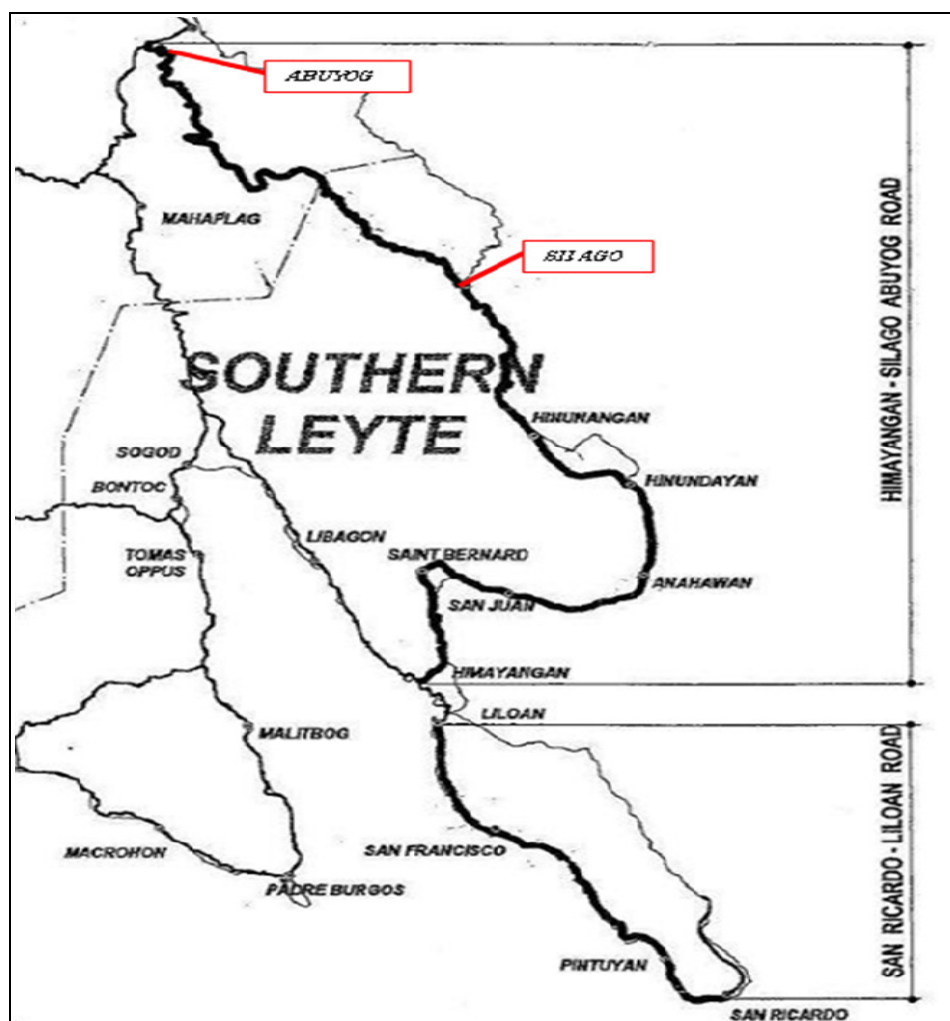


Chart 3. Location of the project road in Southern Leyte (Thick line)

③ Economic indicators of other project areas

The changes in output of “rice and corn” in three provinces<sup>4</sup> other than Bohol and Southern Leyte were as follows. As for the construction completion time of other than Bohol and Southern Leyte, Dalton Pass Section of Sta Rita – Aritao Road was completed in 2003, both Catanduanes circumferential road and Naga-Toledo road were completed in 2007. Considering the above increase of traffic and the results of beneficiary survey, it is estimated that the entire project may have also contributed to the agricultural production.

Table 7. Indicators on agriculture of three provinces other than Bohol and Southern Leyte

	2005	2006	2007	2008	2009
Rice (thousand tons)	251	270	277	286	285
Annual growth rate(%)	2.2	7.80	2.35	3.33	-0.12
Corn (thousand tons)	141	160	155	150	168
Annual growth rate (%)	-11.28	13.46	-3.11	-3.63	12.42

Source: Bureau of Agricultural Statistics website ([www.bas.gov.ph](http://www.bas.gov.ph))

<sup>4</sup> Provinces where other project roads are located.



### 3.4.2 Other Impacts

① Impacts on the natural environment: an Environmental Compliance Certificate (ECC) has been acquired in advance. Based on the environment assessment conducted by the Department of Environment and Natural Resources, the negative impact has been minimized.

The concrete examples are as follows (Bohol):

- Control of sediment volume excavated
- Appropriate disposal of excavated sediment
- Restriction of logging trees

Also in hearing the executing agency with an environment check list (the same as that used during the appraisal) in Bohol and Southern Leyte, no particular problem was seen<sup>5</sup>.

② Land Acquisition and Resettlement: Although land acquisition was conducted in Southern Leyte arterial road, for example, compensation for affected buildings and properties was conducted fairly by a provincial appraisal committee. Appraisals were conducted with regard to the standard prices used in tax payment, and although the negotiations with the residents took time, there were no particular disputes nor legal proceedings. However, with regard to Bohol island circumferential road, land acquisition took much time in high population density areas. More than 41 months were spent, while the plan was 18 months. The lengthy process of land acquisition was the major cause of the construction delay, hence it would be desirable to complete the land acquisition before groundbreaking of construction in future. It seems that in a small portion of the total, houses were relocated, but no problem was highlighted in particular (executing agency, beneficiary survey).

③ Unintended Positive/Negative Impact: No negative impact was seen in particular.<sup>6</sup>

Among the five project roads, the impact was scrutinized only in two areas, namely Bohol island circumferential road and Southern Leyte arterial road. However, from the point of view of improvement of economic indicators in regions including the project sites, the results of beneficiary surveys which support such indicators and the results of analysis of interviews to various stakeholders, the expected impact of the project such as the stimulated and revitalized local economy and improved welfare of the residents is estimated to be realized to a certain degree in these provinces. Negative impact on natural environment and others is not observed. Based on the above traffic indicators and EIRR figures, it is also estimated that the similar impact was achieved for the remaining three project roads.

## 3.5 Sustainability (Rating: a)

### 3.5.1 Structural Aspects of Operation and Maintenance

The DPWH Regional Office was supposed to be responsible for maintenance after the project completion, and the actual maintenance operation was supposed to be conducted by the District Office under the supervision of the Regional Office in direct management or by service contract. The roads developed in this project other than Southern Leyte are, in line with the above plan, maintained by the District Office (Bohol, Naga-Toledo, Catanduanes, Dalton Pass). However in Southern Leyte, the management responsibility for roads hasn't been transferred from the central PMO (Project Management Office) to the Regional and

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<sup>5</sup> Also based on the results of the abovementioned beneficiary survey, in terms of air pollution and noise, many stated that the situation had improved after the project (73.6% of the total answered that the air quality had improved, and 51.4% stated a noise reduction).

<sup>6</sup> In the results of the beneficiary questionnaire survey as well, very little negative impact was highlighted.

District Offices.

To reaffirm assurance with regard to road maintenance, the earliest possible transfer of such responsibility is desired.

### 3.5.2 Technical Aspects of Operation and Maintenance

The regular road maintenance method is as follows:

(Daily maintenance)

- Control of weeds
- Cleaning of bridges
- Maintenance of unpaved road shoulders
- Correction of ruts
- Cleaning of side ditches
- Embankment protective construction in disasters

(Regular/special maintenance)

- Signposting on roads
- Renovation of bridges, banking construction

According to a hearing survey and questionnaire response, staff was able to cope with the arising problems by themselves sufficiently. There is considered to be no problem in terms of the technological levels of the staff in particular. The number of staff is mostly sufficient, and their stability is also high. For road maintenance, manuals like that shown below are used, and the maintenance method is standardized in DPWH.

- ROADWORKS SAFETY MANUAL

- HIGHWAY SAFETY DESIGN STANDARDS

- MAINTENANCE BY CONTRACT MANUAL – 3rd Edition, October 1991

Also, staff training is regularly conducted at the initiative of the Regional Office.

With the above in mind, there is no particular problem in terms of the operation and maintenance technology.

### 3.5.3 Financial Aspects of Operation and Maintenance

The changes to the road maintenance budget of the whole DPWH in recent years were as follows: Every year a certain maintenance budget is secured.

Table 8. Road maintenance budget of the entire DPWH (Unit: million pesos)

Year	Routine/Carriageway maintenance	Roadside maintenance	Preventive maintenance	Total length of national roads (km)
2007 <sup>*1</sup>	2,021	1,750	7,300	29,968
2008 <sup>*2</sup>	4,021	1,850	6,690	30,224
2009	3,500	2,020	7,300	30,594

Source: Bureau of Maintenance, DPWH

\*1. In 2007, 720 million Pesos of so-called “Special Road Safety Fund” were also allocated.

\*2. In 2008, 663 million Pesos of “Road Safety Projects” were also allocated.

In this project, for each road, a certain level of maintenance fees are disbursed every year. A certain District Office was having a problem that although the minimum scale necessary for maintenance was secured, because the disbursement is not stable and given the uncertainty as to when the next budget grant would be advanced, the cash flow situation was very difficult (Bohol).

Examining the responses from each office, although the maintenance budget is not necessarily sufficient, the situation is not serious. Concerning the request on the timely disbursement of budget to a District Office, a remedial action is desired.

#### 3.5.4 Current Status of Operation and Maintenance

Based on the responses to the questionnaires by the executing agency and the visual inspection conducted by the evaluation team members including the local consultant<sup>7</sup>, the status is basically good. The status of the two areas actually inspected by the evaluation team members was as follows:

(Bohol)

Although there is a crack in a small portion, there are plans to repair it in the near future. Apart from that, there is no particular problem concerning their overall use.

(Southern Leyte)

There is no particular problem.

Also, according to the abovementioned beneficiary survey, 316 people, representing 88% of all respondents, were satisfied with the road maintenance status.

No major problems have been observed in the operation and maintenance system, therefore sustainability of the project is high.

## 4. Conclusion, Lessons Learned and Recommendation

### 4.1 Conclusion

Because this project has a high relevance with the development policy of the Philippines at the time of both the appraisal and ex-post evaluation, as well as the high consistencies with development needs and Japan's aid policy, the relevance is also high. Although the output originally planned was realized, the efficiency is low, because the project duration was substantially over the forecast level, and the project cost also slightly exceeded the budget. The effectiveness as seen in the operation and effect indicators and the internal rates of return is high and an impact was also created. No major problems have been observed in the operation and maintenance system, therefore sustainability of the project is high.

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

### 4.2 Recommendation

#### 4.2.1 Recommendation to the executing agency

In Southern Leyte, because the management responsibility of roads has not yet been transferred to the Regional and District Offices (at the time of site visit), the responsibility should be transferred at the earliest possible time to reaffirm assurances on road maintenance.

In Bohol, it is desirable that the Regional Office budget for operation and maintenance be disbursed timely or the disbursement time be informed in advance.

#### 4.2.2 Recommendation to JICA

None in particular.

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<sup>7</sup> The local consultant surveyed the "Dalton Pass Section of Sta Rita – Aritao Road" as well as accompanying the inspection of the Japanese consultant.

### **4.3 Lessons Learned**

In this project lengthening of the land acquisition was a major cause of construction delay. This means that not only the following project phase of construction was delayed but also construction process itself was affected by the simultaneously undertaken land acquisition. In this case it was time consuming because the population density was high at the project site. From now on they should allow enough time for the land acquisition in such a highly populated area and should complete land acquisition before the beginning of construction.

## APPENDIX 1. The summary of beneficiary survey (Impact)

1. The results of the beneficiary survey (residents and passengers) on the impact of this project conducted in Bohol were as follows:

The total number of **residents** responding was 180, who were residents living at the roadsides or neighborhoods of the roads involved in this project. The respondents were a virtually equal split of males and females, and their main occupations were employers (storekeepers and so on), civil servants, farmers, blue-collar workers, no regular job/housewives and so on. 80% of them use the road daily.

The following were the concrete responses concerning the impact of this project:

1. Job opportunity: Did you get any new job opportunities after this project?: Yes (27.8%), No (58.3%), No answer (13.9%)
2. Change in income: Did your household income increase after this project?: Yes (68.9%), No (23.9%), No answer (7.2%)
3. Did the shipping volume of crops and commodities increase?: Yes (60.6%), No (7.8%), Unknown (31.7%)
4. Did the shipping area of crops and commodities expand?: Yes (63.3%), No (7.2%), Unknown (29.4%)
5. Did the harvesting and producing area of crops and commodities expand?: Yes (37.2%), No (8.9%), Unknown (53.9%)
6. Change in the number of traffic accidents: Increased (56.1%), decreased (34.4%), Unknown (9.4%)
7. Impact on business properties and houses: There is an impact (26.1%)
8. Change in environment post-construction (only the main items extracted, response rate: %)

Item	Deterioration	No change	Improvement
Air	3.9	25.6	70.6
Noise	9.4	51.7	38.9
Water quality	0.6	62.2	37.2

9. Comprehensive evaluation of project benefits

Item	Rate of respondents (%)
Excellent	7.2
Good	57.8
Neutral	18.3
Slightly Negative	4.4
Very Negative	0.6
No Answer	11.7

The total number of **passengers** responding was 36, of whom 75% use the road daily.

The concrete responses concerning the impact of this project were as follows:

1. Did the shipping volume of crops and commodities increase?: Yes (86.1%), No (5.6%), Unknown (8.3%)
2. Did the shipping area of crops and commodities expand?: Yes (61.1%), No (2.8%), Unknown (36.1%)
3. Did the harvesting and producing area of crops and commodities expand?: Yes (30.6%), No (5.6%), Unknown (63.9%)

4. Change in the number of traffic accidents: Increased (44.4%), decreased (44.4%), Unknown (11.1%)
5. Comprehensive evaluation of project benefits

Item	Rate of respondents (%)
Excellent	5.6
Good	75.6
Neutral	8.3
Slightly Negative	2.8
Very Negative	0
No Answer	8.3

2. The results of the beneficiary survey (residents and passengers) on the impact of this project conducted in Southern Leyte are as follows:

The total number of the **residents** responding was 180, who were residents living at the roadsides or neighborhoods of the roads involved in this project. The respondents were a virtually equal split of males and females, and their main occupations were farmers, employers (storekeepers and so on), civil servants, blue-collar workers, and so on. Almost 70% (68.3%) of them use the road daily.

The concrete responses concerning the impact of this project were as follows:

1. Job opportunity: Did you get any new job opportunities after this project?: Yes (42.2%), No (41.7%), No answer (16.1%)
2. Change in income: Did your household income increase after this project?: Yes (74.4%), No (17.8%), No answer (7.8%)
3. Did the shipping volume of crops and commodities increase?: Yes (82.2%), No (2.8%), Unknown (15.0%)
4. Did the shipping area of crops and commodities expand?: Yes (73.3%), No (5.6%), Unknown (21.1%)
5. Did the harvesting and producing area of crops and commodities expand?: Yes (68.9%), No (6.7%), Unknown (24.4%)
6. Change in the number of traffic accidents: Increased (78.9%), decreased (11.1%), Unknown (10.0%)
7. Impact on business properties and houses: There is an impact (8.9%)
8. Change in the post-construction environment (only the main items extracted, response rate: %)

Item	Deterioration	No change	Improvement
Air	4.4	18.9	76.7
Noise	7.8	28.3	63.9
Water quality	0.6	53.3	46.1

9. Comprehensive evaluation of project benefits

Item	Rate of respondents (%)
Excellent	12.2
Good	67.2
Neutral	9.4
Slightly Negative	1.1
Very Negative	1.1
No Answer	8.9

The total number of **passengers** responding was 39 and 92.3% of the respondents who use the road daily.

The concrete responses concerning the impact of this project were as follows:

1. Did the shipping volume of crops and commodities increase?: Yes (87.2%), No (0%), Unknown (12.8%)
2. Did the shipping area of crops and commodities expand?: Yes (64.1%), No (5.1%), Unknown (30.8%)
3. Did the harvesting and producing area of crops and commodities expand?: Yes (74.4%), No (5.1%), Unknown (20.5%)
4. Change in the number of traffic accidents: Increased (76.9%), decreased (7.7%), Unknown (15.4%)
5. Comprehensive evaluation of project benefits

Item	Rate of respondents (%)
Excellent	17.9
Good	71.8
Neutral	5.1
Slightly Negative	0
Very Negative	0
No Answer	5.1

### Comparisons of the Planned and Actual Figures

Components	Plan	Actual
① Outputs	1. Catanduanes Circumferential Road: Development of roads, bridges and so on (about 63 km) <ul style="list-style-type: none"> <li>• Renovation of damaged bridges along Codon-Biga (about 63 km) and circumferential road (total length about 545 km), the PPCP construction method (Portland Cement Concrete, concrete paving) was utilized.</li> </ul>	Development of roads, bridges and so on (43.11 km) Renovation of damaged bridges along Codon-Biga and the circumferential road (total length about 397m, 5 bridges in total), the PPCP construction method was utilized.
	2. Bohol island circumferential road: Development of roads and so on (about 136 km) <ul style="list-style-type: none"> <li>• Calape-Loay (about 67 km)</li> <li>• Loay-Candijay (about 69 km)</li> </ul>	Although the total extension is the same, the descriptions of the road segmentation differ from before as follows: <ul style="list-style-type: none"> <li>• Calape - Valencia (about 84 km)</li> <li>• Candijay - Valencia (about 52 km)</li> </ul> There was the partial addition of scope (drainage facilities) and also in terms of the construction method, PCCP was adopted instead of planned ACP in some portions.
	3. Himayangan – Silago – Abuyog Road and Liloan – San Ricardo Road : development of roads, bridges and so on (about 136 km) <ul style="list-style-type: none"> <li>• Himayangan-Sirago (about 61 km)</li> <li>• Sirago-Abuyog (about 38 km)</li> <li>• Liloan-Saint Richard (about 37 km)</li> </ul>	The total extension of all three packages was 129.12 km, slightly shorter than the original plan. The construction and renovation of bridges is as planned. Also, in response to damage caused by e.g. typhoons and earthquakes, in each of the left three zones, scope which was not initially planned was added.
	4. Naga-Toledo Road: Development of roads, bridges and so on (about 37 km) <ul style="list-style-type: none"> <li>• Naga-Toledo (about 37 km)</li> </ul>	Conducted as planned.
	5. Dalton Pass Section of Sta Rita – Aritao Road: Renovation of the damaged portion of the road. (about 0.9 km)	The road length is the same. In addition to the originally planned scope, the following construction was implemented: <ul style="list-style-type: none"> <li>• Paving to respond to fresh damage to typhoons “Feria” and “Harurot”</li> <li>• Reinforcement measures to</li> </ul>



		respond to the deterioration of the road after the time of appraisal
② Term	September, 1999— September, 2004 (61 months)	September, 1999— November, 2007 (96 months)
③ Project costs Foreign currency Local currency  Total ODA Loan Portion Exchange Rate	10,872 million Yen 2,517 million Peso (7,551 million Yen) 18,423 million Yen 15,384 million Yen 1 Peso = 3 Yen (As at January, 1999)	7,749 million Yen 5,151 million Peso (11,282 million Yen) 19,031 million Yen 15,251 million Yen 1 Peso = 2.1902 Yen (Weighted average)

**Third Party Opinion**  
**Arterial Road Links Development Project (Phase IV)**

Josef T. Yap, Philippine Institute for Development Studies

The evaluation process adopts a straightforward methodology and judging from other projects, the methodology is applied consistently. The criteria and ranking are well defined.

When evaluating cost effectiveness, the exchange rate is allowed to vary. Hence the comparison of the budget at the start of the project and the actual cost in yen terms becomes misleading. The main reason is that the actual costs are in peso terms. The project evaluator argues that this is a rule that JICA has set. Nevertheless, as shown in the report comparing yen costs and local currency costs will generate different outcomes about cost efficiency.

The provinces where projects were undertaken are: Catanduanes, Bohol, Cebu, Southern Leyte, and Nueva Ecija-Nueva Vizcaya where the Dalton Pass goes through. In terms of poverty incidence in 2000, Catanduanes and Bohol were areas where infrastructure development was badly needed then.<sup>8</sup> Cebu and Southern Leyte were relatively better off but the project would have benefitted Leyte province, where poverty incidence was higher than the national average. It is the prioritization of Dalton Pass that is questionable since poverty incidence in Nueva Vizcaya is fairly low but the decision may have been caused by inertia since this is part of the Japan-Philippines Friendship Road. Moreover, this road was heavily damaged by the typhoon in 1998 and urgent repair from the damage was needed.

Poverty trends in these provinces has been mixed. There were major improvements in terms of poverty reduction in Catanduanes, Bohol, Cebu, Nueva Ecija and Nueva Vizcaya between 2000 and 2003. However, the improvements were not sustained between 2003 and 2006. Nevertheless, poverty incidence in 2006 was still lower compared to 2000. Poverty incidence deteriorated in Southern Leyte. Based on the data, it is likely the projects contributed positively to reducing poverty incidence.

The choice of Bohol and Leyte for the survey to evaluate effectiveness is fairly representative of disadvantaged provinces. The favorable impact of the project in Bohol can be partly deduced from the sharp fall in poverty incidence between 2000 and 2003.

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<sup>8</sup> Data on poverty incidence per province can be obtained from [http://www.nscb.gov.ph/poverty/2006\\_05mar08/table\\_1.asp](http://www.nscb.gov.ph/poverty/2006_05mar08/table_1.asp)