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| Country Name | The Project for Rehabilitation of Bridges on the Asmara-Massawa Road |
| Eritrea      |  |

**I. Project Outline**

|   |   |  |   |
|---|---|--|---|
| Project Cost  | E/N Grant Limit: 663 million yen<br>(1) 270 million yen, (2) 393 million yen  | Contract Amount: 660 million yen<br>(1) 269 million yen, (2) 391 million yen |   |
| E/N Date  | (1) August, 2004 (2) August, 2005   |  |   |
| Completion Date   | March, 2007   |  |   |
| Implementing Agency   | Infrastructure Department, Ministry of Public Works   |  |   |
| Related Studies   | Basic Design Study: March, 2003 – July, 2004  |  |   |
| Contracted Agencies   | Consultant(s)   | Construction Project Consultants, Inc. – Nippon Koei Co., Ltd. (JV)          |   |
|   | Contractor(s)   | Fujita Corporation.  |   |
|   | Supplier(s)   | -  |   |
| Related Projects (if any)   | Other donors' cooperation<br>EU/EDF: improvement of the Asmara-Massawa Road (1993-1997)   |  |   |
| Background  | <p>The Asmara-Massawa Road is a road that directly connects Massawa, the largest international trade port in Eritrea and Asmara, the capital. As much as 98% of the export and import (mostly import) is distributed to all parts of the country through this road. Since there is no alternative route for this road, the Asmara-Massawa Road is recognized as the sole lifeline for Eritrea and given the greatest priority.</p> <p>The road was constructed in the 1930s. After the independence in 1993, EU assisted in the improvement of the road, which included the improvement of small bridges of less than 25m in length but not the six major bridges that are 25m or longer due to budgetary constraints. This Grant Aid project was therefore requested for improvement of those bridges.</p> |  |   |
| Project Objectives  | Outcome   |  |   |
|   | To secure a smooth and safe traffic on the Asmara-Massawa Road (110km in length), the arterial road that connects Asmara the capital and the international trade port in Massawa, by improvement of major five bridges on the road.   |  |   |
|   | Outputs(s)  |  |   |
|   | Japanese Side   |  |   |
|   | Improvement of bridges on the Asmara-Massawa Road (110km in length):  |  |   |
|   | Name of bridge  | Location (from Asmara)   | Construction works  |
|   | Gindae Bridge   | 45km   | Construction of a new bridge together with the construction of the bypass <sup>(Note)</sup> |
| Gahtelay 1 Bridge   | 69km  | Replacement of superstructure of the existing bridge                         |   |
| Dogali 1 Bridge   | 94km  | Repair of the existing bridge  |   |
| Dogali 2 Bridge   | 97km  | Construction of a new bridge in a location near the existing bridge          |   |
| Emculu Bridge   | 105km   | Repair of the existing bridge  |   |
| (Note) The Eritrea side was responsible for the construction of the Gindae Bypass around the same time as this project (outside the scope of this project). |   |  |   |
| Eritrea Side  |   |  |   |
| - Land acquisition  |   |  |   |
| - Necessary procedure for the construction works  |   |  |   |
| - Demining upon necessity   |   |  |   |
| - Civil works associated with the bridge construction   |   |  |   |

**II. Result of the Evaluation**

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| Summary of the Evaluation  |
| <p>After the independence in 1993, Eritrea started its efforts to reconstruct infrastructure that had been heavily damaged due to the 30-year military struggle for independence. However, the six bridges over 25m in length on the Asmara-Massawa Road were not included in the target of the improvement of the road, and were left in a dangerous condition with breakage of some major components due to aging and collision<sup>1</sup>. Since this road was the lifeline that connected Massawa, the Eritrea's largest trade port, and Asmara the capital without alternative routes, there were concerns that leaving the bridges as they were would possibly cause hindrance to the traffic and lead to negative effects on the Eritrean economy.</p> |

<sup>1</sup> The Basic Design Study for this project found that one of the six bridges still had enough soundness at that time (and therefore excluded from the scope of this project).

This project has mostly achieved its objective of securing a smooth and safe traffic on the most important arterial road by improving the major five bridges on it, as the reinforcement of the structures extended the lifetime of the bridges, and the indicators (such as waiting time for letting oncoming vehicles pass) mostly reached the expected level. As for sustainability, while operation and maintenance (O&M) of the bridges are smoothly carried out under the O&M system in the semi-public sector, some problems have been observed in terms of the financial aspects and current status of O&M due to the reduction of budget and some damages that are left unrepaired.

For relevance, the project has been highly relevant with Eritrea's development policy, development needs as well as Japan's ODA policy at the time of both ex-ante and ex-post evaluation. For efficiency, the project period slightly exceeded the plan.

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

#### 1 Relevance

This project has been highly relevant with Eritrea's development policy "Reconstruction and maintenance of the Asmara-Massawa Road" as set in the Road Sector Development Plan of Eritrea (2003 and 2005), development needs (improvement of bridges on the most important arterial road with no alternative route), as well as Japan's ODA policy to assist in the reconstruction and development of infrastructure, at the time of both ex-ante and ex-post evaluation. Therefore, relevance of this project is high.

#### 2 Effectiveness/Impact

This project has mostly achieved its objective of securing a smooth and safe traffic on the most important arterial road by improving the major five bridges on it. Based on the interview with the implementing agency, the reinforcement of the structures extended the lifetime of the bridges (though the specific number of years was not clear). The newly-constructed three bridges had two lanes, which eliminated two-way traffic and thus reduced the waiting time for letting oncoming vehicles pass to zero. On the two bridges that were repaired, the waiting time was almost the same as before the project (i.e., as planned), indicating that the traffic condition has not worsened. Also, the Gindae Bridge, a new bridge on the Gindae Bypass that the Eritrean side constructed around the same time as this project, has improved traffic safety as heavy vehicles now use the bypass and do not travel through busy downtown any more. The traffic volume of the target road sections has not changed from before the project as far as the collected data tells.

Regarding the impact, goods that are landed at the Massawa Port for land transportation to Asmara are all transported on the Asmara-Massawa Road, the only arterial road. Based on the interview with the implementing agency and site observation, it is obvious that the improvement of the bridges by this project has enhanced the distribution of goods. Also, there observed development along the road such as irrigated agriculture and markets. In addition, no negative impact was seen on natural environment.

Therefore, effectiveness/impact of this project is high.

#### Quantitative Effects

|   | Base line value (year of BD) (2003)  | Target value (target year) (2008)  | Actual value (target year) 2008  | Actual value (ex-post evaluation year) (2011)  |
|---|--|--|--|--|
| Maximum waiting time for letting oncoming vehicles pass on the target bridges               | (actual value) maximum 4 minutes (due to two way traffic on one lane)      | (target value) 0 minute (double lanes eliminated waiting time for oncoming vehicles) | (actual value) 0 minute  | (actual value) 0 minute on the double-laned three bridges  |
| (Supplementary indicator) Annual average daily traffic on the target bridges (vehicles/day) | (actual value) (2004) 814 around Gindae Bridge<br>593 around other bridges | (target value) N/A   | (actual value) 472 (estimated based on one-hour traffic count in a JICA study) | (actual value) 554 at Nafasit (between Asmara and Gindae) (count by Ministry of Transport and Communication) |

Sources: JICA and Ministry of Transport and Communication

Note: although the Basic Design study did not designate this supplementary indicator as an indicator for evaluation, it was used to check whether the road (with bridges) has been used in the same volume as before the project.

#### 3 Efficiency

Although the project cost was as planned (ratio against the plan: 100%), the project period slightly exceeded the plan (ratio against the plan: 111%) because it took time for detailed design and tender. The outputs were produced mostly as planned. Therefore, efficiency of this project is fair.

#### 4 Sustainability

The facilities developed by the project are maintained by the Construction Corporation in the semi-public sector, and the implementing agency Department of Infrastructure, Ministry of Public Works is responsible for supervision of maintenance works. Although the status of the Construction Corporation was changed<sup>2</sup>, it was to streamline the organizational structure of maintenance and thus appropriate for the continuity of the effects of this project. In the technical aspect as well, no problem has been observed as the Corporation provides regular training to its staff and invests in human resources and equipment.

<sup>2</sup> The Construction Corporation was the Road Transport Construction Department (at the time of the ex-ante evaluation of this project) before it was transferred to the semi-public sector.

In the financial aspect, while specific budget information was not available, it is considered that a certain amount of budget is allocated for maintenance of the target bridges as the Department of Infrastructure has allocated road maintenance budget in general, and the maintenance cycle, namely, periodic checking of road conditions – repair planning – budget allocation – implementation of repair work, is functioning. At the same time however, a downward trend is seen in the amount of budget compared to the time of the ex-ante evaluation.

As for the current status of operation and maintenance, the steady implementation of road maintenance despite the budget decrease is seen in that (i) the road maintenance cycle is functioning as mentioned above, (ii) overloading control, which is crucial particularly for ensuring the durability of the two repaired bridges, is properly practiced according to the Ministry of Transport and Communication, and (iii) no noticeable damages are seen in the structure of the mentioned two bridges. On the other hand, damages on the portal bracings that were pointed out in the defect inspection study still occur repeatedly (but repaired in each case). Also, minor problems are seen on the Gindae Bridge such as a missing steel lattice drain cover and damage on the bridge name plate.

Therefore, the project has some problems in the financial aspect and the current status of operation and maintenance, and sustainability of the effects of this project is fair.

### III. Recommendations & Lessons Learned

#### Recommendations for Implementing agency

While the bridges are generally maintained well, there is a room for improvement such as the missing lattice drain cover on the Gindae Bridge and delays in repair of portal bracings.



Gindae Bridge (new construction) and the bypass road



Dogali 2 Bridge (new construction) (existing bridge at the back)



Baring of Emculu Bridge (repaired)