

Ex-Post Evaluation of Japanese Grant Aid Project
“Rehabilitation of Trunk Road”

External Evaluator: Keishi Miyazaki and Mitsue Mishima, OPMAC Corporation

0. Summary

The implementation of this project meets Ghana’s development policy, developmental needs and Japan’s ODA policy, therefore its relevancy is high. Although the project cost was within the plan, the project period was exceeded, therefore efficiency of the project is fair. Some effects were observed after the completion of the project, such as an increase in traffic volume, a decrease in travel expenses, savings in traveling time and improved velocity. In addition, there are positive impacts such as better convenience for local residents, support for agricultural development, activation of the local economy and support for the tourist industry. On the other hand, no improvements in road safety were observed and the relocation of local people is not yet complete. This problem still needs to be solved, as due to a change in the range of relocation targets during implementation of the project, there has been an increase in the number of residents and facilities for relocation. Accordingly, effectiveness of the project is fair. No major problems have been observed in the structural, technical and financial aspects of the operation and maintenance system, therefore sustainability of the project effect is high.

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

1. Project Description



Project Location



National Route N1
(Okyereco in Efutu Municipality)

1.1 Background

Ghana’s road sector is under the control of the Ministry of Roads and Highways, and there are three agencies, the Ghana Highway Authority (GHA), the Department of Feeder Roads, and the Department of Urban Roads, that are responsible for roads based on their classifications. The implementing agency for this project was GHA, which was in charge of development as well as the operation and maintenance of national roads, inter-regional roads and regional roads in Ghana (total of 13,277 km), 58% of which were unpaved. In addition, approximately 50% of national roads had poor road surface conditions. The target road section under this project was part of National Road No. 1 which forms part of the ECOWAS highway that connects the ECOWAS (Economic Community of West African States) countries¹, and which is ranked as

¹ The ECOWAS member states at the time of ex-post evaluation are the following 15 countries: the Republic of

one of the most important roads in Ghana. Although improvements of National Route N1 had been taking place with the assistance of other development partners, the target section of National Route N1 did not satisfy the standards of international trunk highways and its rehabilitation to meet these standards was an urgent matter. Thus the Government of Ghana requested a grant aid project assistance from the Japanese government.

1.2 Project Outline

The project objective was to improve transport capacity and passenger and cargo movement in the country by the rehabilitation of National Route N1 road between Kasoa and Yamoransa (98.2km).

| | |
|-----------------------------------|--|
| Grant Limit / Actual Grant Amount | (1) Detailed Design: 116 million yen / 104 million yen (2) First Phase (2003-2004): 2,776 million yen / 2,661 million yen (3) Second Phase (2004-2006) 3,763 million yen / 3,760 million yen |
| Exchange of Notes Date | (1) Detailed Design: October 2002 (2) First Phase (2003-2004): June 2003 (3) Second Phase (2004-2006): June 2004 |
| Implementing Agency | Ministry of Roads and Highways (MoRH) Ghana Highway Authority (GHA) |
| Project Completion Date | (1) Detailed Design: December 2004 (2) First Phase (2003-2004): April 2005 (3) Second Phase (2004-2006): November 2007 |
| Main Contractor | Taisei Corporation |
| Main Consultant | Katahira & Engineers International |
| Detailed Design | December 2002 |
| Related Projects | The following rehabilitation projects were undertaken in locations on National Route N1 other than targeted by this project. <ul style="list-style-type: none"> • International Development Association (IDA), the World Bank Group: Kasoa – Accra (18 km), Agona Junction – Elubo (110km). • Kreditanstalt für Wiederaufbau (KfW): Tema-Akatsi (110 km). • Danish International Development Agency (DANIDA): Takoradi – Agona Junction (28 km). • Millennium Challenge Corporation (MCC), USA: Tetteh Quarshie – Malam (14 km). |

Benin, Burkina Faso, the Republic of Cabo Verde, the Republic of Côte d'Ivoire, the Republic of Gambia, the Republic of Ghana, the Republic of Guinea, the Republic of Guinea Bissau, the Republic of Liberia, the Republic of Mali, the Republic of Niger, the Federal Republic of Nigeria, the Republic of Senegal, the Republic of Sierra Leone, and Togolese Republic.

2. Outline of the Evaluation Study

2.1 External Evaluator

Keishi Miyazaki, OPMAC Corporation

Mitsue Mishima, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: November 2010 – November 2011

Duration of the Field Study: June 4 – 19, 2011

2.3 Constraints during the Evaluation Study

None

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating: ③³)

3.1.1 Relevance with the Development Plan of Ghana

At the time of ex-ante evaluation, “Vision 2020”, the Ghana’s National Development Policy Framework prepared in 1996, set its long-term development objectives as: human development, economic growth, rural development, and urban development. For achieving the objectives, economic infrastructure development including road transport development was given priority.

The Medium-term National Development Policy Framework (2010-2013) at the time of ex-post evaluation also emphasizes the improvement of the trunk road network as a precondition for socioeconomic development. The Transport Sector Development Program (TSDP) (2008-2012) states its long term goals as, (1) to establish Ghana as a Transport Hub for West African Sub region, and (2) to create a sustainable, accessible, affordable, reliable, effective and efficient transport system that meets user needs. The Ministry of Road and Highways plans to apply the road fund⁴ in order to conduct improvements in, and the operation and maintenance of, major roads as a first priority in road sector priority.

3.1.2 Relevance with the Development Needs of Ghana

At the time of ex-ante evaluation, almost 50% of Ghana’s national roads (13,277 km in total length) exhibited poor road surface conditions. The target road section under this project was a part of the National Route N1, which forms part of the ECOWAS highway that connects the ECOWAS (Economic Community of West African States) countries, and which was ranked as one of the most important roads in Ghana. Rehabilitation of National Route N1 had been carried out through the support of other development partners. However, the target section of National Route N1 under this project did not satisfy the international standards for arterial highways and improvement to meet the standards was an urgent matter.

At the time of ex-post evaluation, National Route N1, as a part of the ECOWAS highway, is still considered to be an important part of the road transport infrastructure that connects the West African countries and in recent years, the improvement and widening of National Route N1, including the target section of this project, has been continuously worked on with the support of other development partners. While the ECOWAS highway links economically dynamic cities such as Accra, Abidjan (Côte d'Ivoire), Lome (Togolese Republic), Lagos

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory.

³ ③: High, ② Fair, ① Low.

⁴ The road fund was established in 1997 to be used for road development and maintenance. 90% of the financial source for the Fund is fuel tax while the remainder consists of the registration tax of vehicles and toll fees for roads, bridges etc.

(Nigeria) and other capitals of the West African coastal cities, it is also a route that connects landlocked countries and harbors, and it plays an important role in the logistic infrastructure of the West African region. In Ghana, the National Route N1 is the most important trunk road, covering economically active regions, from Accra to Tema, or Cape Coast to Takoradi. The Central Region, where the target road section of this project is located, is one of the most populated regions of the country and has 1.86 million people. Furthermore, traffic demand for the National Route N1 is increasing in pace with economic development in Ghana and its neighboring countries. Demand is expected to be even higher since oil field development on the west coast of Ghana and crude oil production started in December 2010.

3.1.3 Relevance to Japan's ODA Policy

The need for the improvement of trunk roads was stated in Japan's County Assistance Policy for Ghana (FY 2002) at the time of project planning. The original plan was to implement the project as an ODA loan project; however since Ghana was ranked as a Heavily Indebted Poor Country (HIPC) in 2001, the project became a grant aid project. Ghana is considered to be one of the Japan's most important aid recipient countries, and it was a fair decision to implement this project as a grant aid project responding to urgent needs. Thus, the project was relevant to Japanese development assistance policy.

From the above, this project has been highly relevant with the Ghana's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The planned output of the project was the improvement of the two lane road of the National Route N1, 98.2 kilometers in length, at the Kasoa and Yamoransa section (including improvement of road alignment, widening of lane width and improvement of pavement and drainage structures). The actual output was as planned (See Table 1). However, some malfunctions such as a crack and a depression of the surface were found in some sections of the second phase, additional repair works such as overlay and asphalt seal coat was done by the contractors to fix the problems during the period between the completion of the second phase and the final handover inspection. The target road section of the project on National Route N1 is shown in Figure 1.

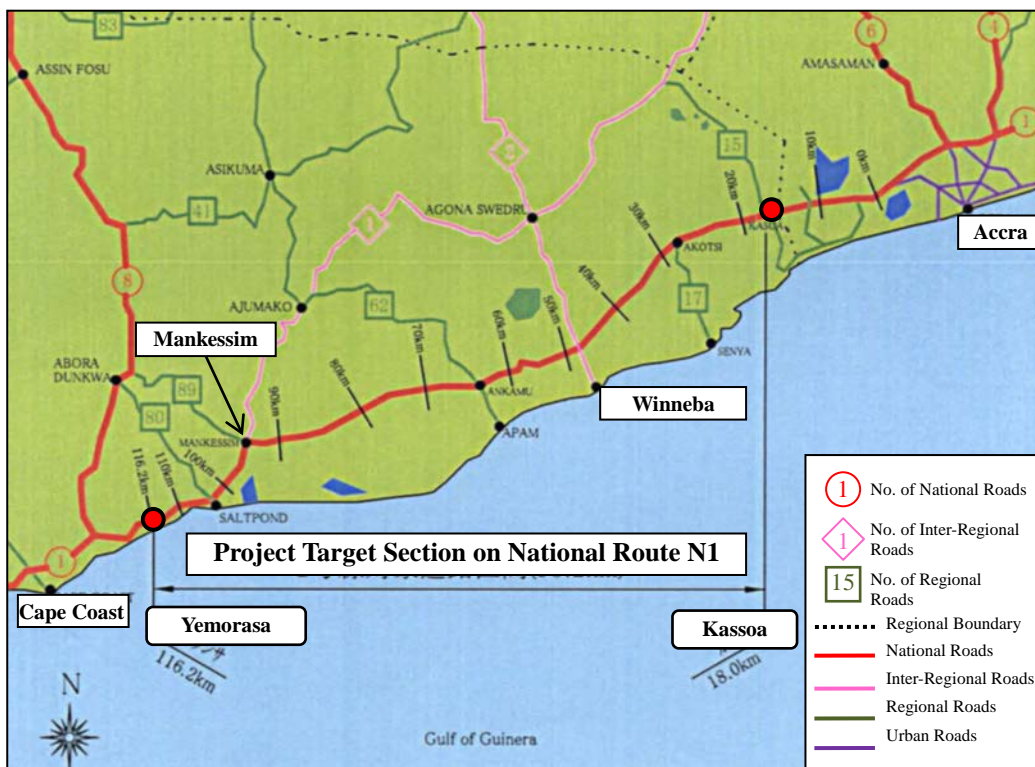
Table 1: Project Outputs

| Japanese Side | |
|---|---|
| Plan (At the time of the Basic Design Study) | Actual |
| <p>Improvement of the two lane road of the National Route N1, 1, 98.2 km in length, at the Kasoa and Yamoransa section (including improvement of road alignment, widening of lane width and improvement of pavement and drainage structures)</p> <ul style="list-style-type: none"> • 2- Lane road for two directions, with a lane width of 3.65m and a total width of lanes and shoulders ranging between 12.3m and 14.3 m. • Asphalt concrete pavement, mechanically stabilized crushed stone sub-base course, crusher run, and bituminous surface treatment shoulder • Drainage structures: box culvert, improvement of bridge drainage system, etc. • Other facilities: guardrails, guide posts, road humps, road signs, road marking, bus stops, roundabouts, etc. | <p>Total target interval 98.2km (First Phase: 41.0km, Second Phase :57.2km) was as in the plan.</p> <ul style="list-style-type: none"> • Specifications described on the left were as in the plan. |

| Ghanaian Side | |
|---|---|
| Plan (At the time of Basic Design Study) | Actual |
| Resettlement of residents and relocation of electric poles and water pipes by widening of road. | Relocation of the obstacles such as houses and facilities within the planned area at the time of Basic Design Study was implemented as the plan. The initially planned relocations area for the First phase section was within the area between the end of the road shoulder and 3 meters distance from it (which was 15.3-17.3 m from the center of the road). However, the relocation area was widened to the area up to the boundary of the Right of Way (ROW) of this road which was 30 meters from the center of the road because GHA took the decision to apply the policy that the houses and facilities located in the ROW should be cleared for the future 4-lane widening project of National Route N1. As a result, the number of relocated houses and facilities increased in the Second phase of this project. (The relocation issue is discussed later in 3.4.2 (2) Impact on the Social Environment). |

Source: JICA and GHA documents.

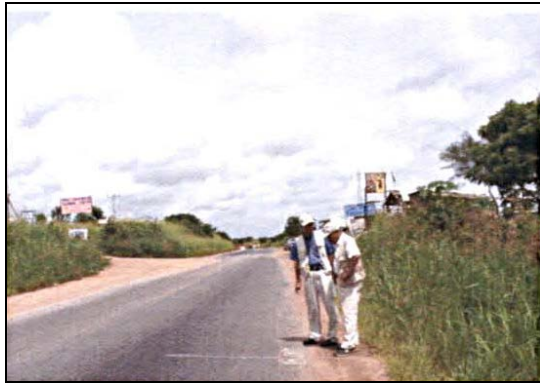
Note: The Right of Way (ROW) of this target road was the area which was 30 meters from the center of the road in both side, and ROW as well as a part of land ownership of the area was already acquired by the government. Therefore, principally the entire area of this ROW was to be a relocation area. However, at the planning stage of this project, the relocation area was limited within the area between the end of the road shoulder and 3 meters distance from it. The reasons were: (i) it was considered that even if the relocation was implemented in the limited area between the end of the road shoulder and 3 meters distance from it, it would not affect the construction work of this project as well as car traffic flow of the road after project completion, and (ii) the relocation cost would be less than the cost for entire ROW area.



Source: JICA “Basic Design Study on the Project for the Rehabilitation of Trunk Road in the Republic of Ghana” (2002)

Figure 1: Location of the Project Target for National Route N1

Before Project



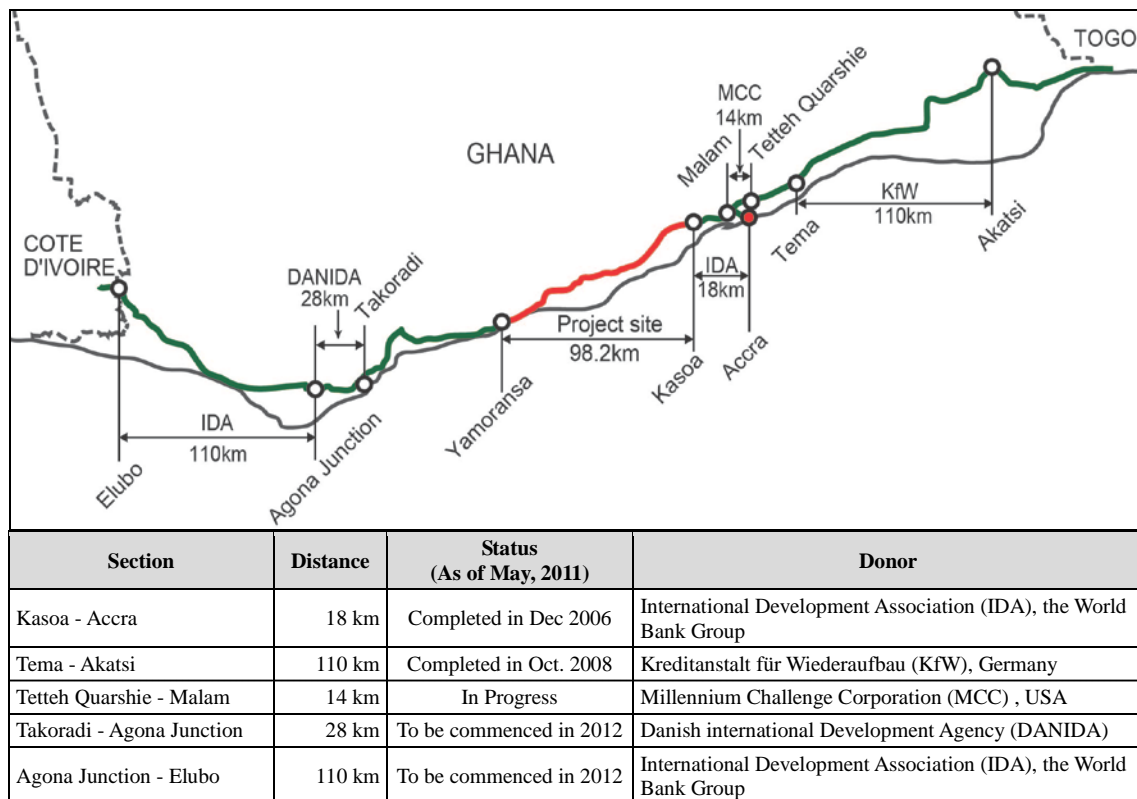
After Project (As of May, 2011)



Source: Photo before project is from JICA “Basic Design Study for the Project for the Rehabilitation of Trunk Road in the Republic of Ghana” (2002)

Photo 1: Beginning of the Project Road (Near Kasoa): Before and After the Project

Other development partners supported the improvement of the National Route N1 along with this project, and a section of 280 kilometers out of the total of 533 kilometers (52% of the overall length) has already been, or is in the process of being improved (See Figure 2).



Source: GHA

Figure 2: Rehabilitation Projects of the National Route N1 by Other Development Partners

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost was 65.26 million yen, which was lower than the planned cost of 67.45 million yen (98% of the planned cost). Around the same time as the project, Germany's Kreditanstalt für Wiederaufbau (KfW) carried out a road improvement project (2-lane road for each direction) for 110 kilometers between Tema and Akatsi on the National Route N1. The actual project cost for this was 53,000 US dollars per kilometer, which was approximately the same as the cost of this project: 50,000 US dollars per kilometer.

At the time of ex-ante evaluation, the cost for Ghana's relocation of houses and public facilities was estimated at 5 billion cedi. However at the time of ex-post evaluation, the actual relocation cost for this project cannot be identified since GHA could not trace the records on relocation including the actual relocation cost for the first phase of the project as well as for the actual relocation cost for the public utilities. The relocation cost was relatively small, only 1.4% of the total project cost, therefore it was decided not to include it as part of the project cost analysis in this ex-post evaluation.

Available records indicated that the relocation cost was revealed to be approximately 88.82 billion cedi, which was 18 times more than the planned cost as shown in Table 2. The reasons for the overrun were: (1) the planned relocation cost was estimated using a preliminary survey of only a part of the target road sections of the first and second phase; the overall relocation area was not covered, and the estimation did not include compensation for farms and crops, (2) the target relocation area was expanded during the second construction phase, and affected numbers houses and facilities for relocation increased, and (3) during the process of obtaining the approval of the government's National Land Valuation Board for the GHA relocation cost estimate, real estate values and compensation costs were revised which resulted in the increase in the compensation amount (See **1.9.2 (2) Social and Environmental Impacts** for more details).

Table 2: Project Cost

| Items | Plan (At the time of E/N Signing) | Actual |
|--|---|----------------------------------|
| [Japanese side] | | |
| Detailed Design | 11.6 million Yen | 10.4 million Yen |
| Construction supervision and civil works | 6.539 billion Yen | 6.421 billion Yen |
| Total | 6.745 billion Yen | 6.526 billion Yen |
| [Ghanaian side] | | |
| Resettlement and facility relocation costs | 5 billion Cedi ¹⁾ (90 million Yen) | 88.82 billion cedi ²⁾ |

Source: GHA

Note 1: Currency unit was changed from the old cedi to new the cedi in 2007, by conducting denomination 1: 10,000.

In this table, The Ghanaian cost in cedi was calculated in old cedi.

Note 2: Only Actual relocation cost revealed based on the available data. The relocation cost of public utilities such as water pipes is unknown.

3.2.2.2 Project Period

The actual project period from the commencement⁵ of detailed design to project completion was 53 months, against the planned period of 50.5 months, which represents a 2.5 month delay (104% of the planned period). As seen in Table 3, the first phase was 16 months against the planned period of 19 months, which was 3 months shorter. On the other hand, the

⁵ In evaluation analysis, the commencement of grant aid project is generally defined as the time of signing Exchange of Notes (E/N). For this project, however, the Basic Design Study report did not indicate a project period from E/N, and thus the comparative analysis of the plan and actual project period was carried out based on the assumption that the commencement of detailed design was the start of the project, not the signing of E/N.

second phase was 32 months against the planned period of 24 months, which represents an 8 month delay. The reason for the delay was that water pipe transfer along the national road took longer than originally planned. As described in the section of **3.2.1 Outputs**, for a year between the completion of the second phase and the final handover inspection, there was additional repair works to fix some distress; however, during this period, the road could be used.

Table 3: Project Period

| Item | Plan (As in Basic Design Study) | Actual |
|--|--|---|
| Total Project Period (From Start of Detailed Design to Completion of all road construction works) | 50.5 months | 53 months |
| Detailed Design | 5.5 months x 2 times | Phase 1: July to September, 2003 (3months) Phase 2: July to December, 2004 (6months) |
| Tender | 2.5 months x 2times | Phase 1: From Tender to Contract: July to September, 2003 (2 months) Phase 2: From Tender to Contract: January to March, 2005 (2 months) |
| Construction Works | Total: 42 months Phase 1: 19 months Phase 2: 24 months | Total: 47 months Phase 1: November, 2003 - April, 2005 (16 months) Phase 2: April, 2005 - November, 2007 (32 months) |

Source: JICA Documents

Although the project cost was within the plan, the project period was exceeded, therefore efficiency of the project is fair.

3.3 Effectiveness (Rating: ②)

3.3.1 Quantitative Effects

(1) Increase in Traffic Volume

The daily average traffic volume on the project target section between 2008 and 2011 significantly exceeded the target figures set in 2007 (the planned project completion year) and 2010 (three years after project completion) (See Table 4). Probable reasons for the increased traffic volume were: (i) the increase in the traffic volume of the National Route N1 due to improved convenience and better transportation functions overall after the rehabilitation and widening of other road sections by other development partners, in addition to the target road section of the project, and (ii) the increase in the traffic volume of the National Route N1 as the result of the economic development in Ghana and its neighbouring countries which promoted inter-regional trading, distributions and transfers. In addition, because there is one year's difference in the planned target volume and the actual figure when assessing the achievement ratio to target traffic volume, it can be thought that this have affected more or less the reason why the achievement ratio to target traffic volume in 2008 and 2011 was high (Please refer Note 1 of Table 4)..

Table 4: Average Daily Traffic Volume in Each Section of the Project Target

| Section | | 2002 | 2008 | 2011 |
|-----------------------|--------------------|--------------|----------------------|----------------------|
| Kasoa - Winneba | Plan ^{*1} | — | 11,974 (2007) | 14,262 (2010) |
| | Actual | 8,948 | 11,212 (94%) | 25,265 (177%) |
| Winneba - Mankessim | Plan ^{*1} | — | 6,615 (2007) | 7,878 (2010) |
| | Actual | 4,943 | 10,172 (154%) | 9,904 (126%) |
| Mankessim - Yamoransa | Plan ^{*1} | — | 5,518 (2007) | 9,904 (2010) |
| | Actual | 4,123 | 14,826 (269%) | 13,246 (202%) |

Source: Predicted traffic volumes are from “Basic Design Study for the Project for the Rehabilitation of Trunk Road in the Republic of Ghana” (2002), JICA. Actual figure in 2008 from GHA and actual figure in 2011 are from the results of a sampling traffic volume survey conducted upon the ex-post evaluation survey.

Note1: Since no estimated figures for 2008 and 2011 for each section were specified in Basic Design Study, the actual figures were compared with those from 2007 and 2010 respectively. Figures in () are the achievement ratio to predicted figures.

Note 2: The sampling traffic volume survey carried out by this ex-post evaluation survey was conducted for 24 hours, 2 days, namely, 24 hours from June 17, 2011 (Fri) 6:00am to June 18, 2011 (Sat) 6:00am, and 24 hours from June 18 (Sat.) 6:00 am to June 19, 2011, 6:00 am. It was implemented at the three target sections above. The average daily traffic volume in 2011 in Table 4 is the average traffic volume for the two days described above.

As shown in Figure 2, other road sections of the National Route N1 were improved by other development partners in recent years especially the road section adjoining this project, between Accra and Kasoa, which was improved with financial assistance from the International Development Association (IDA). Therefore, the increase in the traffic volume on the target road section of the project was also caused by improvements in other road sections of the National Route N1 at around the same time.

(2) Decrease in Vehicle Operation Costs

According to the International Roughness Index (IRI) which indicates the smoothness of a road surface, there was a level of 9 before the implementation of the project (2002). This improved significantly post-project to 3 in 2007 and 1.9-2.7 in 2010, as seen in Table 5. The aim in the plan was IRI=3 or less. This was the design standard of the ECOWAS Highway, and the goal was achieved. According to the GHA, vehicle operation costs improved significantly along with the improvement in road conditions, and the vehicle operation cost reduction effect was higher than estimated at the time of the Basic Design Study in 2007.

Interviews with road users (private transportation association representatives) revealed that frequency of vehicle maintenance decreased thanks to the road improvements and therefore the effect of the project in decreasing vehicle operation costs can be acknowledged (refer to later “Box”).

Table 5: International Roughness Index (IRI) in the Project Target Section

| Before Project (2002) | Target After Project (2007) |
|---|-----------------------------|
| 9 | 3 |
| Actual Figure After Project (each section) (2010) | |
| Kasoa - Akatsi | 2.4 |
| Akatsi - Winneba Junction | 2.2 |
| Winneba Junction - Apam Junction | 1.9 |
| Apam Junction - Mankessim | 2.3 |
| Mankessim - Saltpond | 2.7 |
| Saltpond : Yamoransa | 2.3 |

Source: GHA

(3) Savings in of Traveling Times and Improvements in Average Velocity

According to the GHA, as a result of the rehabilitation of the road, traveling times have decreased by 40% since 2007 (after project completion) compared to 2002 (before project implementation). Average velocity has improved from 50 km/hour to 80 km/hour (See Table 6). With the road surface improved by the project, velocity of vehicles was enhanced and traveling time reduced. On the other hand, problems in safety emerged due to the improvement in the velocity of vehicles (for details, refer to **3.2.2 Qualitative Effects (1) Improved Safety**).

Table 6: Traveling Time and Average Velocity in the Project Target Section

| Section | 2002 | | After 2007 | |
|-----------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | Traveling time (Minutes) | Average Velocity (km/h) | Traveling time (Minutes) | Average Velocity (km/h) |
| Kasoa - Winneba | 38.0 | 50 | 23.5 | 80 |
| Winneba - Mankessim | 54.0 | 50 | 34.0 | 80 |
| Mankessim - Yamoransa | 34.2 | 50 | 21.0 | 80 |

Source: GHA

Note: The designed speed on the project target road followed the design standard of GHA design: 100 km/h in flat terrain, 80 km/h in rolling Terrain, and 50 km/h in populated area.

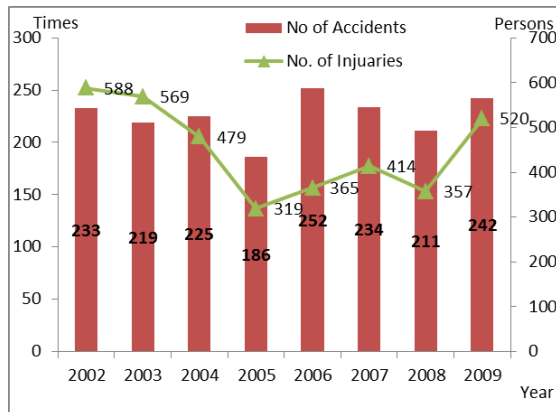
3.3.2 Qualitative Effects

(1) Improved Safety

The target road is a national trunk road that links ECOWAS countries, as well as being a community road for local residents. For traffic safety policy, the project implemented the following, in addition to the improved road alignment: (i) speed restraint with 50 km/h within the 36 towns and villages on the target section, (ii) widening of road shoulders in 24 locations in the above 36 towns and villages where there are many pedestrians, and the setting of curb stones at the roundabouts of Winneba and Mankessim, and (iii) setting up of pedestrian crossing and road signs in 22 locations. In addition, road humps⁶ were set in 12 locations at accident prone spots.

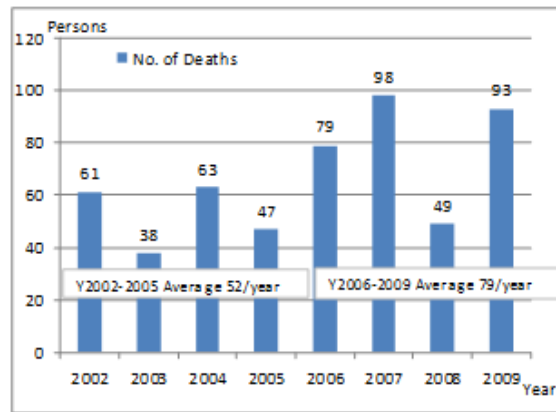
However, data showed no significant change in the numbers of traffic accidents and injuries pre and post-project, as seen in Figure 3 and 4, and thus no improved safety effect can be seen in the project. The annual average of fatal accidents between 2002-2005 (pre-project) was 52 deaths/year, whereas this number increased to 79 deaths/year between 2006-2009 (post-project). The number of deaths increased around 2006 when the project was completed. According to the local police in the target area, there is an awareness of the increase in pedestrian accidents and of more severe accidents since the implementation of the project. In some cases, the road humps themselves have caused accidents as drivers do not always reduce their speed when they enter road hump areas. GHA and local residents have also mentioned the issue of the increase in pedestrian accidents.

⁶ Raised ridges to reduce vehicle speed.



Source: GHA

Figure 3: Number of Traffic Accidents and Injuries (Kasoa-Yamoransa Section)



Source: GHA

Figure 4: Number of Deaths (Kasoa-Yamoransa Section)

After an analysis of the overall accident trends and the opinions of relevant people, the reasons why traffic accidents increased immediately after the project are considered to be enhanced velocity through improvement of the road, together with drivers' actions such as speeding as well as a low level of awareness about the issue of traffic safety on the part of pedestrians and drivers. The Basic Design Report of the project proposed to the Ghana side that "improvement of the road condition by the project will increase vehicle velocity. Ghana is thus required to conduct a traffic safety awareness campaign for local residents and drivers in order to avoid severe accidents". However, this proposal was not implemented until project completion.

Currently, the Government of Ghana is taking this problem seriously, and the National Road Safety Commission plans measures for increased traffic safety. GHA is in the process of strengthening traffic safety policy by replacing road humps with speed tables⁷ as there was no sufficient speed reduction effect seen from the road humps, while in fact they have been a cause of accidents. On the other hand, in order to improve traffic safety, it is necessary to improve road design and facilities, promote safety education for local residents and drivers, and government agencies and police are required to reinforce regulations against offenders. GHA is being encouraged to make efforts to prevent traffic accidents by promoting consultations and cooperation between local communities' residents, the police and other related agencies.

From the above, it can be seen that although some effects of project implementation were observed, effectiveness is fair due to the issues remaining to be solved in terms of the social environmental impacts of the resettlement of local people, as mentioned later.

3.4 Impacts

3.4.1 Intended Impacts

Key informant interviews with the Central Region Development Commission (CEDECOM), Mfantseman Municipality, West Gomoa, Awutu Senya District office, Central Region Tourism Board, local transporters, and local agricultural and commercial businesses were conducted, together with a focus group discussion for local residents, in order to understand the impacts of the project (for details, refer to "Box" mentioned later). Results revealed that impacts had been assumed from the beginning. Most of the interviewees and

⁷ A speed table is lower in height and longer in distance than a road hump and its structure prompts gentle speed reduction. According to GHA, speed tables are already in use on other road sections, and there has been a stable speed reduction effect.

discussion participants responded that they were satisfied with the project. The beneficiary population was 870,000 in the provinces alongside the project, and approximately 1,860,000, including the Central Region, where the road section of the project was located.

(1) Improvement in Convenience for Local Residents

After project implementation, social service access such as for schools, hospitals, and urban markets improved. Thus it can be said that the project contributed to an enhancement in convenience for local residents along the road.

(2) Support for Rural Development

Although there was no data related to agricultural products obtained in the target areas, some positive impacts were seen, such as time savings during the transportation of agricultural products, decreased transportation costs, improved access to markets, and decreased post-harvest losses (damaged agricultural products discarded during transportation). For this reason, farmers are now capable of selling more products than before and this has resulted in an increase in their income. Accordingly, it is deemed the project had had positive impacts in supporting rural development in the target area.

(3) Development of the Local Economy

After the implementation of the project, new branches of financial institutions appeared in the target area. The agriculture, tourism and service industries as well as commercial and transportation industries were stimulated, and an increase in employment opportunities in these industries was observed. At the same time, land prices in the project area increased. Therefore the project has had some positive impacts in activating the local economy.

(4) Support for Tourism Sector Development

According to the Central Region Tourism Board, following project implementation, there was an increase in the number of visitors to Kakum National Park, Fort of Cape Coast, to beach resorts along the coast and also to the number of hotels along National Route N1. Although in recent years there has been ongoing tourism promotion in the Central Region, with political support, bigger impacts in the above mentioned areas have been brought about by road improvement. Thus, the project has had positive impacts on the aspect of support for tourism in the target area.

**(BOX) Summary of Beneficiary Survey Results After the Improvement of the National Route N1
(Kasoa - Yamoransa)**

A beneficiary survey was carried out in order to analyze the project's effectiveness and impacts. Key informant interviews were conducted with the Central Region Development Commission (CEDECOM), Central Region Tourism Board, Gomoa West District, Awutu Senya District, Efutu Municipality, Mfantseman, Ghana Private Road Transport Union (GPRTU), woman's agricultural products retailers groups, police stations along the National Route N1, gas stations and restaurants. Also Focus Group Discussions (FGD) were conducted with three communities in Konmantse, Abandze in Mfantseman municipality and Ankamu in Gomoa West. These communities were selected from those located at the starting point (near Accra) and the end point (near Cape Coast) of the project, along the road and near junctions, with the idea that they could see project impacts from various aspects.

The results of the beneficiary survey are as following:



FGD at Amkamu Community



FGD at Kormantse and Abanze Communities



Interview with a group of woman retailers of agricultural products

[Reduced travel and transportation expenses]

- Transport costs for products and services between the local market centers (Kasoa, Mankessim, Cape Coast) were reduced (CEDECOM).
- Car maintenance costs were reduced. Repairs were necessary every three months before the project, but now the frequency of maintenance has lessened (GPRTU).

[Safety]

- Road humps were set in many places and they are causing accidents (CEDECOM, Gomoa West District, Efutu).
- There are many curves and they are dangerous for road users (Mfantisman).
- Accidents are caused because the road near Okyereco and Abofo is extremely narrow, and it floods after rain (GPRTU, Efutu).
- There have been more accidents because of speeding after road improvement (West Gomoa District, Efutu, Mfantisman, gas station owner). Accidents have increased especially after road improvement (restaurant worker). Accidents have increased as the traffic volume has increased (Efutu). Pedestrian accidents have increased (Mfantisman).
- Accidents have decreased after setting up speed tables. A major cause of accidents is the human factor (police station along the road).

[Improvement of the local resident's convenience]

- The project has contributed greatly in the transportation of emergency patients to hospitals in Kasoa and Cape Coast as access to these cities has become easier with the improved road (CEDECOM, Mfantisman, Gomoa West District).
- There are several junior high schools with a good nationwide reputation in Cape Coast. After the completion of the project, it has become easier to access Cape Coast and more students have enrolled in the schools there (CEDECOM).

[Support for rural development]

- Transportation time for agricultural products from Cape Coast and Accra has been reduced with the improved road, and post-harvest loss (damaged agricultural products discarded during transportation) has decreased (CEDECOM, Mfantisman, Gomoa West District).
- There is more investment in local crop production, and as a result, agricultural production has increased (Awutu Senya District).
- Yam distributors around Cape Coast used to buy in Kumashi, which meant a higher cost for transportation, but since the National Route N1 has become more convenient, buying takes place in Kasoa instead. As its result, transportation costs and time have been reduced (CEDECOM).
- Reduction in the transportation cost of agricultural products has resulted in the distribution of more agricultural products than before (Mfantisman, Efutu Municipality).
- I have been selling gari (processed cassava) for 20-30 years, and I used to carry them to the processing factory. After the improvement of the road, a transportation service has become available so more cassava can be transported, and income has increased (female retailer).
- It is now easier to get materials (fertilizers, etc.) and the cost has been reduced (Gomoa West District, Efutu, Awutu Senya District).
- Employment opportunities for young people have increased in the local area and there are more young people working in the local agricultural industry (CEDECOM, Gomoa West District, Efutu Municipality).

[Development of the local economy]

- A new agricultural produce processing plant (processing tropical fruits such as pineapples) has been constructed and the number of gas stations, restaurants, small retailers and shops has also increased (Mfantiman, gas station owner, Awutu Senya District). A new cement plant has been built after the road improvement (Gomoa West District).
- The income of transportation carriers has increased as the need for mass transportation and minibus operation has increased (GPRTU).
- Income has decreased since there is more competition with other newly opened restaurants (restaurant worker in Mfantiman)
- There are new eight bank branches in Mfantiman, and the city has become a center of business (Mfantiman). In Awutu Senya District, new financial institutions have been opened in the past four years, and currently, there are four banks and five non-bank financial institutions (Awutu Senya District).
- There are more employment opportunities as more people are doing business along the roadside of the National Route N1 (CEDECOM).
- There are new telecommunication companies and the local telecommunication environment has improved. Many young people work as venders of recharge cards for mobile phones and there are more employment opportunities for them (Mfantiman, Gomoa West District).
- The population has grown and housing construction has increased. 15,706 houses in 2006, and 45,896 houses in 2008 were newly built (Awutu Senya District).
- The district revenue has increased (Gomoa West District)

[Support for the tourism sector development]

- In the surrounding areas of the project target road, 34 new hotels were built between 2004 and 2010 (CEDECOM, Efutu).
- There has been an increase in visitors to local tourism facilities since the improvement of the National Route N1. Visitors increased from 108,000 in 2006 to 180,000 in 2010 at Kakum national park, and from 59,000 in 2006 to 89,000 in 2010 at the Cape Coast Fort (Central Region Tourism Board).
- There is an annual Aboakeyer festival in Winneba in May, and the number of tourists who visit the festival increased after the road improvement (Central Region Tourism Board, Efutu). More people visit the Akomosi festival in Apam (Gomoa West District). More tourists visit the coastline beach resort (Mfantiman).

[Satisfaction level of the project beneficiaries]

A survey was conducted with the participants of the focus group discussion, and more than 80% of them were "very much satisfied" or "satisfied to some extent" with the project. There were some people who were "not satisfied at all", but there appears to be a background of discontent to do with resident compensation or road accident measures.

| Level of Satisfaction | Kormantse and Abanze (Mfantiman, total 17 persons) | Ankamu (West Gomoa, total 14 persons) |
|--------------------------|---|--|
| Very much satisfied | 3 | 1 |
| Satisfied to some extent | 15 | 9 |
| Not much satisfied | 0 | 0 |
| Not satisfied at all | 1 | 4 |
| Do not know | 0 | 0 |

Source: Result of interview upon Ex-post evaluation survey.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

No impacts on the natural environment were assumed at the time of ex-ante evaluation, as the project was an improvement of the existing road. Neither the result of the project site inspection nor the hearing from GHA at the ex post evaluation revealed negative impacts on the natural environment.

(2) Impacts on the Social Environment (Relocation and Compensation)

GHA reported that resident relocation and compensation was processed according to public procedures and explained to residents. However, as described in the section of **3.2.2.1 Project Cost**, the overall result of the first construction period was not clearly verified.

As for the second construction period, the target number of relocation and compensation was 2,754 of which, 930 were huts and houses, and 1,664 were crop and farm compensations. An investigation conducted by the consultant of the project just before the beginning of the second phase period reported that there were 888 huts and houses; thus there had been an increase in number. Also, because the estimate did not include crops and farms which were in fact subjects for compensation, the number of compensation cases significantly increased. At the time of ex-post evaluation, it was confirmed that 120 cases had not yet received compensation. This was due to: (i) residents in the target relocation area had not moved to outside the Right of Way (ROW) of this road, (ii) some of the residents disappeared and their current contacts could not be identified, and (iii) ownership of property was in dispute due to death of owners or for other reasons.

The result of interview to representatives of three communities revealed that: (i) explanation from GHA on the relocation procedure had not been sufficient, (ii) the amount of compensation was not sufficient and they would suffer loss, and (iii) some residents received compensation without their houses being demolished while others did not receive money although their houses were demolished. In dealing with these issues, GHA reported that they had taken all the administrative procedures that were required.

Within the limited range of the interview survey at the time of the ex post evaluation it was not possible to judge whether or not there had been problems in the procedure for resettlement. It should be noted, however, that documentation on the results was incomplete and there had not been enough communication between the residents and GHA regarding the relocation procedures. These points need to be improved in the future.

According to GHA, there are plans to expand the target road from a two-lane single carriageway to a four-lane dual carriageway (a feasibility study has already been completed by GHA). Once the plan is implemented, those who currently have not been moved to outside the ROW will need to be relocated. Compensation will have to be paid fully at the time of actual construction in the future. This problem needs to be solved at the earliest time possible.

3.5 Sustainability (Rating: ③)

3.5.1 Structural Aspects of Operation and Maintenance

The operation and maintenance agency for the project target road, National Route N1, is the Ghana Highway Authority (GHA) under the Ministry of Roads and Highways. GHA is in charge of the development as well as the operation and maintenance of national roads, inter-regional roads and regional roads (total of 13,367 km). As of 2010, there were 1998 GHA employees, of which 197⁸ were in charge of operation and maintenance. The organization is seen in Figure 5.

About 90% of both daily and routine maintenance work is outsourced to the private sector, while GHA itself conducts direct maintenance and operation work (daily inspection of road conditions, patrolling and simple maintenance) as well as contract management, supervision of operations, quality control of outsourced maintenance administration works, control of GHA owned road construction equipment, and the establishment of annual operation and maintenance plans including budget planning.

⁸ At the time of ex-ante evaluation in 2002, the total number of employees in GHA was 3,300, of which 615 were operation and maintenance staff. Therefore, the number was 40% overall. A total of 70% of operation and maintenance staff was reduced between 2002 and 2010. According to GHA, the reasons for this significant decrease in numbers of staff were: (1) the employee count at ex-ante evaluation included temporary workers and, (2) while people retired or left work, GHA refrained from hiring new people.

The operation and maintenance offices and the branches in charge of the project target section of National Route N1, are the GHA Regional office in Cape Coast which is the regional capital of the Central Region of Ghana, and the GHA Area Offices in Cape Coast and in Winneba. There is a total of 30 technical staff. After analysis of the interview results to the director of the head office operation and maintenance department and the director of the region office in Cape Coast, it was concluded that there is no particular problem with the number of operation and maintenance staff in the project target road section.

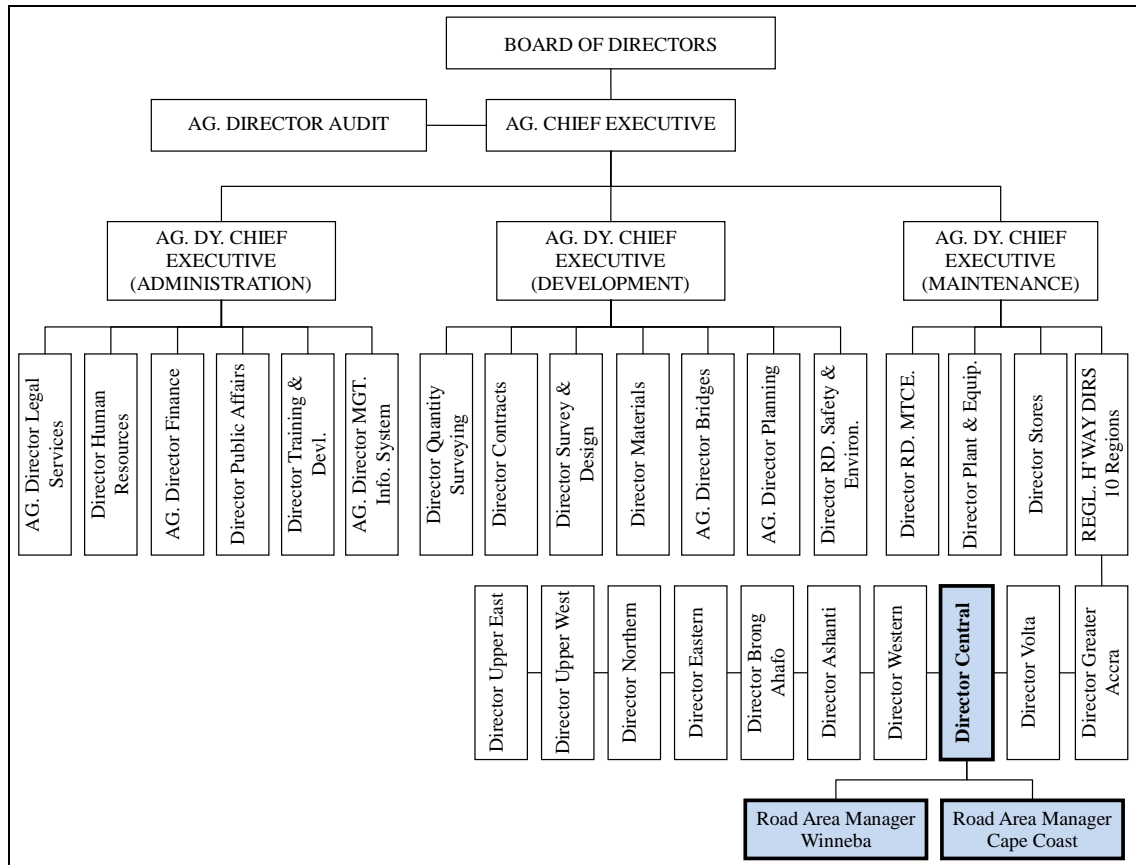


Figure 5: Organization Chart of GHA

3.5.2 Technical Aspects of Operation and Maintenance

About a half of the operation and maintenance staff at GHA (97 people) are qualified engineers with an average of 26 years employment history. GHA has a road operation and maintenance manual, and the operation and maintenance work is conducted based on the manual. As regards training for the engineering staff, GHA conducts an increasing number of training courses in addition to the ones financed by the World Bank and other development partners. The interview results to key staff of GHA at Head Office and the Central Regional Director of GHA in Cape Coast concluded that there was no concern regarding the technical level of their engineering staff considering past experience.

As mentioned earlier, although 90% of GHA road operation and maintenance works are outsourced, GHA explained that there is no concern regarding the technical level of the outsourcing agencies.

From the above, it can be concluded that there is no major issue in the technical level of the GHA operation and maintenance staff for maintaining the required road condition.

3.5.3 Financial Aspects of Operation and Maintenance

The operation and maintenance cost of the project target section of the National Route N1, between Kasoa and Yamoransa, increased yearly during the past four years from 172,000 cedi in 2007 to 268,000 cedi in 2010. Of the total GHA operation and maintenance cost, 0.3-0.7% is distributed for the operation and maintenance of the project target section and the executed budget equals the budgetary request. While there was a 46% decrease in the overall operation and maintenance cost of GHA between 2009 and 2010, the cost for the National Route N1 has increased by 35%, which implies that the National Route N1 is high priority in the operation and maintenance budget (See Table 7). According to GHA, the National Route N1 has the highest priority among all National Roads, and therefore its operation and maintenance budget is given preferential distribution.

The operation and maintenance cost is allocated from the road fund, the main source being fuel levy, which is contributed to the Fund anytime fuel is purchased by motorists. Although the main source of revenue is based on the road fund, some high cost and or large scale repairs such as overlays are funded by the general account or through financial assistance by development partners. The sustainability of operation and maintenance budget for the project target road is therefore considered to be secured at certain level.

Table7: Operation and Maintenance Budget of GHA and Project Target Section

Unit: 1,000 cedis

| Fiscal Year | O&M Budget for GHA | O&M Budget for National Route N1 (Entire section) | O&M Budget for Kasoa and Yamoransa (98.2km) |
|-------------|--------------------|---|---|
| 2007 | 39,750 | 930 | 172 |
| 2008 | 47,560 | 939 | 174 |
| 2009 | 66,310 | 1,074 | 199 |
| 2010 | 38,700 | 1,447 | 268 |

Source: GHA

However, the following need to be improved in order to secure sufficient operation and maintenance budget.

First of all, there is the issue of delayed budget execution. The interview result to the director of the Central Region office revealed that there is a procedural problem in that “the budget disbursement from the road fund takes time, and payment to the operation and maintenance contractors tends to be late”. The procedure for the budget execution needs to be improved and speeded-up.

Secondly, the road fund needs to be expanded. Currently the road fund is in cedi, Ghana’s local currency (cedi), while outsourced road maintenance contracts are in U.S. dollars as well as in Ghana cedis. This potentially causes difficulty when the value of the cedi is reduced against the U.S. dollars as this result in increases in the contract price in dollars. In addition to the exchange rate risk, there is also a problem in the source of revenue for the road fund coming from fuel levy. The base unit price of 0.06 cedi/liter has not been revised since its establishment of the road fund in 1997 despite changes in the economic environment such as inflation. While the road operation and maintenance cost continues to increase, it is necessary to strengthen and expand the road fund in order to assure the budget.

3.5.4 Current Status of Operation and Maintenance

As for the current status of operation and maintenance, overall quality of the road is relatively high. GHA introduced a Pavement Maintenance Management System (PMMS⁹) and

⁹ The Road Operation and Maintenance Department of GHA was equipped with a Pavement Maintenance and Management System (PMMS) with the support of German Technical Corporation (GTZ). With the data that the system collects, road conditions are assessed into three levels, i.e. “Good”, “Fair” and “Poor”.

evaluated the road surface condition of the project target road section. The result was indicated as “Good”. The International Roughness Index (IRI), which indicates the smoothness of the road surface was under the desired value of 3, and thus it can be seen that the target section is maintained in good condition.

According to the final handover inspection report of October 2008, the following recommendations were made to GHA: (1) maintenance manual must be established by GHA, (2) frequent patrol of the road must be done and prompt actions when finding the defect of the road must be taken by the operation and maintenance agency of the Central Region, (3) overloaded trucks must be strictly controlled by GHA, (4) the local activities which the road being dirtied by the local contractors should well control by GHA, and (5) the cleaning of the drainage structure and the cutting of trees and plants on the road shoulder the drains might be conducted by the local community. Of the above, (1) to (4) have already been implemented by the GHA regional office. Axle Load Controls have been set in place by the City of Elmina to regulate overloaded vehicles. As for (5), these activities have been contracted out to contractors, not to local communities, and the drainage structure is cleaned once or twice and the trees and plants cut three times a year. Implementation of operation and maintenance of the road appears to be mostly good.

However, for better operation and maintenance, some areas could be improved. The Basic Design Study suggested the cleaning of side ditches and drainage pipes four times a year which means that the actual frequency is less than was suggested. Also, the project site survey at the time of ex-post evaluation revealed problems in the drainage facility at the Winneba intersection (drainage defect due to insufficient cleaning and missing side ditch cover), a pavement dent on the culvert near Essuahyia, and damage to the road shoulders at the Kormantsue community. It is desirable that measures to deal with these defects are promptly taken.

As can be seen from the above, no major problems have been observed in the structural, technical and financial aspects of the operation and maintenance system, therefore sustainability of the project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The implementation of this project meets Ghana’s development policy, developmental needs and Japan’s ODA policy, therefore its relevancy is high. Although the project cost was within the plan, the project period was exceeded, therefore efficiency of the project is fair. Some effects were observed after the completion of the project, such as an increase in traffic volume, a decrease in travel expenses, savings in traveling time and improved velocity. In addition, there are positive impacts such as better convenience for local residents, support for agricultural development, activation of the local economy and support for the tourist industry. On the other hand, no improvements in road safety were observed and the relocation of local people is not yet complete. This problem still needs to be solved, as due to a change in the range of relocation targets during implementation of the project, there has been an increase in the number of residents and facilities for relocation. Accordingly, effectiveness of the project is fair. No major problems have been observed in the structural, technical and financial aspects of the operation and maintenance system, therefore sustainability of the project effect is high.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Follow up on the relocation, the compensation procedure and its results

At the ex-post evaluation, some differences were revealed in the views of residents and of

GHA concerning the matter of relocation and compensation. However, since there is no comprehensive report that gives detailed results and describes the process of resident and facility relocations, the actual facts cannot be confirmed. It is recommended that the resident relocation process of GHA is investigated to find out how it was conducted by the Ghanaian government and whether or it was done properly, as to plan. Analysis should also take place on the causes of dissatisfaction on the part of some residents. Results then need to be fed back to residents in order to promote mutual understanding. Also, it is recommended that a report is made on the analysis and the points for improvement of the resident relocation process which can then be reflected in future resident relocation, if necessary.

(2) Timely implementation of repair and cleaning

At parts of the project target section, drainage defects caused by insufficient cleaning, deterioration of road shoulders that have passed their design life of three years, road surface subsidence in the culvert, and missing side ditch covers have been seen. More of these problems can be expected as years go by, and it is desirable to solve these problems as early as possible.

Regarding drainage cleaning, it is recommended that countermeasures are discussed such as contracting with local communities and peoples directly and conducting cleaning more frequently at a lower cost, as mentioned by the consultant during the time of final handover inspection.

(3) Efforts for improved traffic safety in coordination with local communities, police and related organizations

It is recommended that the current road humps in the project target section are replaced with speed tables that have higher deceleration effect in order to reduce traffic accidents (which have shown a tendency to increase). It is also important to promote traffic safety education for drivers and local residents in coordination with the local communities and police. Further, it is necessary for the Ministry of Roads and Highways, police authority and the National Road Safety Commission to strengthen regulations for reckless driving and traffic violators.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

(1) A need for the effort to improve of traffic safely to be integrated with a road traffic safety awareness campaign

There is generally a tendency for the number of severe accidents to increase after road improvement projects like this. Major causes are lack of care of the part of drivers as well as a lack of traffic safety awareness on the part of pedestrians. From the view of social considerations, it is important that traffic safety education for drivers and local residents is provided in order to avoid any possible negative impacts. Although the Basic Design Study recommended a Ghana traffic safety awareness campaign in its basic planning report, this was not brought to action. Upon implementing road development and rehabilitation projects, it is necessary that the donor country discuss in advance firm requirements for traffic safety education and awareness campaigns to the recipient country. These should be a prerequisite which must be conducted by the end of the project

End