

Country Name	Project for Operation and Maintenance of Trunk Road: Goha Tshion-Dejen across Abay Gorge (Equipment Supply)
Federal Democratic Republic of Ethiopia (FDRE)	

I. Project Outline

Background	Major issues in the Ethiopian road sector are the low road density and the poor road condition. Although the government, with assistance from donors, had implemented programs for rehabilitation of trunk roads, construction of provincial roads, and ring roads, further efforts are still needed for increasing the road density and also for capacity development for road maintenance. The National Route 3 is one of the principal trunk roads, as it is part of the longitudinal corridor in East Africa connecting Sudan to the Ethiopian heartland through Amhara Region which is the granary in the country. The Abay Gorge zone on this route is a precipitous area with height difference of 1500m. The unstable geographical conditions of the gorge and a spate of the concentrated heavy rain in the rainy season triggered frequent disasters including landslides to hinder the smooth traffic. However, the Ethiopian Roads Authority (ERA) did not have sufficient equipment to conduct timely restoration works against damages caused by frequent landslides in this zone.				
Objectives of the Project	To shorten the time to start restoration works for damages by landslides in the areas vulnerable to landslide along the National Route 3 (Goha Tshion-Dejen), by procuring equipment necessary for landslide prevention and restoration, in order to maintain the function of the National Route 3.				
Outputs of the Project	<ol style="list-style-type: none"> 1. Project Site: Areas between Goha Tshion-Dejen (about 40km) of the National Route 3 vulnerable to landslide 2. Major Project Component: Procurement of equipment for landslide prevention and restoration: Excavators, hydraulic bakers, wheel excavators, bulldozers, wheel loaders, dump trucks, etc. 3. Ethiopian Side: Land acquisition and preparation for the asphalt plant and the aggregate plant, work related to distribution of electric power, water supply and drainage for the asphalt plant, payment of the bank commission, tax exemption, personnel assignment for road maintenance, etc. 				
Ex-Ante Evaluation	2010	E/N Date	June 25, 2010	Completion Date	November 17, 2011
Project Cost	E/N Grant Limit: 960 million yen, Actual Grant Amount: 867 million yen				
Implementing Agency	Ethiopian Roads Authority (ERA), Ministry of Transport (MOT)				
Contracted Agencies	Katahira & Engineers International, Itochu Corporation				

<Special perspectives considered at the ex-post evaluation>

At the ex-ante evaluation, two qualitative effects were set forth to verify the effectiveness: 1) maintenance of road network in the landslide-vulnerable areas on the route between Goha Tshion and Dejen, and 2) contribution to development of landslides control technologies. However, these are the result of the shortened time to start restoration works from landslide damages, and therefore these were considered as impacts of the project.

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Ethiopian at the time of ex-ante and ex-post evaluation></p> <p>The project has been consistent with Ethiopian development policies, as development of the road infrastructure has been prioritized in the “Plan for Accelerated and Sustained Development to End Poverty (2007),” “Growth and Transformation Plan (2010)” and “Road Sector Development Program IV (2010-2015).”</p> <p><Consistency with the Development Needs of Ethiopia at the time of ex-ante and ex-post evaluation></p> <p>The project has met the needs for maintenance of the trunk road along the Abay Gorge on the National Route 3, which is a precipitous area which suffers from frequent landslides.</p> <p><Consistency with Japan’s ODA Policy at the time of ex-ante evaluation></p> <p>The project was consistent with the “Country Assistance Program for Ethiopia (2008),” in which one of the priority areas is the socio economic infrastructure, and related to this, it is described that the assistance will be focused on the development of transportation infrastructures for facilitating trading of agricultural products and inputs.</p> <p><Evaluation Result></p> <p>In light of the above, the relevance of the project is high.</p>
2 Effectiveness/Impact
<p>The project aimed at shortening the time to start restoration works for damages by landslides in the areas vulnerable to landslide along National Route 3 (Goha Tshion-Dejen), by procuring equipment necessary for landslide prevention and control, in order to maintain the function of the National Route 3.</p> <p><Effectiveness></p> <p>The project has mostly achieved the objective “to shorten the time to start restoration works for landslide damages after the decision is made for action.” The equipment station moved from Addis Ababa (200km from the landslide area) to Dejen and Goha Tshion (20km from the landslide area). As a result, the required time has significantly decreased (5 hours to 45 minutes), although it takes 15 more minutes than the planned due to the rugged terrain in Abay Gorge and slow mobility of heavy machinery. Much improvement has been confirmed also in terms of the qualitative effect. Work efficiency for landslide restoration work has been improved greatly by using the procured equipment such as excavators and bulldozers. Restoration work for 0.5km of landslide used to take 3-5 days, but now it can be done within half a day.</p>

<Impact>

As a result of the restoration works for landslide damages, the number of impassable days between Dejen and Goha Tshion has decreased to zero from 4.5 days on average, as the length of the impassable roads has decreased from 5.8km to zero. Also, the length of the landslide-vulnerable roads has also decreased after constructing countermeasure structures. These effects are the synergy of the Capacity Development Project for Countermeasure Works for Landslide (2011-2016), in which the procured equipment was used. Another expected impact was the project's contribution to the development of landslide countermeasure technologies in the whole country, which is highly appreciated by ERA though concrete example of contribution could not be confirmed. There has not been necessity for organized technology transfer to other parts of the country, because the Emergency Works Team (EWT) (explained below) is responsible for road emergencies including landslide, and EWT's skilled staff can be transferred to other landslide vulnerable sections, when needed.

Other positive impacts include first, decrease of landslides. The procured equipment has been used also for landslide prevention works, such as safety barriers against rock fall and horizontal boring. There were six landslide vulnerable stations between Goha Tshion and Dejen, but currently the problems at four stations were completely solved (there have been no landslides). Second, the nearby residents can reach the urban areas for agricultural markets and health centers much faster than before and students can commute without fear of road blockage.

One negative impact has been observed. The surrounding area of the aggregate plant at Dejen has been polluted with dust and noise. ERA informed the municipality about the project and requested not to allow the people to reside within a one km radius of the plant. However, the municipality did not enforce the request, and the number of the settlers around the plant is increasing.

There was land acquisition for constructing landslide prevention structures. The livestock farmers were compensated by replacement land¹, and no problem has risen.

<Evaluation Result>

In light of the above, the project effectiveness/impact is high.

Quantitative effects

Indicator	2010 (before the project) Actual value	2011 (target year) Target value	2011 (target year) Actual value	2012 Actual value	2013 Actual value	2014 Actual value
Time to start the restoration works for landslide damages after the decision is made for action (hours) (Equipment transportation time to the land slide site in the Abay Gorge Section from the parking site)	About 5.0	About 0.5	About 0.75	About 0.75	About 0.75	About 0.75

Source: ERA

Note: Before the project, the rental equipment for landslide countermeasure works along the National Route 3 in Abay Gorge section was available in the outskirts of Addis Ababa. This equipment needed to be transported between Addis Ababa and Abay Gorge with a distance of about 200km taking about 5 hours approximately. By placing the procured equipment at Goha Tshion and Dejen (20 km from the work place), the time for transportation was expected to be reduced from 5 hours to about 0.5 hours.

3 Efficiency

The project cost was within the plan (ratio against the plan: 90%), but the project period was longer than the plan (ratio against the plan: 142%) because it took more months for procurement and shipping of the motor graders. Also, some procurement had missing spare parts and manuals which needed to be shipped later. Therefore, efficiency of the project is fair.

4 Sustainability

<Institutional Aspect>

ERA was restructured in 2011, but it has fulfilled its responsibilities expected at the time of the ex-ante evaluation. Currently, the Alemgena Road Network Management Directorate (RNMD) under ERA is responsible for planning and budgeting of road maintenance in Abay Gorge with the procured equipment, and EWT of Alemgena RNMD conducts road maintenance works including landslide countermeasure works. Goha Tshion Unit of EWT is in charge of Abay Gorge. The number of the personnel of Alemgena RNMD is 50, and EWT has 210 staff including 18 permanent staff and 86 contract employees for the work between Goha Tsion and Dejen. These numbers are more than the expected and sufficient for operation and maintenance of the procured equipment.

<Technical Aspect>

The staff of EWT has sufficient techniques for landslide restoration works and maintenance of the procured equipment. Since ERA employs only those who already have sufficient level of know-how of operation and maintenance of the equipment, technical training is not given to the new staff. EWT staff has gained techniques for horizontal boring for drainage through JICA's ongoing technical cooperation project². The manuals on operation and maintenance of the procured equipment have been used upon necessity.

<Financial Aspect>

The budget of ERA which comes from the central government has been annually increasing. The planned budget for maintenance of roads and equipment and construction and rehabilitation of roads for 2014/15 was 29,059 million Ethiopian birrs (ETB) (almost twice of that for 2010/11). This can be said to be sufficient, as road maintenance and equipment maintenance have been conducted without major problems. Also, sufficient budget has been secured for EWT. The planned budget of EWT (Goha Tsion-Dejen) for 2014/15 was 36 million ETB, sufficient to cover the cost for operation and maintenance of the procured equipment, necessary fuel and oil, and staff hired after the project completion.

<Current Status of Operation and Maintenance>

All equipment has been in good condition except a bulldozer and an asphalt distributor for EWT's landslide countermeasure works. These two have not been repaired due to the unavailability of spare parts. These sophisticated parts are not available in the local market. ERA has neither the necessary capacity for producing these spare parts and consumables nor the authority for purchasing them from

¹ According to the Ethiopian Constitution, all land is owned by the government. Farmers have the right to use their plot and transfer that right to their off springs.

² Capacity Development Project for Countermeasure Works for Landslide (2011-2016).

abroad. Operators conduct daily check and maintenance at the site, assisted by mechanics and electrical workers. Medium and large scale maintenance works are conducted at EWT Workshop or ERA Central Workshop. Road maintenance work is monitored quarterly by EWT office in Addis Ababa, and the equipment status is regularly reported to ERA management.

<Evaluation Result>

Slight problems have been observed in the current status of operation and maintenance of the implementing agency. Therefore, sustainability of the project is fair.

5 Summary of the Evaluation

The project has mostly achieved the objective “to shorten the time to start the restoration works for landslide damages after the decision is made for action,” and brought several positive impacts such as reduction of the time for landslide restoration works and reduction of the impassable days in the target section. On the other hand, a pollution problem has been brought to the people who reside very near the aggregate plant. Regarding the sustainability, two machinery has been out of use due to the unavailability of the spare parts. As for the project efficiency, the project period was longer the plan because it took more months for procurement and shipping of the motor graders. Also, some procurement had missing spare parts and manuals which needed to be shipped later.

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

III. Recommendations & Lessons Learned

<Recommendations for ERA>

1. It is recommended to get approval from MOT to import the spare parts for the two broken machinery. If difficult, ERA may make a request to JICA for the technical training of the repair through the schemes such as the follow-up of the completed project and dispatch of volunteers.
2. It is recommended to make another request to the municipality of Dejen to recommend the residents who reside near the aggregate plant to move from the polluted area.

<Lessons Learned for JICA>

1. In the projects which include the provision of heavy machinery which are new to the recipient country or needs sophisticated spare parts, it is indispensable to carefully assess the availability of the spare parts and also the technical level of the implementing agency and local repair companies at the preparatory survey, so that the broken machinery would not be left unrepaired. It may not be practical to include any machinery which needs spare parts in the provision package without which the machinery cannot be operated. Or, if it is included, it is necessary to have the soft component for training on the repair of the machinery and production of spare parts.



(Rehabilitated road in Abay Gorge)



(Machinery (Horizontal Boring) in operation)