

## Output-based aid in Chad Using performance-based contracts to improve roads

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Despite Chad's recent debut as an oil exporter, its people rank among the world's poorest. Large parts of the country are left in extreme isolation by the lack of a backbone road network that is passable year-round. To tackle the poor internal integration, the government formulated the National Transport Program in 1999. And to address the need for sustainable road maintenance, it started a pilot project that moves from traditional input-based planning and contracting of maintenance to the more output-based approach known as performance-based maintenance and management of roads (PMMR). The International Development Association has provided funding for the project as part of its efforts to support an efficient and sustainable transport infrastructure—essential for promoting economic growth and development and for achieving the Millennium Development Goals. A private operator has been contracted to provide road services. Results so far are encouraging, and the government plans to expand the share of the road network covered by PMMR contracts. The PMMR arrangement is being replicated elsewhere in Sub-Saharan Africa, including Burkina Faso, Cape Verde, Madagascar, and Tanzania.

Chad ranks among the world's poorest countries, with annual per capita income of \$250 and four-fifths of its population living on less than a dollar a day in 2004. The high poverty levels are related in part to Chad's often harsh environment and to the scattering of its population among regional enclaves. In some seasons traveling to markets to sell or purchase food and other necessities becomes nearly impossible. The Salamat region, for example, known as the potential breadbasket of Chad, remains mostly unreachable for larger vehicles for up to half the year. Transport costs can sometimes represent well over half the price of goods sold in the market.

Of Chad's primary road network, consisting of around 6,200 kilometers of roads, only about 10 percent are paved. The rest are mostly earth roads that are largely impassable for several months of the year. In addition, 30,000 kilometers of more rudimentary tracks link villages and provide access to the primary network.



Before PMMR



After PMMR

Chad has been contracting out all road maintenance to private contractors since 1994. While this has brought some improvements over the previous force account arrangements, the results are still less than satisfactory. One reason is the use of traditional civil works contractual arrangements for road maintenance. Contractors are responsible for carrying out physical works defined by the government and are paid

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on the basis of the “inputs”—that is, the execution of works. So they have a vested interest in executing large, lumpy works and little or no incentive to carry out the many small activities needed to ensure that roads are in good condition over a long period. This contracting approach has generated a vicious circle of heavy rehabilitation works followed by long periods of neglect and thus rapid deterioration. Adding to the problem has been the limited institutional capacity to consistently plan and supervise effective road maintenance.

Another reason for the poor condition of roads has been insufficient mobilization of domestic funding for maintenance. A road maintenance fund, financed in part from a share of fuel taxes, has been in place since 2001. But because of low traffic volumes, the fund covered only about 60 percent of road maintenance needs. A recent increase in 2005 of the share of fuel taxes going to the road maintenance fund has brought this up to about 80 percent of maintenance needs.

## How PMMR contracts work

Given the poor results with traditional road maintenance contracts, Chad’s government decided to pilot a performance-based contract for the maintenance and management of roads (PMMR). PMMR contracts are aimed at ensuring that the condition of roads adequately meets users’ needs over a period of several years by expanding the private sector’s role from simply executing works to managing and maintaining road assets. Australia, New Zealand, the United States, and several Latin American countries—most notably Argentina, Brazil, and Uruguay—have in place PMMR or similar contracts covering thousands of kilometers of roads. And many countries in Africa, Asia, and Europe have now started to introduce PMMR contracts, often with crucial support from donor agencies that have recognized the benefits of output-based approaches for poverty reduction and sustainable development (box 1).

PMMR contracts are awarded through competitive bidding, with potential service providers proposing a monthly lump-sum fee per kilometer of road to be managed and maintained. The contractors are not paid directly for “inputs”—the physical works executed—but for the final “output” or outcome—the achievement of predefined levels of service quality on the road sections under contract.

Since the contractors bear all responsibility for designing, scheduling, and carrying out works, they can decide what activities to undertake—and how, when, and where—to meet the required service levels and other performance specifications. The contractors re-

### Box 1 Defining output-based aid: Chad’s PMMR

Output-based aid (OBA) is a mechanism for *providing explicit performance-based subsidies* to support the delivery of basic services where policy concerns—such as limited affordability for some consumers, a desire to capture positive externalities, or the infeasibility of imposing direct user fees—justify public funding to complement or replace user fees. At the heart of the OBA approach is the contracting out of service delivery to a third party that will operate within a strong performance regime *linking payments to results*. This approach can sharpen the focus on objectives, improve efficiency and innovation, enhance accountability for the use of public resources, and create opportunities for engaging private sector know-how and in some cases financing.

The Chad PMMR channels subsidies explicitly to the delivery of defined services—rehabilitating, maintaining, and managing specific roads. Through this means it aims to reach the poor; much work has recently highlighted the strong link between access to roads, particularly primary trunk roads, and poverty reduction. The subsidies are supplementing the resources of a road fund (which is financed mostly by a share of fuel taxes) because of the infeasibility of charging individual users, such as through tolls, on most roads but particularly in Africa.

The contract makes payments largely contingent on the delivery of defined outputs, thus transferring performance risk to the service provider. The competitive bidding for the contract has already led to efficiency gains, with the winning bidder requiring a lower fee than the government and its advisers had estimated.

ceive a fixed monthly payment, regardless of the works carried out, as long as the road is in the required condition. So PMMR contracts create incentives for efficiency and allow technological innovation, possibly resulting in long-term cost savings.

## Getting started in Chad

Both Chad’s National Transport Program and the related pilot PMMR contract, supported by the International Development Association (IDA), are aimed at reducing poverty and rural isolation—by providing a well-maintained, reliable, basic backbone road network connecting regions and linking rural and urban areas.

## Targeting the poor

The World Bank's 1997 Poverty Assessment for Chad provides empirical evidence that improving access to roads plays a key part in boosting agricultural income and enhancing the quality of life in poor rural communities. More broadly, recent research papers show that investing in primary roads is critical in reducing poverty and in achieving several of the Millennium Development Goals.

Evidence from participatory consultations in rural and urban areas of Chad supports this viewpoint. Most village populations can reach primary roads and other villages by using the extensive network of paths, and while this access is sometimes interrupted, the interruptions are usually relatively short-lived. What affects people much more severely are long interruptions in access to the primary road network during and after the rainy season. The lack of year-round access to markets has several serious consequences:

- It constrains the development of agriculture, industry, and commerce, resulting in higher consumer prices and lower producer prices.
- It undermines food security, posing higher risk of famines.
- It weakens the effectiveness of social services such as education and health care.

The primary network will no doubt have to be complemented by improved rural and feeder roads. But providing a good primary network is the critical first step.

## Awarding and executing the contract

In late 2000 the Chad government launched a competitive international tender for a contract covering 441 kilometers of unpaved main roads (7 percent of the primary network) stretching from Bokoro through Mongo and Mangalme to Oum Hadjer—sections previously passable only during the dry season (see map). After prequalification three bidders each presented an offer. The government awarded a four-year PMMR contract to DTP, a subsidiary of the French firm Bouygues, in early 2001. The bids were evaluated on the basis of the monthly lump-sum fee required. The winning bid came in around 7 percent lower than had been predicted.

As long as DTP complies with the service quality levels, it receives a monthly fee of \$480 per kilometer. This fee covers, among other things, fully rehabilitating the road at the outset, managing and maintaining the road for four years, monitoring compliance with the



performance criteria, and providing basic aid in road accidents. DTP received an advance payment of 20 percent of the contract value, for which it had to provide a guarantee. DTP also had to come up with a performance guarantee of 10 percent of the contract value.

The contract designates four service quality criteria, or “outputs”: passability (the road must be open), average speed attainable, user comfort, and durability (a measure of the long-term sustainability of the road). Two mechanisms are used to monitor compliance with these criteria. First, the contractor performs self-monitoring, submitting a report to the government with each monthly invoice. Second, a consultant verifies the self-monitoring reports through monthly inspections. (The government appointed SADEG, an engineering consulting firm in Cameroon, to this monitoring role.) If the contractor fails to comply with any of the service criteria in any one month, its fee is reduced. If it fails repeatedly to comply, its contract can be suspended.

## Progress to date and lessons learned

DTP started contract execution in July 2001, three months after signing the contract. It had 22 months to bring service quality up to the required levels.

The contractor has complied with and in many cases exceeded the service quality level requirements. The roads are in excellent condition and the road users are highly satisfied. In fact, one criticism of the scheme is that the quality of the roads is “too high”: the roads are now amongst the best in the region, and one may question whether costs could have been lowered with

less ambitious targets. The Chad PMMR contract was well designed on several counts:

- Although no detailed assessments have been made yet, the PMMR contract is expected to result in long-term capital cost savings. In Australia, New Zealand, and the United States PMMR contracts have led to cost savings of 10–20 percent and higher maintenance standards for road assets than under traditional contracts (Zietlow 2004). And PMMR-type contracts in Argentina have been estimated to reduce capital investment needs by 30 percent (Liautaud 2001).
- The PMMR contracts in Chad provide the possibility for long-term sustainability. The fact that PMMR-type contracts in general have demonstrated large reductions in required long-term capital expenditure itself demonstrates a more sustainable road maintenance and management system than those that came before it. The benefits of improved management and maintenance have motivated the Government to gradually increase the funding for its Road Maintenance Fund, for example through the recent larger allocation of fuel taxes to it. Although continued donor support may be required in the immediate future, Chad may eventually move to a more self-sustaining system for management and maintenance, especially if it is able to use some of its resources from oil exports for the Road Maintenance Fund.
- The existence of donor involvement has given the private contractors more confidence that the output-based payments will actually get paid.
- The PMMR contract covers roads that were not so badly deteriorated as to undermine its chances of

success. PMMR should not be used for roads in extremely bad condition. If initial rehabilitation costs exceed 40–45 percent of the total cost of the contract, rehabilitating the roads through a traditional works contract and then applying PMMR is a better way to go.

- The bidding process included prequalification, ensuring that final bid evaluation was not overwhelmed by poor-quality providers.

Encouraged by the success, the government plans to extend the contract when it expires in June 2005 or to rebid the contract for another four years. Renewal would be based on a lower price, since the contractor has completed the initial rehabilitation requiring large up-front investments. The Government is also planning for a new PMMR contract covering around 650 kilometers of paved roads, to link key centers in Chad and Cameroon.

The PMMR arrangement is being replicated elsewhere in Sub-Saharan Africa, including Burkina Faso, Cape Verde, Madagascar, and Tanzania.

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