

Appropriate Technology



World off-track to meet sustainable development goals

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Front Cover: A woman carries a bag of seeds at a FAO-supported distribution site in South Sudan. *Credit @FAO/Stefanie Gliński (see page 32)*

Progress report on Liberian road maintenance project

The Ministry of Public Works of Liberia (MPW) and GIZ have just completed an important pilot road maintenance project in Greater Monrovia. The following report, written by advisor, Abdul Mansaray, concludes that the successful completion of the project will increase opportunities for further developments in the future.



Routine road maintenance drainage cleaning.

Credit: Yana Tumako

The project started in August 2018 with the signing by MPW and GIZ of the necessary financing agreement, with all funding being channeled through the newly established Liberia's National Road Fund (NRF). This allowed work

to begin, with the targeting of selected road defects across the project area.

This was a first-time test for Liberia's recently established road maintenance structures, involving the entire circle of necessary services and procedures and

their interaction with MPW. The learning experience was invaluable with the whole project being successfully completed by 12 August 2019.

GIZ and MPW adopted a hybrid implementation method whereby MPW engineers served as project managers, supported by GIZ Road Maintenance Advisors, with 'on-the-job training' being given throughout the year-long operation.

This enabled all involved to gain essential experience in the following:

- Quantifying and pricing maintenance works;
- Preparing bidding documents, based on newly developed Standard Bidding Documents (SBDs), as supported by GIZ;
- Holding pre-bid meetings that included technical training in relation to competing Small and Medium Scaled Enterprises (SMEs) in the preparation of their respective bids;
- Evaluating bids and award contracts;
- Monitoring and supervising the actual work;
- Checking the quantity and quality of invoiced services and the release for payment certificates.

The success of the pilot is good news for MPW, which now has greatly improved the prospects for implementing further maintenance projects in the future, and with positive anticipation of achieving good results.

Procurement-related activities were also managed by MPW, starting with planning procedures and the new SBDs. Support from GIZ for smaller works proved very useful in preparing tender and contract documents both for this project and for other maintenance operations which will, in due course, also be financed by NRF.

Quality control and quality assurance templates, used during the supervision of the work, were also valuable, with SMEs exchanging excellent communication between the various contracting firms, project managers and employer. Furthermore, Contract Management Procedures (CMPs) are becoming increasingly familiar to local contractors.

Overall, the project was a success

for MPW, GIZ and the local SMEs. As a result, the capacity to manage road infrastructure projects and account for road asset funds has been greatly improved.

One can safely say that, at this stage, we have a good foundation on which build for future progress, potentially involving many other maintenance projects.

Abdul Mansaray is a road maintenance advisor providing professional advisory services to political & implementing partners such as RMMU (Ministry of Public Works), private sector institutions and other relevant stakeholders.

Regular road management

Liberia's 'Capacity Development in the Transport Sector Project' was first launched by the German Cooperation, to be implemented by the GIZ in 2008, with the aim of establishing the necessary institutions to enable the country to implement financially sustainable, and data-based, regular road management.

An IT-supported road management system was promoted to make regular maintenance possible on a properly planned basis. To ensure the financial sustainability of the sector, GIZ supported the setting up of a National Road Fund (NRF), supported by co-funding from the European Union.

As a result, when sufficient funds for road maintenance now become available, the responsible institutions are supported in awarding contracts, on a fully transparent basis, according to newly developed tender documents.

Advisory project support is also provided to enable governmental officials and decision-makers to set priorities for road maintenance projects. Work has also begun on establishing data-based, transparent and sustainable processes for prioritizing such activities, which is making procurement processes more transparent and efficient, while also improving the supervision of commissioned projects.

The approach to road maintenance in the country is now well set-up, enabling the newly commissioned project phase to focus on continued

Liberian road facts

The road network in Liberia is hugely underdeveloped, being among the least developed in West Africa. The country has 10,600 kilometres of road, of which only 657 km are paved. The challenges are multiple, due to all highways suffering the deteriorating impact of heavy rains, lack of maintenance and overloaded trucks. Liberia's long rainy season, in fact, which lasts eight months, leaves most roads inaccessible during that period, with less than a quarter of the country's roads being classified as all-weather.

training and the use of the new systems. Additional outputs include TVET (Technical and Vocational Education and Training), decentralization and road sector safety. There are still a lot of challenges, however.

The major task now is to make the successfully finalized MPW-NRF-GIZ small works contracts for road and bridge maintenance a common practice in Liberia. Rigorous and continuous compliance with rules, standards and processes is the major challenge on the way towards the development of a data-driven, transparent road assets management program. In addition, the planning and implementation processes should be faster and smoother, an objective which will be assured when planning is based on nothing else but sound data.

Potential

Road sector development in Liberia, particularly in relation to road maintenance, have huge potential, as follows:

1. Routine road maintenance is predominantly a labour-intensive activity which could deliver exponential job creation benefits. Given Liberia's high rate of youth unemployment, an intensive approach in road maintenance could help boost the local economy.



Abdul Mansaray: "My desire is to contribute to the development of Liberia's infrastructures, especially the road sector. Working with project partners, I wish to play a critical role in achieving proper processes, such as planning, design, procurement and maintenance, helped by good patience and knowledge during the necessary interactions that take place. My goal is to properly manage and finish the maintenance works, keeping within contract deadlines. Some SME contractors have limited knowledge of routine maintenance contracts, of course, and need to be well supported to improve their delivery of ongoing contracts. In addition, community dwellers constantly drop debris inside drainage areas after the contractors have cleaned a particular road section. This is an issue which needs to be given more stakeholder attention. The biggest challenge in my work, however, is dealing with partners who want to take shortcuts in order to get the job done on time. I have to persuade them that taking shortcuts is not only unethical but can be dangerous and can sometimes add to an already difficult task. As an advisor, it's vital to gain the cooperation of all partners in order to protect the integrity of the work being done so that it stands as a prime example of quality for future developments to follow.

Credit: Yana Tumakova

2. The continuous development of technical capacities across Liberian SMEs is still needed, as well for MPW's engineers and management, potentially supported by study tours or international programs.
3. Most important of all, there is an urgent need for a road maintenance training centre to be created in Liberia to ensure the development of qualified road construction and maintenance personnel. The need for training is vital if the sector is to be able to move forward on the basis of improved efficiency and professionalism.

Implementing a bridge management system in Liberia

A strong network of bridges is essential for connectivity in Liberia, a country which has numerous rivers and has faced a major bridge reconstruction challenge since the establishment of a democratically elected government, following 15 years of civil war. During the country's period of unrest, the registers, schemes and descriptions of many bridges were either lost or destroyed, adding significantly to Liberia's reconstruction needs.



St.Paul Bridge in Monrovia.

Credit: Yana Tumakova



MPW Resident Engineer explains the measures done.

Credit: Yana Tumakova

Responding to a request from the country's Ministry of Public Works (MPW) for assistance in implementing a new Bridge Management System (BMS), GIZ has provided an Integrated Expert (IE), with a vast experience in bridge construction and bridge maintenance, to help with the reconstruction programme.

Task and Challenges

BMS is a tool which facilitates the appropriate management of bridges through the implementation of good original design, construction, operation and maintenance. In this context the tasks undertaken by the Bridge Management Team are as follows:

- Implementing a fully functioning BMS - this includes training of local staff.
- Creating a design office for structures, especially bridges.
- Improving quality control aspects concerning all bridge projects.

As most previous bridge drawings had been destroyed prior to 2017, no database of the country's bridges was available. Even the exact number of bridges was unknown. As a result, the new BMS had to be started at the very beginning with the creation of a whole new database.

Assessments

Working with the assistance of experts and advisors of the project 'Capacity Development in the Transport Sector in Liberia (CDTS)', the MPW Bridge Unit has assessed the relevant structures, producing a cost estimate for all minor repair works.

As drawings were not available for relevant structures, the first assessment step involved getting an overview of all bridges in Liberia and producing drawings of each of them. With 4,000 bridges to be assessed, this was a Herculean task, especially as the MPW Bridge Unit consists of just three civil engineers and a team leader.

To enable assessments to be completed in as short a time as possible, assistance was sought from the Faculty of Civil Engineering at the University of Liberia. The idea was to involve graduating students to the geometric repro-



Broken bridge in Liberia.

Credit: Yana Tumakova



Road preparation.

Credit: Archie Konway

duction of the structures, after structures were measured under the supervision of a Bridge Unit Team engineer.

Cooperation

The Bridge Unit collaborated successfully with the Millennium Challenge Corporation (MCC), supported by GIZ, in an advisory capacity. Compatible data formats were identified between MPW and MCC for the registration of bridges to enable the long-term usability of different IT systems.

As a result, the full cataloguing of bridges in Liberia is now underway with about 50% of the country's bridges having already been recorded.

MCC enhanced the project by providing the University with 20 computers, equipped with the necessary CAD software, while the Bridge Unit's engineers taught the students how to use the facilities provided.

With bridge data captured and digital drawings created, the results of the work to date have been accepted by the Volpe Center of the US Department of Transportation as representing a 'high quality' operation.

The project "Capacity Development in the Transport Sector in Liberia" is being implemented by GIZ and co-funded by the Ministry of Economic Cooperation and Development of Germany (BMZ) and the EU.

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Barrier maintenance.

Credit: Archie Konway