

United Republic of Tanzania

FY2017 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Widening of New Bagamoyo Road”

External Evaluator: Tomoyuki Sho, IC Net Limited

## **0. Summary**

The objective of this project is to ensure smooth and steady traffic on the New Bagamoyo Road in Dar es Salaam by widening its 12.9-km target section between the Mwenge and Tegeta intersections, thereby contributing to the improvement of urban transport mobility and a reduction in the transportation cost of trade goods such as agricultural produce.

Because this project was consistent with Tanzania’s national development policy, road sector strategy, and development needs at the times of planning and ex-post evaluation, as well as Japan’s aid policy at the time of planning, its relevance is high. On the other hand, although the outputs of the project had been constructed and procured almost as planned, the project cost and the project period both exceeded the plan. Therefore, the efficiency is fair. As a result of improving New Bagamoyo Road, the driving time required during peak hours is reduced to a quarter of the level of the time of planning even at the time of ex-post evaluation, despite a dramatically increased traffic volume. Thus, the likelihood that the target of the average traffic speed would have been met had been measured immediately after project completion is high. In addition, the reduction of transportation cost is achieved to a certain extent, as the fuel cost of a traffic vehicle has been lowered due to a shorter driving time. Moreover, urban transport mobility is improved as the availability and frequency of public bus services have substantially increased after project completion. As evidenced by residential land and commercial developments along and near the road, positive impacts on fueling the local economy and increasing employment opportunities have also been recognized. Therefore, the effectiveness and impact of the project are high. As for the operation and maintenance of New Bagamoyo Road, no problems have been identified in terms of the institutional, technical, and financial capacities of the executing agency. However, there is some problem in the status of operation and maintenance because flooding and surface ponding in some roadside areas outside the road construction sites have become worsened after project completion. Therefore, the sustainability of the project is fair.

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

## 1. Project Description



Project Location

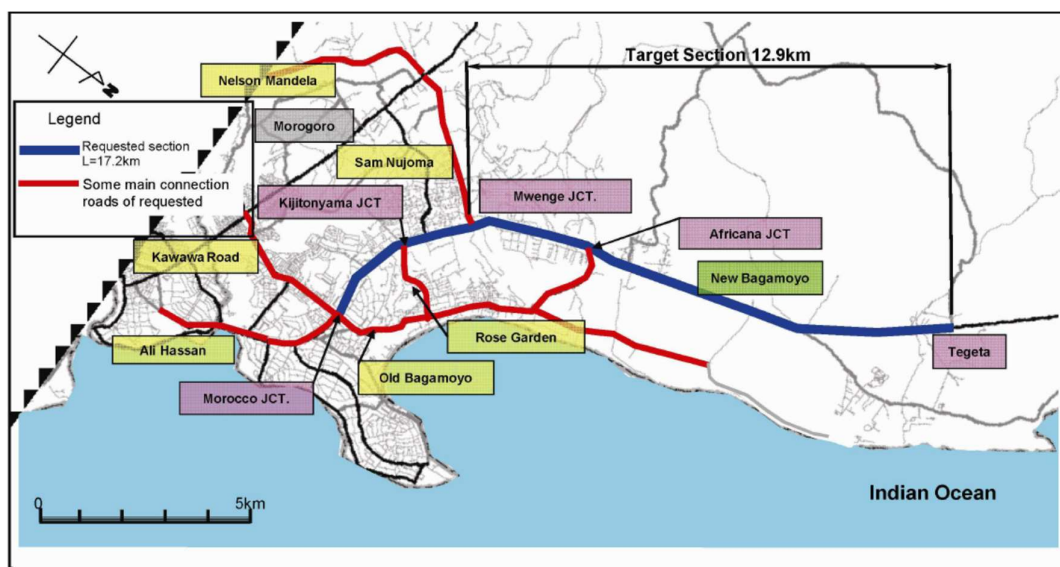


Road Improved by the Project

### 1.1. Background

As demand for urban traffic expanded dramatically in response to the recovery of the Tanzanian economy, road traffic volume in the Dar es Salaam metropolitan area increased rapidly in the 2000s. In the meanwhile, traffic congestion significantly deteriorated on the major trunk roads of Morogoro Road, Nyerere Road, Kilwa Road, and New Bagamoyo Road due to the uncoordinated development and the concentration of traffic in urban areas. In particular, New Bagamoyo Road, the target road of this project, was the only major trunk road in Dar es Salaam that had not been widened to a four-lane at the time of planning, and thus its traffic congestion during peak hours in the morning and evening was severe. Therefore, mitigating traffic congestion through the widening of the road was a pressing issue.

Against this background, the Government of Tanzania made a request for grant aid on this project in August 2004, and after reviewing the target section of the road, submitted a new request to the Government of Japan in August 2007. In the meanwhile, the Transport Policy and System Development Master Plan study (April 2007–June 2008) recommended an about 17-km section of the New Bagamoyo Road from Morocco intersection to Tegeta intersection as a priority project to be undertaken by 2015, and thus a preparatory survey was conducted for this section. However, a further survey was judged to be necessary to fix the exact road alignment because of the existence of underground structures, etc. on the section of 4.3km between Morocco intersection and Mwenge intersection. Finally, the target section of this project had been determined to be the 12.9-km section from Mwenge intersection to Tegeta intersection (see Figure 1).



Source: Preparatory Survey Report

Figure 1. Target Section of the Project for Widening of New Bagamoyo Road

## 1.2. Project Outline

The objective of this project is to ensure smooth and steady traffic on the New Bagamoyo Road in Dar es Salaam by widening its 12.9-km target section between the Mwenge and Tegeta intersections, thereby contributing to the improvement of urban transport mobility and a reduction in the transportation cost of trade goods such as agricultural produce.

Grant Limit / Actual Grant Amount	D/D: 60 million yen / 59 million yen Main Work: 5,095 million yen (Additional GA: including 222 million yen) / 5,060 million yen
Exchange of Notes Date / Grant Agreement Date	D/D: February 2010 / February 2010 Main Work: May 2010 / May 2010 Additional GA: January 2014 / January 2014
Executing Agency	Tanzania National Roads Agency (TANROADS)
Project Completion	July 2014
Main Contractor	Konoike Construction Co., Ltd.
Main Consultant	INGÉROSEC Corporation
Basic Design	March 2009–October 2009
Related Projects	Technical Cooperation Projects: <ul style="list-style-type: none"> <li>• Study of Dar es Salaam Road Development Plan (1995)</li> <li>• Study of Dar es Salaam Transport Policy and System Development Master Plan (2007–2008)</li> </ul> Grant Aid Projects: <ul style="list-style-type: none"> <li>• Salender Bridge Widening Project (1980)</li> <li>• Morogoro Road Improvement Project (1984–1985)</li> <li>• Project for the Improvement of the Road Network in the Metropolitan Area (1991–1995)</li> <li>• Project for the Improvement of Road Repair Equipment (1993, 1995)</li> </ul>

	<ul style="list-style-type: none"> <li>• Project for the Bridge Improvement on Trunk Roads (1996–1998)</li> <li>• Dar es Salaam Road Improvement Project (1997–1999)</li> <li>• Project for Widening of Kilwa Road (2004–2009)</li> </ul> <p>Other International Organizations and Aid Organizations, etc.:</p> <ul style="list-style-type: none"> <li>• World Bank “Integrated Roads Project I, II” (1990, 1994) (Loan)</li> <li>• European Development Fund (EDF) “Nelson Mandela Road Project” (2003–2009) (Grant aid)</li> <li>• European Union (EU) “Backlog Maintenance Programme for the Central Corridor” (2006) (Grant aid)</li> <li>• Danish International Development Agency (DANIDA) “Dar-Mlandizi Road Project” (1997) (Grant aid)</li> <li>• Kuwait Fund / Organization of the Petroleum Exporting Countries (OPEC) / Saudi Fund/Government of Tanzania “Mkuranga-Kibiti Road Project” (2001) (Loan)</li> </ul>
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## 2. Outline of the Evaluation Study

### 2. 1. External Evaluator

Tomoyuki Sho, IC Net Limited

### 2. 2. Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: November 2017 – December 2018

Duration of the Field Study: March 10 – 28, 2018; July 1 – 11, 2018

### 2. 3. Constraints during the Evaluation Study

Having considered that this project was to widen New Bagamoyo Road, one of the major trunk roads in Dar es Salaam, into four lanes (two lanes in each direction) for the section between Mwenge and Tegeta, the direct and indirect beneficiary effects had been expected on the entire population of Dar es Salaam (about three million) at the time of planning. Yet, the second-round impact of a project on a trunk road like this one, which constitutes a part of the vital road network, would be strongly influenced by its connectivity to other roads, which are out of the scope of the project. In addition, it would be affected by other non-road factors (economic trends, policies, etc.) and thus it must be extremely difficult to assess the net effect of this project alone on the vast target beneficiary areas, while separating it from the impacts of the other non-project factors. Consequently, this evaluation focused primarily on the areas along and near New Bagamoyo Road where the direct effects of the project can be expected. For the second-round impact such as the effects on the residents' economic activities and on the local commercial development, the causality cannot be easily determined in a quantitative manner in a study of a limited scope like this one. Thus, this evaluation has relied heavily on the analysis of qualitative information collected from site visits and face-to-face interviews with local residents, transportation companies, shop owners, and others.

### 3. Results of the Evaluation (Overall Rating: B<sup>1</sup>)

#### 3. 1. Relevance (Rating: ③<sup>2</sup>)

##### 3. 1. 1. Consistency with the Development Plan of Tanzania

Tanzania's national development policy documents at the times of planning and ex-post evaluation, the *National Strategy for Growth and Reduction of Poverty* (NSGRP) (formulated in 2005) and the *Second Five Year Development Plan* (FYDP II) (formulated in 2016), both point to the expansion of infrastructure projects related to road network construction as a primary objective for the promotion of the growth of the economy and development across regions. Particularly, improving mobility and alleviating congestion through the improvement of urban transportation networks was listed as a priority. In addition, the country's development strategy document for the transport sector *10 Year Transport Sector Investment Program* (TSIP) (formulated in 2008) gives top priority to the expansion and modernization of trunk roads in Dar es Salaam for the purposes of promoting economic and social activities and improving the well-being of the people, and mentions the New Bagamoyo Road project. The *Five-Year Strategic Plan* of the Tanzania National Roads Agency (hereinafter referred to as "TANROADS") has also consistently mentioned that improving the trunk roads in Dar es Salaam including New Bagamoyo Road is a priority, and the latest *5th Five-Year Strategic Plan* (formulated in 2018) lists the improvement of the road section between Mwenge and Morocco as one of the priority projects.

In light of the above, the project is highly relevant to the development policy and road sector policy of Tanzania.

##### 3. 1. 2. Consistency with the Development Needs of Tanzania

The population of Dar es Salaam is about 4.36 million (2012 census)<sup>3</sup>, of which about 1.78 million live in Kinondoni Municipality where New Bagamoyo Road runs through. Most households in Kinondoni are in the middle class and many own private vehicles<sup>4</sup>, and the traffic volume of New Bagamoyo Road has increased dramatically along with a rapid population growth (64% up from the 2002 census). Yet, New Bagamoyo Road was the only one among the four major trunk roads in Dar es Salaam that had not been widened to a four-lane at the time of planning, and thus chronic traffic congestion had become being caused. Particularly, due to severe congestion caused by low-speed vehicles and damaged road surface, it had become to take two to three hours during peak commuting hours in the morning and evening to drive from Tegeta intersection, the terminal point of the target road section, to the center of the city for a distance of about dozen kilometers.

Even at the time of ex-post evaluation, traffic volume has been increasing as a result of the accelerated development of residential land and the construction of commercial facilities along and near the road after completion of the project. According to the traffic count surveys conducted near Mwenge intersection, the

<sup>1</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>2</sup> ③: High, ②: Fair, ①: Low

<sup>3</sup> The 2016 population estimate of Dar es Salaam is approximately 5.47 million.

<sup>4</sup> The number of private vehicles owned per 1,000 residents in Kinondoni at the time of planning was 46.0, which was slightly higher than an average of 42.6 for Dar es Salaam as a whole (Source: UITP/UATP, *Report on Statistical Indicators of Public Transport Performance*, 2010).

starting point of the target road section, in 2008 and 2017<sup>5</sup>, the number of passing vehicles sharply increased more than 2.3 times in nine years at an annualized rate of 9.9%. Therefore, there continues to be strong needs for the improvement of New Bagamoyo Road, as demonstrated by the decision to carry out the improvement of the 4.3-km road section between Mwenge and Morocco, as the second phase of the project, which had not been included in the target 12.9-km section of this project<sup>6</sup>.

Expecting the extension of Bus Rapid Transit (hereinafter referred to as “BRT”) lanes into the project road section in the future, reserved spaces for BRT lanes have been set aside in the median strip in this project. No specific problems have been found in terms of the cooperation and division of roles with the Government of Tanzania, the African Development Bank (AfDB), and the World Bank, of which the latter two have played key roles in BRT. At the time of ex-post evaluation, BRT is scheduled to be introduced into New Bagamoyo Road by December 2023 as part of the fourth phase of the BRT construction project.

In light of the above, the project is consistent with the development needs of Tanzania.

### 3. 1. 3. Consistency with Japan’s ODA Policy

At the time of planning, the *Country Assistance Program for the United Republic of Tanzania* (2008) stated the Government of Japan would assist in the infrastructure development, which is the foundation of economic growth, and continue to place high priority on assistance in the transport sector such as road, in which Japan has a technological comparative advantage. Also, its Priority and Sectoral ODA Policies section mentioned that the government would consider providing an aid in the road sector so that Dar es Salaam, the nation’s de facto capital, would be able to fulfill its functions adequately.

Thus, the consistency between the Project and Japan’s ODA policy is high.

In light of the above, this project is highly relevant to Tanzania’s development policy and development needs, as well as Japan’s ODA policy. Therefore, its relevance is high.

## 3. 2. Efficiency (Rating:②)

### 3. 2. 1. Project Outputs

Table 1 shows the actual outputs of this project. Apart from eight design changes, the outputs have been constructed and procured as planned. The design changes had been done appropriately in order to accommodate requests for improvement by the Tanzanian side to adjust to the situations on the ground, or to comply with the local standards. And it is confirmed that they were all reasonable.

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<sup>5</sup> Source: Eight-Japan Engineering Consultants Inc.

<sup>6</sup> A grant agreement has been concluded in February 2018. From January to July 2016, the Tanzanian side provisionally improved the section between Mwenge and Morocco and plainly expanded it into four-lanes with a cost of approximately five billion shillings.

Table 1. A Summary of the Actual Facilities Constructed

Item		Description
Target Section		12.9 km (Sta. 4.3 km – Sta. 17.2 km)
Road Paving Work	Surface Course	Asphalt concrete 5 cm (carriageway) or 3 cm (footpath)
	Binder Course	Asphalt concrete 5 cm
	Base Course	Base course 10 cm (asphalt stabilized: DBM)
		Sub-base course: 12.5 cm – 33 cm (cement stabilized)
	Protective Shoulder	Cement stabilization + bitumen sealing
Underground Drainage Work		Sta. 8.2 km – Sta. 9.5 km subsoil drain
Width		Carriageways 7.5 m x 2; BRT central reservation 9.0 m; footpaths 1.5 m
Bridge Work	Mlalakuwa Bridge	PC-T girder bridge (post tension); 30 m long with pile foundations
	Lugalo Bridge	PC-T girder bridge (post tension); 30 m long with spread foundations
	Tegeta Bridge	PC-T girder bridge (post tension); 30 m long with pile foundations and spread foundations
Road Drainage Work		<ul style="list-style-type: none"> <li>• Concrete block open drains: newly constructed along the entire route</li> <li>• Road crossing culvert: 28 locations (box culvert of 900 mm x 900 mm or other specifications)</li> <li>• U-shaped side drain: 400 mm x 300 mm at cut sections, etc.</li> <li>• Inlet/outlet: 52 locations</li> <li>• Catch basin: 43 locations</li> </ul>
Auxiliary Road Structures		<ul style="list-style-type: none"> <li>• Kerbstone work</li> <li>• Road markings</li> <li>• Guard rails</li> <li>• Road signs</li> <li>• Bus bays</li> </ul>

Sources: Materials provided by JICA, site visits, face-to-face interviews and questionnaire surveys

The defect liability period of this project for road pavement was set to be for three years after completion of the project (August 2014 - July 2017) because some defects such as ruts and waves had been found at the early stages after completion. The places where those defects had been found during the defect liability period were appropriately repaired based on the agreement between the Tanzanian side and the Japanese side. Although some waves were spotted in parts of the road even at the time of ex-post evaluation, it has been caused by a dispersion in the quality of asphalt mixture production, according to the construction consultant. And its design specifications including pavement structure and its total thickness were as good as or better than those of Sam Nujoma Road (completed in 2008) and Nelson Mandela Road (completed in 2012) in Dar es Salaam, where the improvement plans were being developed almost concurrently.

With regard to auxiliary road structures, bus stops were constructed in a total of 38 locations on both sides of the road<sup>7</sup>, and protective fences (guardrails) were installed on one side in the direction from Mwenge intersection toward Tegeta in the section between Km 6.3–Km 6.4, and on the other side in the direction from Tegeta intersection toward Mwenge in the section between Km 10.5–Km 10.6. As for traffic signs, a total of about 90 were confirmed to have been installed at the both sides of the road. Due to budgetary constraints,

<sup>7</sup> During heavy rain in February 2018, the roof of a bus stop next to Mwenge intersection collapsed with its support pillars into side ditches, and it got subsequently removed.

street lamps became out of the scope of this project, and no street lamps have been installed even at the time of ex-post evaluation<sup>8</sup>. The Tanzanian side has completed the installment of traffic lights (out of the scope of the project) at six locations with a cost of 1.3 billion Tanzanian shillings in June 2017.

### 3.2.2. Project Inputs

#### 3.2.2.1. Project Cost

Because data on the actual project cost borne by the Tanzanian side could not be obtained<sup>9</sup>, the efficiency related to the project cost has been evaluated using the cost borne by the Japanese side only. When comparing the planned cost with the actual cost, the actual project cost borne by the Japanese side exceeds the planned cost by about 4% (see Table 2). The reason is that the volume of poor-quality soil that needed replacing turned out to be unexpectedly high because much of the land for road construction had been privately-owned and could not be entered for conducting soil surveys during the preparatory survey period<sup>10</sup>. Consequently, given that the construction contractor could not continue its construction work with a budget shortfall, an additional grant agreement of 222 million yen was signed in January 2014. In short, the actual project cost exceeded the planned cost.

Table 2. Planned and Actual Project Costs

	Plan	Actual	(Unit: million yen) As Percentage of the Plan (%)
Total Project Cost	5,451	--	--
Cost borne by Japanese side	4,933	5,119	103.8
(Main Work)	4,873	5,060	103.8
Construction cost	--	4,896	--
Design and supervision cost	--	164	--
(Detailed Design)	60	59	98.3
Cost borne by Tanzanian side	518	--	--

Source: Materials provided by JICA

#### 3.2.2.2. Project Period

As shown in Table 3, the actual project period exceeded the planned period by eleven months (29%). The

<sup>8</sup> The installation work of street lamps by TANROADS has been interrupted due to technical difficulties at the time of ex-post evaluation. TANROADS officials attribute the difficulties the construction work has faced to the narrow strip reserved between the sidewalk and the side ditches, which are not wide enough for installing street lamps, and believe that the basic design had not adequately taken into account the installation of street lamps.

<sup>9</sup> According to interviews with the officials, the items to be borne by Tanzania side (1. Cost of relocating existing buildings; 2. Cost of relocating underground water pipes; 3. Cost of relocating telephone lines and poles; 4. Cost of relocating electricity lines and utility poles; 5. Cost of transplanting roadside trees; 6. Cost of registering construction companies; and 7. Bank commissions) had been carried out as planned, and the total cost borne by the Tanzanian side amounted to more than 12 billion shillings. However, the figure has not been corroborated with data.

<sup>10</sup> Some might regard the project cost overrun caused by the increased volume of poor-quality soil that needed replacing is due to an unforeseeable external factor. However, it does not fall in the category of external factors specified in JICA's References for External Ex-Post Evaluation, such as "extraordinary natural catastrophe, warfare, or temporary evacuation due to security problems." It does not contribute to an increase in output, either. Therefore, when evaluating efficiency, this evaluation does not add the amount of the additional grant agreement, which became necessary for the increased volume of poor-quality soil that needed replacing, to the planned project cost.



reason is that the construction periods had been extended three times due to record rainfalls in December 2011 and in April 2014, although there was no delay at the detailed design stage. More specifically, because the torrential rainfall had caused partial road flooding, landslides, the collapse of a retaining wall of a bridge, it became necessary to review and revise the design before restoring damages and resuming the remaining construction work. And this delayed the construction. In light of the above, the project period exceeded the plan.

Table 3. Planned and Actual Project Periods

Plan		Actual		As Percentage of the Plan
February 2010 (signing of D/D contract <sup>11</sup> ) – March 2013 (completion)	38 months	July 2010 (signing of D/D contract) – July 2014 (completion)	49 months	+11 months 128.9%

Source: Materials provided by JICA

In short, both the project cost and project period exceeded the plan. Thus, efficiency of the project is fair.

### 3. 3. Effectiveness and Impacts<sup>12</sup> (Rating:③)

#### 3. 3. 1. Effectiveness

##### 3. 3. 1. 1. Quantitative Effects (Operation and Effect Indicators)

At the time of planning, the average traffic speed of vehicles and the traffic capacity were selected as quantitative indicators for effectiveness. Through the implementation of this project, the average traffic speed during the peak commuting hours in the morning and evening was expected to improve dramatically from 6.5 km/h to 42 km/h, whereas the traffic capacity was expected to increase from 825 vehicles/hr/lane to 1,740 vehicles/hr/lane (see Table 4).

Table 4. Effect Indicators: Average Traffic Speed during Peak Hours and Traffic Capacity

(Unit: km/h)

Effect Indicator	Baseline	Target	Actual
	2009	2013	2017
	At the time of planning	At the time of project completion	At the time of ex-post evaluation
Average traffic speed (km/h during the peak commuting hours)	6.5	42	29.7
Traffic capacity (vehicles/hr/lane)	825	1,740	(1,740)

Sources: Materials provided by JICA, site visits

Note: The actual average traffic speed was measured by the evaluator.

<sup>11</sup> The Ex-Ante Project Evaluation Report and the work implementation schedule of the Preparatory Survey Report both indicate the planned period of 38 months, but the Ex-Ante Project Evaluation Report is not clear about the starting point. Since the work implementation schedule does not include the period between the exchange of notes (E/N) to the signing of D/D contract, this evaluation has assumed that the planned period was 38 months by making the starting point for evaluation the signing of D/D contract and counting both months at the start and end of the period. The construction completion date is regarded as the completion of the project.

<sup>12</sup> Sub-rating for Effectiveness is to be made with consideration of Impact.

The actual data on the indicator "Average traffic speed" had not been collected immediately after completion of the project. Therefore, the evaluator measured the average traffic speed at the time of ex-post evaluation by following the traffic flow between the starting and terminal points at a normal speed (in the morning and evening peak hours of weekdays in each direction). As a result, the average traffic speed turned out to be approximately 30km/h at the time of ex-post evaluation, which is a dramatic improvement over the baseline value measured at the time of planning but still short of the target for the time of project completion<sup>13</sup>. Nevertheless, given the following factors, it is considered that a possibility that the target has been achieved at the time of project completion is sufficiently high.

- Population Growth in the Areas along and near the Road: The areas along and near New Bagamoyo Road (such as Madale, Mabwepaude, Mbweni<sup>14</sup>) have witnessed a rapid population growth since right after the completion of the project in 2014, owing to large-scale residential land developments that have taken place to the north of Tegeta junction and elsewhere<sup>15</sup>. As a result, traffic volumes along the road has also increased dramatically, as demonstrated by the results of the above-mentioned traffic count surveys conducted near Mwenge intersection.
- Increased Traffic Flow via Msata Road: In March 2017, a project to pave and improve Msata Road that runs between Msata and Bagamoyo (64km) had been completed<sup>16</sup>, and the Northern Region (such as Arusha and Tanga) and Dar es Salaam have become connected by way of New Bagamoyo Road. Consequently, large cargo trucks and long-distance buses, which used to go through Morogoro Road, have become to use New Bagamoyo Road, and traffic volume has significantly increased.

As mentioned, a comparison of the traffic count surveys conducted near Mwenge intersection in 2008 and in January 2017 indicates that the number of travelling vehicles had sharply increased more than 2.3 times in nine years at an annualized rate of 9.9% (see Table 5). In reality, an increase in traffic volume has been accelerated since the completion of the project in July 2014. Also, the number of large buses and trucks has gone up since the improvement of Msata Road was completed, which took place after the traffic count surveys. Therefore, the pace of an increase in traffic volume along New Bagamoyo Road for the period between project completion and ex-post evaluation must have been even more dramatic than that estimated from the data presented in Table 5.

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<sup>13</sup> In a total of 28 measurements, the maximum average speed was 43.7 km/h, the minimum 18.0 km/h, and the standard deviation 7.8 km/h. The target average speed was met four times out of the 28 (approximately 14%).

<sup>14</sup> In Mbweni, 20,000 housing units have been developed, according to local road consultants.

<sup>15</sup> However, data on population estimate for a year after the 2012 decennial census could not be obtained.

<sup>16</sup> It cost approximately 126 billion shillings.

Table 5. Road Traffic Count Surveys: 2008 and 2017

(Unit: number of vehicles)

Survey Location: Near Mwenge Intersection													
Date	Type of Vehicle												Total
	Passenger Car	Taxi	Pick-up & Van	Microbus (Dala-dala)	Medium Bus (Dala-dala)	Large Bus	Group Bus	2-axle Truck (Light Truck)	3-axle Truck (Dump Truck)	Heavy Truck	Motor-cycle / Bajaj	Bicycle, Pushcart, etc	
2008	5,667	824	2,374	2,696	781	717	287	852	409	168	535	712	16,022
January 2017	19,704	247	1,325	311	4,727	2	365	1,205	1,055	548	7,428	477	37,394

Source: Eight-Japan Engineering Consultants Inc.

Note: Length of the surveys is for 14 hours per day from 6 a.m. to 8 p.m.

- Stories Told by Road Users: According to face-to-face interviews with the road-side residents who have been using New Bagamoyo Road and those who work for business and transportation companies<sup>17</sup>, traffic speed had dramatically improved in the first year after completion of the project. In the following years, however, these gains obtained from the alleviation of traffic congestion have been gradually lost due to the traffic volume increases.
- Installment of Speed Humps: Speed humps (traffic calming devices) were installed by TANROADS at six locations on the road (near the Lugalo barracks) as safety measures, and thus the traffic speed of vehicles has been reduced.
- Speed Limit near a Construction Site: The construction of a pedestrian overpass has been in progress at the point of Km 3.5 in the direction from Mwenge intersection toward Tegeta at the time of ex-post evaluation, and the traffic speed around the site has been limited to 30km/h.

Considering these points, in addition to the views expressed by TANROADS officials and local road consultants, it seems reasonable to assume that the likelihood is high for the target of the average traffic speed during the peak hours being achieved right after completion of the project in 2014.

The indicator “Traffic capacity” is not an empirical indicator to be measured but rather to be estimated from parameters such as the number of lanes, the specifications of road shoulders, and the ratio of large-sized vehicles. Its value had been calculated based on the road design. Because the outputs of this project were produced virtually as planned, the target of the traffic capacity must have been achieved at the same time as project completion.

<sup>17</sup> The total number of target road-side residents and shop owners responding to the qualitative surveys was 51, of which 18 were interviewed around Mwenge and 33 around Tegeta. Thirty-four were males and 17 were females, and by age group, three persons were in their 10's, 10 persons were in the 20's, 13 persons in their 30's, 17 persons in their 40's, five persons were in their 50's, and three persons in their 60's. Among them, 24 were shop owners and eight were professional drivers. Others were four students, three government workers, two housewives, etc. The total number of those targets who work for business and transportation companies responding to the qualitative surveys was 15, of which 12 were managers of transport and business (such as iron works, gasoline sales, beverage manufacturing and bottling, cement, chemistry/cosmetics, poultry products processing, dairy products processing) companies, two were employees, and one was truck driver. The average number of employees of the transport/business companies is 226 (minimum 22 persons, maximum 700 persons).

This evaluation selected the “Driving time” as an additional quantitative indicator for measuring project effects, and its data were collected at the same time when the average traffic speed during peak hours was measured. Since the average traffic speed is obtained by dividing the distance of the target road section by the driving time, it is possible to say that both the travel time and the average traffic speed measure the same phenomenon from different points of view. The baseline and target values of the driving time were calculated by dividing the distance of the target road section by the baseline and target values of the average traffic speed, respectively. Table 6 shows that the driving time between Mwenge and Tegeta at the time of ex-post evaluation has been reduced to a quarter of the level of the time of planning by more than an hour and a half.

Table 6. Additional Effect Indicator: Driving Time during Peak Hours

(Unit: minute)

Indicator	Baseline (2009)	Target (2013) At the year of project completion	Actual (2018) At the year of ex-post evaluation
Driving Time	119	18.4	28

Sources: Materials provided by JICA, site visits

Note: The traffic speed was measured and calculated by the evaluator.

### 3.3.1.2. Qualitative Effects (Other Effects)

At the time of planning, the three indicators had been selected as qualitative indicators for the indirect effects of this project, of which the following indicator is considered to be related to the effectiveness.

- Widening the road to a two-lane road in each direction will ensure smooth traffic by separating vehicles travelling at normal speed from those at slower speed.

Through the site visits and face-to-face interviews, it is confirmed that the target of this indicator has been mostly achieved, although, at the time of ex-post evaluation, there are some sections where the separation of normal-speed vehicles and slower-speed ones has become less clear during the peak hours due to increased traffic volume. Owing to the widening of the road into two lanes on each direction, as well as the installments of a median strip and traffic signs, many road users have felt that safety has also been improved<sup>18</sup>. Yet, some road users are concerned about the safety of driving at night because no street lamps have been installed.

### 3.3.2. Impacts

#### 3.3.2.1. Intended Impacts

Among the qualitative indicators chosen at the time of planning for measuring the indirect effects of this project, the following two indicators are considered to be related to the impacts.

- Shorter driving time will contribute to a reduction in the transportation cost of trade goods such as

<sup>18</sup> The number of road traffic deaths in Kinondoni Municipality, where New Bagamoyo Road runs through, dropped (52%) from 242 deaths in 2014 to 117 deaths in 2015. The number of road traffic deaths in the rest of Dar es Salaam excluding Kinondoni decreased (22%) from 264 deaths to 205 deaths during the same period.

agricultural products.

- The enhanced traffic capacity of the road, along with the operationalization of the BRT services, will improve the urban transport mobility of the general public in Dar es Salaam<sup>19</sup>.

This evaluation has assessed the extent to which the outcomes of these impacts have been accomplished mainly through face-to-face interviews with those who work for transportation and business companies, which have been using New Bagamoyo Road, as well as interviews and group discussions with road-side residents and shop owners, and site visits.

#### (1) Reduction in Transportation Cost

Many of the users of New Bagamoyo Road responded to the interview surveys that as road traffic became smooth and travel time became shorter, the transportation cost has been decreased through saving the cost on gasoline. (However, the prices of trade goods, such as agricultural produce, were not recognized to have been decreased<sup>20</sup>.)

#### (2) Improvement of Urban Transport Mobility

Prior to the project, the numbers of bus routes and operating buses for passenger buses (dala-dala) had been limited compared to other major trunk roads of Morogoro Road, Nyerere Road, and Kilwa Road<sup>21</sup>. But after completion of the project, the situation has improved. In addition, the size of passenger buses has become larger and travel time has become shorter than before the project implementation as traffic congestion was eased. Therefore, the level of comfort has also been enhanced. (Table 5 also confirms that minibuses have been being replaced by medium buses<sup>22</sup>.) Moreover, access to hospitals, banks, and supermarkets has become much easier than before, and the residents' level of satisfaction has increased. In the meanwhile, the passenger bus fare has not been raised. Thus, the perceived affordability of the bus services should have risen compared to before.

### 3.3.2.2. Other Positive and Negative Impacts

#### (1) Impacts on the Natural Environment

No sustainable negative impact has been occurred on the natural environment as a result of this project<sup>23</sup>.

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<sup>19</sup> As mentioned, BRT is planned to be introduced into New Bagamoyo Road by December 2023 as part of the fourth phase of the BRT construction project. It is expected that the convenience of the public transportation system will be further improved with the operation of BRT, which will get constructed on the foundation of this project's outcomes.

<sup>20</sup> On the other hand, many residents responded that more varieties of agricultural produce have become available for purchase compared to before.

<sup>21</sup> Source: Kyong Dong Engineering Co., Ltd., *Traffic Survey and Demand Forecasting Report* (2017).

<sup>22</sup> Table 5 indicates that the number of large buses travelling had dropped. However, since the upgraded Msata Road went open immediately after the traffic count survey, the number of large buses is believed to have increased as well. During the site visits at the time of ex-post evaluation, a large number of large intercity buses travelling toward the Tegeta intersection via the Bagamoyo intersection on Msata Road were witnessed.

<sup>23</sup> This project is classified as Category B in its impact on the environment (applying *JICA Guidelines for Environmental and Social Considerations* (2004)).

The Environmental Impact Assessment (EIA) report was approved in January 2010. It was confirmed through the face-to-face interviews and questionnaire surveys with the officials of the executing agency that appropriate actions on traffic controls, noise, vibration, and such, had been taken during the construction period in accordance with the mitigation measures and that their monitoring had been carried out as planned. However, no documents/data on the EIA of the project were provided from TANROADS.

## (2) Resettlement and Land Acquisition

The Resettlement Action Plan (RAP) of the project had been formulated in accordance with the Tanzanian land management laws, and the land acquisition and resettlement had been carried out as planned. Two households became subject to resettlement, and a compensation of 19.3 million shillings was paid in total. Also, water catchment facilities of Dar es Salaam Water and Sewerage Authority (DAWASA) were demolished according to the plan and a compensation was made. No specific complaints, and such, have been received from residents.

## (3) Fueling Local Economic Activity

The upgrading of the road has triggered the openings of large commercial facilities especially in the areas near Tegeta intersection and Gwaba intersection, as well as large-scale residential land and housing development along and near the road. The constructions of several modern buildings are under way at the time of ex-post evaluation. The interviews with roadside residents and shop owners also confirmed that new hospitals, supermarkets, etc. have been being opened, and businesses by local residents have become more active. Many of the youth, in particular, have started the manufacturing and sales of blocks and beds, carpentry work, sales of food/fruits/drinking water, services of three-wheeled bike (bajaj) and bike taxis, etc. Although various factors other than the upgrading of the road must have affected the development of the local economy, the development of the areas along and near the road must have progressed much more slowly than what has happened if this project had not been implemented.



Photo 1. Modern Buildings under Construction along the Road



Photo 2. Street Vendors along the Road

#### (4) Unexpected Negative Impact

After completion of this project, road flooding during the rainy season has become worse in some sections such as Africana intersection<sup>24</sup>. Moreover, surface ponding due to drainage water from the road has become widespread in some areas, and residents have had difficulty in handling the issue in their daily lives. Many residents and shop owners expressed their frustration at the drainage water from the road during the site visits and the interviews. It is considered that the fundamental causes of the problem include the disorderly development of residential land and deforestation in the upstream areas of the road, as well as the municipal drainage connections that have not taken into account how much volume of flow they can handle. Still, the road drainage facilities constructed by the project, such as road crossing culverts and side ditches, have turned out to be not fully capable of managing flow volume during the rainy season, and this has also affected the issue in the end.

In this project, the side roads and the installation of auxiliary ditches just outside the roads, which had been proposed by the construction consultant, had become out of the scope due to budget constraints. Besides, the rehabilitations of a sediment basin at the upstream of the road and the existing drainage facilities had become out of the scope of the project for budgetary reasons as well. It appears that the plan should have been formulated by carefully taking into account components other than the main road, such as road drainage facilities, and a necessary budget for it should have been secured.

To summarize effectiveness and impact, the average traffic speed during peak hours at the time of ex-post evaluation turned out to be approximately 30 km/h, which fell short of the target speed of 42 km/h in the project completion year, with regard to effectiveness. However, since the completion of the project, large-scale residential land developments, and such, have been carried out in the areas along and near the road, and subsequently rapid population growth and a dramatic increase in traffic volume have taken place. In addition, the pavement improvement of the Msata road that runs between the Msata and Bagamoyo intersections was completed in March 2017, and thus the Northern Region and Dar es Salaam became connected through New Bagamoyo Road. Consequently, a large number of big cargo trucks and long-distance buses, which used to go through Morogoro Road, began using New Bagamoyo Road, and traffic volume has substantially increased. Taking these factors into consideration, it is highly likely that the target of the average traffic speed during the peak hours had been being achieved right after the completion of the project in 2014. Also, the target of the traffic capacity has been achieved at once when the project was completed as the output of the project was produced according to the plan. Furthermore, ensuring smooth and steady traffic through the separation of vehicles travelling at normal speed from those at slower speed has been mostly achieved.

Regarding impact, ensuring of smooth and steady traffic and shortening of travel time must have contributed to a reduction in transportation cost to a certain extent by saving gas expenses. Also, urban transport mobility has been enhanced through a large increase in the number of passenger bus services running

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<sup>24</sup> At the time of ex-post evaluation, the rehabilitation and improvement of a road connecting to Africana intersection (approximately one kilometer long) is being carried out by TANROADS.

on New Bagamoyo Road after the completion of the project. Moreover, robust large-scale residential land development and commercial development have been brought in along and near the road, and growth in local economic activity and employment opportunities was observed.

In light of the above, the effectiveness and impact of the project are high.

### 3. 4. Sustainability (Rating: ②)

#### 3. 4. 1. Institutional / Organizational Aspect of Operation and Maintenance

TANROADS, the executing agency of the project, was established in July 2000 and has jurisdiction over the development, maintenance, and management of the road networks under the auspices of the Ministry of Works, Transport and Communications (hereinafter referred to as "MWTC"). TANROADS has the board of directors which is comprised of 9 directors, including the chief executive officer who serves as the secretary to the board of directors. As shown in Table 7, the number of regular employees at TANROADS at the time of ex-post evaluation is 748 (2,257 including contract employees), and it has decreased by about 5% from 791 since the time of planning. Over the year, the number of employees has decreased by 38, as new hiring has been limited. However, TANROADS has been planning to push through a major reorganization after June 2018 and its preparation is under way<sup>25</sup>. Nearly 200 new employees are planned to be hired accordingly<sup>26</sup>. In light of the above, no specific problem has been found on the institutional aspect of operation and maintenance.

Table 7. Number of TANROADS Employees

(Unit: persons)

Department	2007 (at the time of planning)	2017	2018 (at the time of ex-post evaluation)
Maintenance	--	621	585
Business Support	--	61	57
Procurement & Contracts	--	9	8
Planning	--	53	59
Projects	--	21	18
Internal Audit	--	14	21
Legal Services	--	7	
Total	791	786	748

Source: TANROADS data

#### 3. 4. 2. Technical Aspect of Operation and Maintenance

Through interviews with stakeholders including the construction consultant, and local road consultants, no specific problem has been confirmed about the technical levels of either TANROADS, its Dar es Salaam Regional Manager's Office, or the outsourced subcontractors. Even at the time of ex-post evaluation, the upgrading of a road (including side ditches) connecting to Africana intersection is being carried out, and thus

<sup>25</sup> The reorganization is planned mainly because the maintenance and management of airport facilities become under the jurisdiction of TANROADS.

<sup>26</sup> The reorganization is expected to be implemented as soon as approval from the Present's Office is obtained.



the road constructed by this project has been being further improved. Moreover, a large-scale maintenance and expansion work is underway at the section between Bagamoyo intersection and Bunju, which is a part of the road between Bagamoyo and Tegeta intersections (approximately 41 km) that joins Msata Road and New Bagamoyo Road. Thus, maintenance and expansion of the road network that further enhances the function of the target section of this project has been in progress, and it is considered to show that TANROADS has adequate maintenance skills. On a side note, almost all TANROADS engineers have university degrees in the fields such as civil engineering, road engineering, transportation engineering, and so on. In light of the above, there were no specific problems about the technical aspect of operation and maintenance.

### 3.4.3. Financial Aspect of Operation and Maintenance

TANROADS relies heavily on the Road Funds and the Development Funds for its revenues. The Development Funds are financed by the Consolidated Funds of the Ministry of Finance, which are allocated to TANROADS through MWTC<sup>27</sup>. The Road Funds, on the other hand, are mainly financed by gasoline tax and overload charges, and 63% of the collected amount is allocated to TANROADS, 30% to municipalities, and 7% to MWTC.

As for the initial TANROADS budget for 2016/2017, both revenue and expenditure increased significantly from the previous year, as shown in Table 8. Yet, the actual total revenue turned out to be about 17% below the previous year's level because revenue from the Development Funds dropped significantly relative to the budget. Still, the actual expenditure increased about 47% and the maintenance management expenses/management construction costs rose about 2.8 times over the previous year. As a result, the balances for both the initial budget and the actual amount were in large deficits. According to TANROADS officials, however, its budget is managed through the medium-term expenditure framework (MTEF) and any amount of deficit will be financed next year through grant revenue (Development Funds) under this mechanism. Therefore, there is no concern about the financial stability of TANROADS at all.

Table 8. Changes in TANROADS Budget and Actual Amounts over Time

(Unit: million Tanzanian shillings)

	Item	2013/2014		2014/2015		2015/2016		2016/2017	
		Initial Budget	Actual	Initial Budget	Actual	Initial Budget	Actual	Initial Budget	Actual
Revenue	Road Funds Board	314,536	315,010	469,495	191,369	541,281	454,676	519,870	451,016
	Development Funds	-	-	-	-	251,653	767,979	1,222,116	527,898
	MWTC Consolidated Funds (Personal Emolument)	9,384	10,767	10,925	11,595	15,912	16,117	16,289	15,377
	Direct Donor Fund	4,500	1,245	-	-	-	-	-	83
	Finance Income	950	950	900	413	391	709	42,961	32,864

<sup>27</sup> In audited financial statements, the Development Funds and the Development Expenses have been treated as independent items since 2015/2016.

	Other	9,060	9,060	5,760	9,844	4,271	14,977	2,662	17,159
	Total	338,430	337,032	487,080	213,221	813,508	1,254,458	1,803,897	1,044,996
Expenditure <sup>28</sup>	Wages, Salaries and Employee Benefits	25,922	28,153	22,925	30,596	45,681	41,461	16,289	15,651
	Administration Costs	17,675	22,700	34,384	20,622	28,952	23,502	52,087	31,220
	Maintenance Management Expenses	9,720	11,421	23,553	10,025	486,831	270,571	1,012,402	751,612
	Maintenance Construction Costs	278,080	290,274	405,318	240,623				
	Development Expenses	-	-	-	-	251,653	1,012,990	1,410,104	1,023,100
	Finance Costs	111	174	900	214	391	226	80,859	31,266
	Other	-	0	-	-	-	-	154,300	126,749
	Total	331,508	352,722	487,080	302,080	813,508	1,348,750	2,726,041	1,979,597
	Surplus/(Deficit)	6,922	(15,690)	0	(88,859)	0	(94,292)	(922,144)	(934,601)

Sources: National Audit Office, *Report of the Controller and Auditor General on the Financial Statements of the Tanzania National Roads Agency for the Year Ended 30<sup>th</sup> June, 2014, 2015, 2016, and 2017.*

According to the balance sheets of TANROADS, its accumulated surpluses were negative, as shown in Table 9, and the amount of deficit increased from 2016 to 2017. Yet, net assets turned into surpluses because infrastructure assets such as roads and bridges became recognized as TANROADS' assets as TANROADS adopted the International Public Sector Accounting Standards, and capital amount (Taxpayers Funds) significantly increased accordingly. In short, there is no specific problem observed in the financial aspect of operation and maintenance.

Table 9. Balance Sheets of TANROADS

(Unit: million Tanzanian shillings)

	2013	2014	2015	2016	2017
Current assets	383,277	383,204	421,325	701,656	284,302
Non-current assets	494,653	1,349,979	1,889,109	4,756,596	19,539,672
Total assets	877,930	1,733,183	2,310,434	5,458,252	19,823,974
Current liabilities	454,397	887,435	1,186,291	1,951,295	1,096,605
Deferred income (Grant)	36,061	10,358	27,062	163,667	97,936
Non-current liabilities	484,227	896,258	1,163,927	3,530,978	434,165
Deferred income (Grant capital)	484,227	896,258	1,163,927	3,530,978	434,165
Total liabilities	938,624	1,783,692	2,350,218	5,482,272	1,530,770
Total net assets	(60,694)	(50,509)	(39,785)	(24,020)	18,293,203
Accumulated surplus	(66,880)	(56,696)	(45,971)	(30,206)	(281,707)
Total liabilities and Total net assets	877,930	1,733,183	2,310,434	5,458,252	19,823,974

Sources: National Audit Office, *Report of the Controller and Auditor General on the Financial Statements of the Tanzania National Roads Agency for the Year Ended 30<sup>th</sup> June, 2014, 2015, 2016, and 2017.*

Note: As of June 30 of each fiscal year.

<sup>28</sup> Maintenance Management Expenses refer to indirect department costs for the maintenance of the existing roads; Maintenance Construction Costs refer to direct costs necessary for the repair (maintenance) work of the existing roads; Development Expenses refer to costs necessary for constructions to develop new roads.

#### 3.4.4. Status of Operation and Maintenance

Through the site visits and interviews with the officials concerned, it was confirmed that the recommendations made by the Japanese side during the defect liability period, such as removing weeds, cleaning road surface, and monitoring road pavement surface, have been mostly being carried out. The beauty of the road and its median strip is well-maintained particularly around the Lugalo barracks, as students from neighboring schools also participate to remove weeds and clean along the road (see Photo 3). When it comes to road drainage facilities, however, it was observed during the site visits that partially collapsed side ditches and laterally eroded road embankment had been left abandoned (see Photo 4). As mentioned, road flooding has become worse than before in some sections of the road, because the capacities of road crossing culverts and side ditches turned out not to be up to par to handle flow volume during the rainy season. Moreover, after the project completion, surface ponding due to water flowing from the road toward roadside houses has been posing a problem in residents' daily life in relatively widespread areas. During the interviews, a large number of residents voiced complaints against the road flooding and surface ponding during the rainy season in the areas along the road<sup>29</sup>.

In light of the above, some minor problems have been observed in terms of the current status. Therefore, sustainability of the project effects is fair.



Photo 3. Well-Maintained Median Strip



Photo 4. Collapsed Side Ditch and Side Walk  
Due to Heavy Rain

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1. Conclusion

The objective of this project is to ensure smooth and steady traffic on the New Bagamoyo Road in Dar es Salaam by widening its 12.9-km target section between the Mwenge and Tegeta intersections, thereby contributing to the improvement of urban transport mobility and a reduction in the transportation cost of trade

<sup>29</sup> TANROADS officials think that adequate consideration had not been given to the basic design of the project's road drainage facilities. At the same time, they consider that the issue of surface ponding around roadside houses should, in principle, be resolved through urban planning rather than road improvement.

goods such as agricultural produce.

Because this project was consistent with Tanzania's national development policy, road sector strategy, and development needs at the times of planning and ex-post evaluation, as well as Japan's aid policy at the time of planning, its relevance is high. On the other hand, although the outputs of the project had been constructed and procured almost as planned, the project cost and the project period both exceeded the plan. Therefore, the efficiency is fair. As a result of improving New Bagamoyo Road, the driving time required during peak hours is reduced to a quarter of the level of the time of planning even at the time of ex-post evaluation, despite a dramatically increased traffic volume. Thus, the likelihood that the target of the average traffic speed would have been met had been measured immediately after project completion is high. In addition, the reduction of transportation cost is achieved to a certain extent, as the fuel cost of a traffic vehicle has been lowered due to a shorter driving time. Moreover, urban transport mobility is improved as the availability and frequency of public bus services have substantially increased after project completion. As evidenced by residential land and commercial developments along and near the road, positive impacts on fueling the local economy and increasing employment opportunities have also been recognized. Therefore, the effectiveness and impact of the project are high. As for the operation and maintenance of New Bagamoyo Road, no problems have been identified in terms of the institutional, technical, and financial capacities of the executing agency. However, there is some problem in the status of operation and maintenance because flooding and surface ponding in some roadside areas outside the road construction sites have become worsened after project completion. Therefore, the sustainability of the project is fair.

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

#### 4. 2. Recommendations

##### 4. 2. 1. Recommendations to the Executing Agency

None

##### 4. 2. 2. Recommendations to JICA

None

#### 4. 3. Lessons Learned

##### Formulating a Plan While Taking into Full Account the Components Other Than the Main Road, Such as Road Drainage Facilities, and Securing Funding to Implement It

The problem of road flooding and surface ponding in the areas along the road became worse in some sections of the road after completion of the project. Consequently, despite that the project has contributed not only to ensuring smooth and steady traffic and improving transport mobility but also to fueling the local economy, many residents have negative impression on the project.

The probable fundamental causes of the problem are disorderly residential land development and deforestation in the upstream areas of the road, as well as drainage connections without considering downstream capacities. Yet, the capacities of the drainage facilities, such as road crossing culverts and side ditches, constructed by the project also turned out not to be up to par to handle flow volume during the rainy season, and it affected the problem. The facts that drainage facilities outside the road construction site became out of the scope of this project and that a sediment basin at the upstream of the road and the existing drainage facilities had not been rehabilitated at the timing of the implementation of this project due to budget constraints have led to the problem as well.

Despite a major trunk road, no street lamps have been installed for budgetary reasons, and it has also pushed down the otherwise high overall reputation of the project as many consider it to have negatively impacted on the safety of driving at night. Although which components to include in the scope of the project should be judged on a case-by-case basis, it is deemed desirable that the plan of a project like this one should be formulated at the time of planning by carefully taking into account components other than the main road, such as road drainage facilities and auxiliary road structures as well, and its necessary budget should have been obtained<sup>30</sup>.

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<sup>30</sup> On a side note, a grant agreement that extends up to 3.78 billion yen for Phase 2 of this project has been signed for a target section of 4.3km. Considering that a target section of this project (Phase 1) was 12.9km and the actual amount borne by the Japanese side was 5.12 billion yen, it is a dramatic increase. The budget for the Phase 2 project cost reflects the expenses that had not been included in this project, such as rehabilitation of the drainage facilities outside the road construction sites, construction of the side roads, installation of street lamps, poor-quality soil surveys, and physical contingency (5%).