Ghana

Kumasi-Paga Road Rehabilitation Project

Report date: March 2001
Field survey: July 2000

1. Project Profile and Japan's ODA Loan

Site Map: major road network in the Republic of Ghana

Kumasi-Paga Road

1.1. Background

The most important transport corridor in the Republic of Ghana is the so-called Golden Triangle, which connects three cities: the capital, Accra; Takoradi, an export port; and Kumasi, the country's second largest city and a major transport hub. This corridor has served as a major route for transporting Ghana's principal export commodities (cocoa, gold, timber, manganese, bauxite and other products) to two trade ports (Accra and Takoradi). It runs from north to south through central part of Ghana, from Kumasi to the neighboring country of Burkina Faso via Tamale, Ghana's third largest city.

The Ghanaian government's 3-year public investment plan for the period from 1988 to 1990 called for 59% (¥120,300 million) of total investment, which stood at ¥203,600 million (362,988 million cedis), to be spent on economic infrastructure. Of the investments in economic infrastructure, 53% were targeted at the transport sector, 59% (¥37.1 billion) of which were allocated to roads; this indicates that roads were considered the most important aspect of the public investment plan. In particular, the present improvement project for the Kumasi-Paga Road, which links the vast northern region, containing half the total population, and the southern region, was given high priority in the overall investment plan for the road sector.

Five of the administrative regions along the Kumasi-Paga Road are major agricultural regions. Many development plans, including irrigation schemes and stockbreeding technology promotion programs, had been made, and these regions were expected to play an increasingly significant role as a major supply base for agricultural

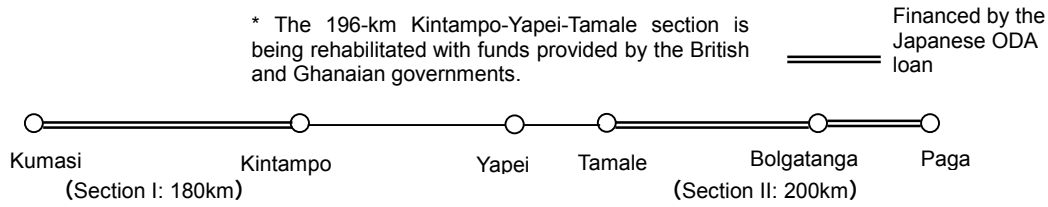
products. In the Kumasi-Kintampo and Bolgatanga-Paga road sections, however, potholes and ruts were becoming conspicuous on the surface. In the Tamale-Bolgatanga section, the road was so heavily damaged that its blacktop had practically disappeared. These problems hindered smooth distribution, creating a bottleneck in agricultural growth in the northern region.

1.2. Objectives

One objective of this project was to repair the major trunk road linking Kumasi with the northern border, thereby contributing to bolstering the agricultural foundation of the northern region. Another was to improve the trunk road extending from the northern border with Burkina Faso to the southern coastline in conjunction with the preceding industrial road rehabilitation project funded by Japanese ODA loan, thus promoting distribution and contributing to economic growth.

1.3. Project Scope

The ODA loan provided funds to all of the foreign currency portion and 50% of the local currency portion of procurement of i) the materials/equipment, and services required for civil engineering, and ii) the consulting services. The loan agreement was concluded in December 1990. The project road consisted of the 180-km Kumasi-Kintampo section, or Section I, and the 200-km Tamale-Bolgatanga-Paga section, or Section II, for a total of 380 km.



1.4. Borrower/Executing Agency

The Government of the Republic of Ghana/The Ghana Highway Authority (GHA)

1.5. Outline of Loan Agreement

Loan amount/Loan disbursed amount	¥8,439 million/¥8,437 million
Exchange of notes/Loan agreement	December 1990/December 1990
Terms and conditions Interest rate Repayment period (grace period) Procurement	: 2.5% p.a. 30 years (10 years) Partially untied
Final disbursement date	February 1999

2. Results and Evaluation

2.1. Relevance

The project road comprised part of the important north-south traffic route that linked Paga located in the north along the border with Burkina Faso, with Accra and Takoradi in the south. The project was part of the transport sector rehabilitation program supported by the World Bank. Ghana's Vision 2020 long-term development plan laid in 1995 and other subsequent plans also emphasized the importance of the road sector, including the trunk roads mentioned above. The project was relevant at the time of appraisal, and remains relevant. In the future, the project road section will continue to serve as a pivotal line connecting distribution and economic activities in the north with those in the south, and to be positioned as an important part of the transport infrastructure.

2.2. Efficiency

(2.2.1.) Project Cost

The project cost was initially estimated at approximately ¥9,450 million, but actual costs rose to ¥13,020 million. One reason was that it took seven years from appraisal, in 1988, to the start of construction. During this interval, GHA did not conduct sufficient maintenance on the project road, causing it to become increasingly worn. In addition, due to greater increases in traffic volume than expected and to other factors, road surfaces deteriorated rapidly, adding scopes of rehabilitation. Another reason was that Ghana's Ministry of Roads and Transport revised its road surfacing design standards, necessitating the review of designs and plan revisions. A third reason was inflation.

(2.2.2.) Implementation Schedule

At the planning stage, the implementation schedule spanned 53 months, from August 1990 to December 1994, but the project actually took 92 months, from December 1990 to July 1998. The actual completion occurred three years and three months later than projected, due to the considerable time required to review feasibility study plans and detailed designs and to revise implementation plans (a total of 32 months from September 1992 to April 1995 were spent reviewing detailed designs), which postponed the start of civil engineering work from January 1992, as initially scheduled, to May 1995.

One of the major reasons it took additional time to conduct the above-mentioned tasks was that after the feasibility study plans were completed, Ghana's Ministry of Roads and Transport revised its road surfacing design standards in 1989, making alterations to the detailed designs necessary. Another reason was that several of the conditions envisaged when feasibility study plans were developed had become

obsolete in the intervening three years. A third reason was that the revision of the detailed designs based on the reviewed feasibility study plans necessitated the revision of project plans and project cost allocation plans, and it took time to obtain approval for the revised plans.

2.3. Effectiveness

(2.3.1.) Increase in Traffic Volume

With the completion of the project, traffic conditions improved dramatically; the time required to travel between Bolgatanga and Tamale fell from seven to two hours. As a result, the traffic volume for the project road section grew overall as compared to initial plans, as shown in Table 1, and it can be said that the project contributed to increasing traffic volume and promoting distribution.

Table 1 Changes in the Traffic Volume for Road Sections between Kumasi and Paga

(Unit: Vehicles/day)

Sections	Plan	Actual (achievement level as compared to plan)	
		1998 (project completion date)	1999 (second year)
Kumasi-Techima	1,196	3,356 (280%)	3,582 (299%)
Techima-Kintampo	775	817 (105%)	838 (103%)
Kintampo-Tamale	1,604	674 (42%)	n.a.
Tamale-Bolgatanga	629	706 (112%)	n.a.
Bolgatanga-Paga	92	465 (505%)	500 (543%)

Source: GHA materials

(2.3.2.) Economic Internal Rate of Return (EIRR)

The results of recalculation of the EIRR indicated that the EIRR for the entire project was 15.8%, almost the same as the 16.0% estimated at the time of appraisal.

(Preconditions)

Project life: 20 years (5 years for construction and 15 years for post-completion operation/ maintenance)

Benefits: (1) Fuel and oil savings; (2) decline in wear on tires; (3) increase in the useful life of vehicles; and (4) savings on travel time, etc.

Costs: (1) Road construction costs and (2) operation and maintenance costs

2.4. Impact

(2.4.1.) Impact on the Revitalization of Local Economies

After the project was completed, the average traveling time between Bolgatanga and Tamale, both major provincial cities, was shortened from seven to two hours. As a result, Bolgatanga has grown as a trade and transport hub linking northern and southern Ghana and connecting Ghana with its neighboring countries -- including Burkina Faso, Niger and Mali -- and economic activities in these regions have become increasingly energetic. With the increases in traffic and distribution

volumes for the Kumasi-Paga section, meanwhile, many small markets have been established along the road, and local residents are actively engaged in small-scale commercial activities. Thus the project has had a certain economic impact on local communities.

(2.4.2.) Environmental Impact

There was no particular environmental impact during the construction period. Although increases in post-completion traffic volume were greater than expected, no particular environmental problems, including air pollution, have been reported so far.

2.5. Sustainability

As of March 2000, GHA had a total of 3,306 employees, and its organization comprised three major divisions: administration (249 employees), development (215) and maintenance (475). The maintenance division is responsible for the overall operation and maintenance of GHA-controlled roads. In addition to its head office, the division has ten regional offices nationwide, and annual regular maintenance is carried out under the leadership of the head office with routine maintenance led by regional offices. Routine maintenance consists of pothole patching, side ditch cleaning, grass cutting for hard shoulders and the leveling of unpaved roads. Routine maintenance is performed several times a year, though the frequency varies among sections. In 1997, GHA introduced the Pavement Management Maintenance Program (PMMP)[1], a maintenance method developed with the aid of the World Bank, which has since been implemented. In introducing the new maintenance method, GHA was also active in acquiring new technologies. Its efforts included providing practical training for all regional office employees and holding other educational programs, including various training sessions, seminars and workshops, on a regular basis. In addition, GHA has shifted from an in-house maintenance system to an outsourcing system using private contractors (90% of maintenance work is outsourced with the remaining 10% undertaken in-house). The role of GHA in maintenance operations is also shifting to coordination and supervisory functions, including maintenance planning, contract management and maintenance supervision. Placing orders for maintenance work with private enterprises, procurement, contracting and other operations are controlled by GHA's head office or regional offices, depending on the section, the scale and costs for maintenance. Although GHA has some maintenance equipment at its mobile

[1] PMMP is a system for promoting understanding of the condition of GHA-controlled roads in a unified manner and for prioritizing maintenance according to the degree of damage and deterioration. To those end, the condition of paved and unpaved roads as well as that of hard shoulders is rated according to the designated checkpoints, and information gathered by regional offices is analyzed by the GHA head office. GHA uses the results to develop road repair and budget allocation plans for the following year. Thus this system enables the agency to make efficient use of maintenance budgets and to implement maintenance operations effectively.

maintenance units, it basically utilizes the technology and materials/equipment of private contractors. It is striving to improve the road maintenance abilities of the private sector by, for example, providing opportunities to attend seminars and training programs.

Partly due to the improved maintenance system and institutional reforms described above, the operation and maintenance abilities of GHA have increased every year and the condition of trunk roads has gradually improved in the past few years (see Table 2).

Table 2 Condition of Trunk Roads

	Good	Fair	Poor
1998	19.4% (2,569.5km)	24.7% (3,271.5km)	55.9% (7,404km)
1999	32.7% (4,331.1km)	36.9% (4,887.4km)	30.3% (3,973.5km)
2005 (planned)	70%	20%	10%

Source: GHA annual reports

With the assistance of the World Bank, the Ghanaian government established the Road Fund to provide funds for the maintenance of roads nationwide. GHA also receives road maintenance funds from the Fund. Currently, the Fund covers approximately 70% of funds required for the maintenance of roads across the country. It is urged to consider strengthening the revenue foundation of the Fund in the future.

Comparison of Original and Actual Results

Item	Plan	Results
1. Project scope		
1)Design standards		
- Design speed	100 km/h (flat), 80 km/h (hill)	Same as left
- Width and the number of lanes	3.65 m/One lane	Same as left
- Width of road shoulder	2.0 m for one side	Same as left
- Pavement method	(a) Tamasi-Kintampo section (180 km) Asphalt overlay	(a) Tamasi-Kintampo section Simple pavement for the 7-km portion of the section and maintenance only for the other portions
	(b) Tamale-Bolgatanga section (170 km) New pavement, including roadbed construction	(b) Tamale-Bolgatanga section New pavement, including roadbed construction, for the 146.2 km portion of the section
	(c) Bolgatanga-Paga section (30 km) Asphalt overlay	(c) Bolgatanga-Paga section Asphalt overlay for the 23.0-km portion of the section and new pavement, including roadbed construction for the 15.9-km portion
2)Consulting services	267 M/M	275 M/M
2. Implementation schedule	August 1990 to December 1994 (53 months) (The signing of the loan agreement is considered the start of construction work)	December 1990 to July 1998 (92 months)
(1) Loan agreement	August 1990	December 1990
(2) Detailed design	August 1990 to January 1991	August 1992 to September 1993
(3) Bidding	January to September 1991	December 1994 to January 1995
(4) Evaluation of bids	October to December 1991	January 1995
(5) Civil engineering work	January 1992 to December 1994	May 1995 to July 1998
(6) Completion	December 1994	July 1998
3. Project cost		
Foreign currency	¥7,431 million	¥8,437 million
Local currency	¥2,016 million	¥5,473 million
Total	¥9,447 million	¥13,902 million
ODA loan portion	¥8,439 million	¥8,437 million
Exchange rate	GHC100 = ¥56.00 (November 1988) (US$1.00 = GHC230 = ¥129)	GHC100 = ¥9.45 (September 1998) GHC: Ghana cedi