UPGRADING OF RURAL ROADS IN NAMIBIA: LABOUR-BASED UPGRADING OF DISTRICT ROADS IN THE OSHANA AND OSHIKOTO REGIONS IN NAMIBIA WITH PARTNERSHIP AGREEMENTS BETWEEN PLANT CONTRACTORS, SMME CONTRACTORS AND THE USE OF LOCAL LABOUR

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ABSTRACT

The Roads Authority of Namibia (RA) has a Regional Road Master Plan for the Oshana, Oshikoto, Omusati and Ohangwena Regions in Namibia, in terms of which the upgrading of rural roads is prioritised in order to alleviate poverty by improving the accessibility and mobility of rural communities.

The DR 3644 from Ompundja to Eheke and the DR 3645 from Onyaanya to Onanke were amongst several roads that were ranked as high priority for upgrading.

For the implementation of the Master Plan, the RA initiated a unique and innovative contractual arrangement to empower and expose local small-, medium- and micro-scale enterprise (SMME) contractors to the contracting environment, while making maximum use of the local workforce in terms of their involvement in improving rural roads.

Plant contractors were appointed with the proviso that they appoint several SMMEs, who would then be responsible for specific sections of the works. The SMMEs were in turn responsible for recruiting task workers from local communities.

SMMEs had to attend special training courses developed and presented by the RA in order to qualify for participation in the tender. During construction, the RA provided ongoing training in order to assist SMMEs with record-keeping and financial control.

This achievement is in line with the expectation of the German Government, who funded the project through the Kreditanstalt für Wiederaufbau (KfW).

Key project indicators are summarised in the table below

Table 1: Key project indicators

Project data	DR 3644: Ompundja to Eheke	DR 3645: Onyaanya to Onanke
Contract value	N$16,268,252.13	N$28,207,380.90
Road length	14.2 km	40.9 km
Initial contract period	450 calendar days	450 calendar days
Contract value of SMME contractors	N$9,160,597.29	N$12,544,792.80
Presentation of total contract value	57%	45%
Person working days created	30,750	96,315
Travelling time: Before	±45 minutes	±2 hours 30 minutes
Travelling time: After	±18 minutes	±45 minutes
Schools served	3	10
Clinics serviced	1	3
Other community centres	1	2

INTRODUCTION

This paper deals with an innovative method developed by the Roads Authority(RA) Namibia in which plant contractors were employed with small-, medium- and micro-scale enterprise (SMME) contractors in partnership agreements, and labour-based construction methods were used in combination with labour input from local communities.

Burmeister & Partners (B&P) were the Consulting Engineers for the detail design, contract supervision, and contract administration.

SCOPE OF WORKS

The scope of the project was the construction of two new district gravel roads in northern Namibia by means of labour-based construction methods. The construction is carried out with a main contractor performing all plant-oriented operations, and SMME contractors performing the labour-intensive activities.

The roads constructed were as follows:

- DR 3644 – 14.2-km length between Ompundja and Eheke in the Oshana Region, and
- DR 3645 – 40.9-km length between Onyaanya and Onanke in the Oshikoto Region.

The typical sand track prior upgrading is shown in photograph 1.

Photograph 1: Typical sand track prior to upgrading

BACKGROUND

Namibia lacks all-weather rural roads in the northern part of the country, which suffered historical neglect although 60% of the population resides there. Their access to schools, clinics and markets for produce is problematic due to heavy sand in the dry season and inaccessibility to certain parts due to flooding in the rainy season.

The RA drafted a Road Master Plan for the Ohangwena, Omusati, Oshana and Oshikoto Regions in 1999, which was regularly updated. In the Plan, the upgrading of sand tracks to gravel district roads was prioritised. Prioritisation was based on a utility analysis, where population numbers and the location of schools, clinics and police stations served as the principal utility indicators. The roads to be upgraded had to form a logical expansion of the existing road network. Since upgrading of these roads would benefit impoverished rural communities, such projects attract funding from donors, part of whose financing objectives are to alleviate poverty.

AIM OF PAPER

The paper describes a method used for the first time in Namibia on two rural road projects, DR 3644 and DR 3645. The aim of the paper is to share the experience, and to describe specific indicators that demonstrate the extent to which the method helped to achieve the projects' objectives.

The broad objectives of the projects were to –

- introduce SMMEs to a contract situation as a stepping stone towards becoming independent contractors
- spend as much of the project funding as possible in cash within the local economy, and
- make maximum use of labour input from the local community.

SMMEs were guided with ongoing training in all aspects of the construction business in order to –

- empower them to obtain bridging finance
- build a good credit record
- develop practical methods to control their own construction work
- monitor their own expenses in relation to daily production, and
- compile their own payment certificates.

Data would be provided on the extent to which job opportunities had in fact been created, and how much cash had been injected into the local economy as a result.

SMME TRAINING AND ASSISTANCE

Pre-tender training

The pre-tender training course was developed by Mr Rudi Polzin, the Senior Engineer responsible for labour-based projects at the RA. The courses were advertised in the local media, and were offered at Windhoek and Oshakati.

The course duration was one week, at the end of which was a written test. A minimum mark had to be achieved in order to qualify for tendering for a SMME contract.

Course content

The course entailed the following:

- Costing of tender proposals
- Programming of activities
- Site management
- Setting out tasks
- Cash flow control
- Tendering
- Project start-up
- Compilation of payment certificates

Ongoing training

The SMMEs that succeeded in securing contracts with a plant contractor received further training. An independent trainee was appointed through the main contractor to assist SMMEs with compiling of monthly payment certificates. This was done on a monthly basis for the first four months, after which it was done every two months.

During monthly site meetings, the RA monitored the keeping of the ledgers, and offered further guidance where necessary.

Bridging finance

Bridging finance is usually a major obstacle for prospective contractors. The reasons for this are mainly the lack of a positive credit record, and the absence of a formal contract. The contracts for the district roads project were structured in such a way that each SMME had a schedule of quantities representing a dedicated section of the works, as well as a partnership agreement between the SMME and the main contractor. Effectively, each SMME had a ‘contract’ with the main contractor, and this could be used as collateral to obtain bridging finance. With this in place, the RA assisted those SMMEs that required help in applying for bridging finance from the Development Bank of Namibia (DBN). The conditions attached to this finance included a six-month

repayment term, that the main contractor be authorised to subtract the monthly instalments from payments made to such SMMEs, and to effect payment on behalf of the SMME to the DBN.

PACKAGING OF THE CONTRACTS

The contracts were unbundled into the following activities:

Main contractor

- Processing fill with plant equipment.
- Processing gravel-wearing course with plant equipment; spreading was done by labourers.
- Transporting of imported fill with tractors and trailers rented from the local communities. Loading was done by labourers.
- Transport of gravel-wearing course material from borrow pits; loading was done by labourers.

SMMEs: Road works (each ±15 km)

- Clearing and grubbing of road reserve
- Importing fill from borrow strips
- Spreading of imported fill
- Spreading of gravel-wearing course material
- Trimming and clearing of road reserve
- Setting up of road signs
- Construction of fencing

SMMEs: Concrete works

- On-site manufacturing of concrete lintels for the small drainage structures
- In-situ concrete floor and abutments
- Large in-situ culverts: floors, abutments and reinforced concrete decks
- Concrete road reserve marker blocks
- Concrete guide blocks

ORGANISATIONAL STRUCTURES

The consultant and contractors

The various contractors and SMMEs for the two roads are listed in Table 1 below:

Table 1: Project contractors and SMMEs

Area of responsibility	**DR 3644: Ompundja to Eheke**	**DR 3645: Onyaanya to Onanke**
Design, contract administration and site supervision	Burmeister & Partners	Burmeister & Partners
Plant contractor	Nexus Civils	Nexus Civils
SMMEs for earthworks	Bema Enterprises	♦ Otjomuise Construction ♦ Kamwiitulwa Electrical Building Contractors ♦ Likondjela Trading Enterprises
SMMEs for concrete works	Waterpower Technical Services	Thohi Construction

Project management

Figure 1: Project management organogram

Contract management

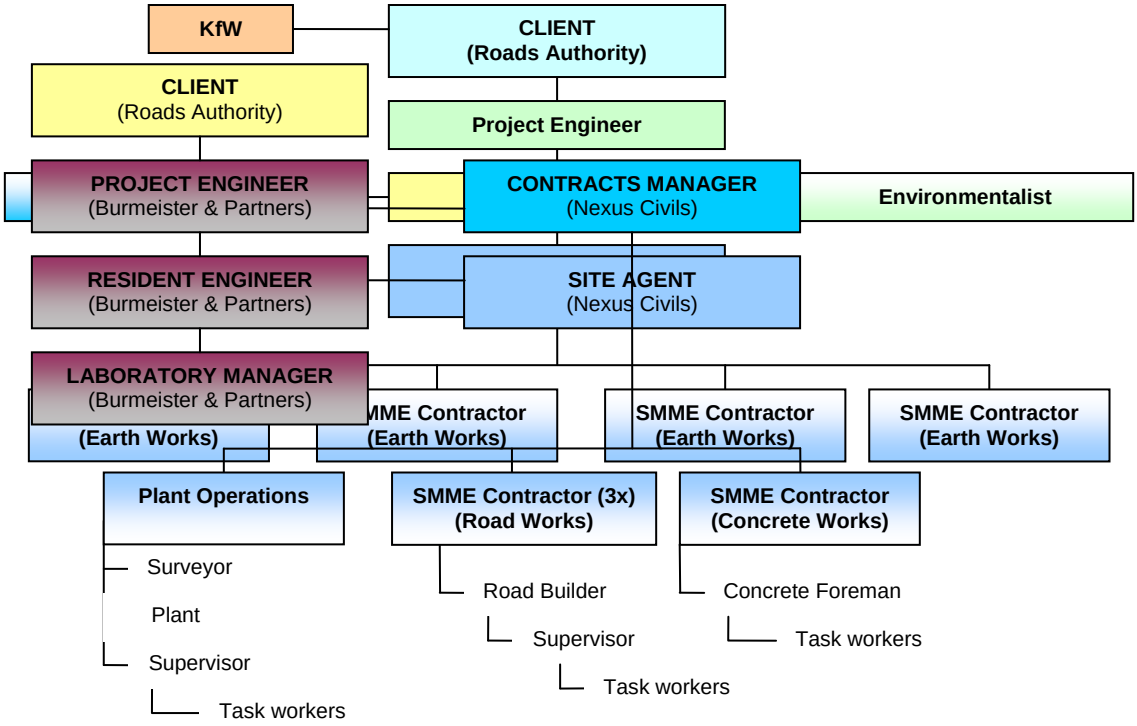

Figure 2: Contract management organogram

As part and parcel of the contract documentation, the plant contractor and SMME contractors were required to enter into a formal partnership agreement. Each SMME contractor effectively had his/her own contract with a separate schedule of quantities, allowing for own preliminary and general items, as well as provision for escalation and retention.

A specific shortcoming in the partnership agreement was that no provision for penalties had been made for a situation where one SMME was delaying the plant contractor's programme. However, the plant contractor was empowered to terminate the SMME's contract if their performance is unsatisfactory.

Tendering

The SMMEs that qualified were introduced to the plant contractor tendering process, and they could approach each other in order to tender in partnership. SMMEs could also submit offers to more than one plant contractor. Similarly, the plant contractor could approach more than one SMME to submit offers. This enabled the plant contractor to select the lowest offer and preferred SMME for partnership. This in itself was new for the plant contractor, and guidance for the RA and the consultants was required.

Technical guidance

Several Excel programs developed by the RA's Senior Engineer were made available to SMMEs during the training course. A specific programme was developed to calculate the fill required, with the output serving as an indication of how wide the borrow strip had to be to ensure sufficient material was excavated. This aimed to avoid excavating excess material. The program was also used to optimise the distance over which fill was imported, as well as calculate and control the task workers' daily tasks.

Financial control and record-keeping

The course material included a comprehensive, tailor-made ledger for recording daily income-earning activities, and direct expenses such as task worker salaries. The program enabled SMMEs

to monitor their 'profitability' on a daily basis, identify problems, and respond appropriately and timeously.

Site arrangements

SMMEs were responsible for their own site arrangements such as the provision of water, food and shelter for task workers. One SMME actually obtained tents, which were relocated as work progressed. This concept was written in as a project requirement in the labour-based contracts that followed.

Social care toward the community

The National Social Marketing Association (NASOMA) visited the construction site on a regular basis. During their visits, the local community was informed about HIV and AIDS, and how to prevent infection. Information pamphlets and condoms were made available to the community at the contractor's site office at all times, and were indeed collected.

Availability of task workers

The conditions stipulated that workers within the project area were to have preference when labourers were appointed. During the rainy season, however, community members were working their fields, planting mahangu (pearl millet). Thus, during this period, SMME contractors had to recruit task workers from outside the area.

Labour-based rates

The Namibian Government regulates labour-based work. Minimum rates for predetermined tasks are fixed and gazetted in order to protect both labourer and employer.

PRACTICAL EXPERIENCE IN UNBUNDLING THE CONTRACTS

The initial approach was that each SMME earthworks contractor would have a ±15-km section of road. The plant contractor was to have an adequate supply of production units, consisting of a grader, water trucks and compactor, in order to carry out the processing of fill and/or gravel-wearing course. This arrangement resulted in the plant contractor either having to relocate production units on a daily basis, over distances ranging from 15 to 30 km on the DR 3645, or to have three production units – one at each section – in order not to fall behind.

In consultation with the SMMEs, the contractor submitted a proposal entailing that the three SMME earthworks contractors would be responsible for approximately seven 2-km sections, with the arrangement that work be done on three adjacent sections. The advantage for the plant contractor was that his two production units could effectively cover a section of 6 km at a time. The RA accepted this proposal on condition that the volume and value of work done by each SMME had to be in the same order as the 15-km section originally allocated to him.

This meant the contractor could cope with two processing teams instead of three

ECONOMIC AND PROJECT INDICATORS

Table 3: Select statistical information

Contract values	**DR 3644: Ompundja to Eheke**	**DR 3645: Onyaanya to Onanke**
Total contract value	N$16,268,252.13	N$28,207,380.90
Contract value of plant contractor	N$7,107,654.84	N$15,662,588.10
% of total contract value	43%	55%
Contract value of SMME contractors	N$9,160,597.29	N$12,544,792.80
% of total contract value	57%	45%
Earthworks and structural layers		
Total fill to be imported and processed		

Contract values	DR 3644: Ompundja to Eheke	DR 3645: Onyaanya to Onanke
Presented in m^3	61,804	121,736
Presented in wheelbarrow loads	1,716,791	3,381,580
Presented in person-working days	15,451	30,434
Presented in community expenditure	N$401,729.25	N$791,284.00
Total wearing course to be imported and processed		
Presented in m^3	17,040	40,940
Presented in wheelbarrow loads	473,333	1,137,222
Presented in person-working days	4,544	10,917
Presented in community expenditure	N$118,144.00	N$283,850.00
Concrete works		
Culverts to be constructed	49	25
Prefabricated lintels to be constructed	2,200	1,200
Material to be excavated (m^3)	700	240
Concrete to be cast (m^3)	472	270
Person-working days to be created	3,600	2,880
Presented in community expenditure	N$93,600.00	N$74,8800.00
Other community expenditure		
Compensation	N$21,333.21	N$41,539.30
Materials and consumables from local businesses	N$1,828,603.00	N$5,361,253.00
Supervisors and operators	N$686,315.00	N$1,105,447.00
Total community expenditure upon completion of contract		
Person-working days created	30,750	96,315
Community expenditure	N$3,335,751.00	N$9,012,429.00

SOCIO-ECONOMIC BENEFITS

Table 4: Key benefits of roads upon their completion

Benefit	DR 3644: Ompundja to Eheke	DR 3645: Onyaanya to Onanke
Travelling time		
Before construction	±45 minutes	±2 hours 30 minutes
After construction	±20 minutes	±45 minutes
Traffic volumes		
Before construction (ADT)[1]	56	85
Estimated diverted/attracted	150%	50%
After construction (ADT)[1]	Still to be counted	Still to be counted
Employment opportunities created[2]	30,750	96,315
Regional economy boost	N$3,335,751.00	N$9,012,429.00
Schools serviced by road	3	10
School pupils benefiting from road	1,480	3,500
Clinics serviced by road	1	3
Patients benefiting per day from road	30	100
[1] ADT = Annual Daily Traffic [2] Person-days		

With regards to the regional economic boost, the Plant Contractor and each SMME had to submit on a monthly basis detail of their expenditure within the local economy. Spending was mainly on labour, fuel, materials, equipment and the leasing of tractor and trailers from the community. The Consultant had to analyse this data in quarterly reports for submission to the RA and KfW. This was used as indicators to assess the overall objective of the funding agreement between KfW and the RA.

The roads became an "activity corridor" travelling from home to school, clinic and community centres. During the rainy seasons when large areas were flooded, long detours had to be taken to reach nearby destinations. The road provided an "all weather" direct route.

EVALUATION OF METHOD

To put the success of this method into perspective it was compared with experiences of labour based projects and managing small-scale enterprises.

According to WB Thawala (2006)[1] the original emphasis of a labour based project was the creation of employment opportunities for unskilled labour. However, it became clear that, to use labour more productively, it became necessary to train the supervisors technical and organisational skills. The RA method focused training specific skills for SMMEs and made it a prerequisite for tendering.

In his study of "Causes of Small Business Failure in Uganda" C Tushabomwe-Kazooba (2006)[2] has identified the following as some of the main reasons: lack of business plan, lack of capital and pricing. The RA has addressed this in their method by structuring the contract in such away that each SMME had its own contract, and a partnership agreement with the plant contractor. This enabled them to approach financial institutions for bridging finance. The training specifically included how to price a tender and how to monitor expenses in relation to work performed. The upkeeping of the systems were monitored on a monthly basis during implementation. By addressing the known reasons of failure the RA could ensure success, which was indeed experienced.

CONCLUSIONS

This was the first contract situation where this specific contractual arrangement was used. With the combined effort of all parties involved, it proved to be extremely successful. The following can be pointed out as definite highlights:

- The SMMEs confirmed that they now had a much better understanding of contracting.
- All bridging fund loans were released, and SMMEs built up a good credit record.
- The SMMEs made a profit, thereby gaining a sense of the importance of controlling contract activities and expenditure.
- A larger amount than expected was reinvested into the local economy.
- The local community, besides being able to take advantage of the job opportunities on offer, benefited directly from the improved accessibility presented by the road.
- Development took place along to the road.
- Construction of the Regional Council office commences in July 2008 when the first section of road was opened. The construction was delayed due to due to poor access condition. i.e. only sand tracks.
- Most of the SMMEs seem to have been accommodated in the next two labour-based contracts given out by the RA.
- Much was learned from the first project, and this has been used to refine future contracts.
- A closing down seminar is planned in 2009 for all involved. The purpose would be to create a forum where this method could be critically reviewed, with the aim of making positive recommendations to refine the method.

REFERENCES

1 WD Thawala, "Urban Renewal through Labor-Intensive Construction Technology in South Africa: Problems and Potentials" African Studies Quarterly 8, no.4: (2006)

2 C Tushabomwe-Kazooba, "Causes of Small Business failure in Uganda: A Case Study form Bushenyi and Mbarara Towns" African Studies Quarterly 8, no.4: (2006)