ADDRESSING THE TECHNICAL CAPACITY CONSTRAINTS ON COMMUNITY-BASED LABOUR INTENSIVE ROAD PROJECTS – A CASE STUDY OF THE AMADIBA ROAD PROJECT

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Amadiba Road is a 44km-long gravel road, which runs from the R61 between Port Edward and Bizana, down to the sea. It was a community-based, labour-intensive project managed by CSIR Built Environment, with funding from the national Poverty Alleviation Fund, through the South African National Roads Agency Limited. The project began in January 2002 and was completed in September 2003.

All the work was done by unskilled or semi-skilled community members, including the building of low-level bridges. Construction management was entrusted to selected local community members who with training have developed to the stage where they can become competent contractors. The project was overseen by a steering committee set up to include mainly members of the local community.

The technical training was commissioned during various stages of the project and allowed the trainees to receive hands-on experience during the construction process. This was aimed at enhancing their ability to manage the maintenance of the road, and to undertake projects other than roads.

Haulage of gravel was entrusted entirely onto local providers of tractor/trailers or trucks. The income enabled them to upgrade their equipment and to look for more work of similar nature.

Three years on, this paper investigates the skills transfer and capacity building initiatives of the project and will report on the current state of the community.

1. INTRODUCTION

The construction of roads using a high component of labour and relevant techniques to promote employment and address issues such as poverty eradication, local capacity and overall socioeconomic development is well documented. In many of the rural and deep rural areas problems are inevitably encountered when seeking adequately educated and skilled personnel from the local community. A challenge exists for project implementation teams, to provide adequate knowledge, skills and training to the targeted local people. The skills transferred to individuals must provide empowerment to be used elsewhere or to start ventures of their own.

On the Amadiba Road Project it was found that the level of education of most of the people involved in the project was low. Apart from a few skilled and semi-skilled people most of the people employed were unskilled, at the time were jobless and many etching out a subsistence living. During the project planning a time and budget allocation was made for the training. This culminated in the development of a structured training programme which coincided with the construction programme.

2. PROJECT BACKGROUND

Amadiba Road is a community-based, labour-intensive, 44 km long gravel road in the eastern corner of the Eastern Cape. The road begins on the R61 (Bizana/Wild Coast Casino main road) and ends near the Mtentu River mouth. The area is one of unspoilt natural beauty and plant life, being in the Pondoland Centre of Endemism, so special care had to be taken not to affect the environment. The design thus had to be sympathetic to this and of low impact. This was achieved in the project by paying special attention to drainage and avoiding the cuts and fills common to conventional construction which have caused degradation elsewhere.

An NGO operating in the area asked the CSIR for assistance in addressing the peoples' need for a road. The CSIR approached SANRAL for funding, which came from the national Poverty Alleviation Fund. The construction cost of the 6 metre wide road including wages, materials and plant and site overheads was R 198 000 per km excluding VAT. (Little & Lachman, 2004)The project was a difficult one which needed a certain amount of innovation, especially in the areas of contract type, causeways and drifts.

The project management costs proved to be higher than expected primarily because of the increased community liaison required for this type of work. The CSIR fee together with the environment consultant and social consultant costs was R 33 400 per km. The formal training costs amounted to R150 000 with CSIR also providing informal training and mentoring.

The wage rate was R30 at the beginning of the project and this was raised to R35 after one year. Task-work was used throughout the project where possible. Of the total funds spent on construction 55% were spent on wages, 5 % on local goods and services and a further 20% was spent on local haulage contractors. This meant that 80 % (or R6.3 million) of the funds stayed in the area with the consequent multiplier effect.

3. AIMS AND OBJECTIVE OF THE PAPER

The main aim of this paper is to discuss the technical capacity constraints experienced on the Amadiba Road Project and to outline the measures taken to address them. Some of the objectives of this paper are to:

- Highlight the socioeconomic status of the community
- Highlight the capacity needed on the project
- Discuss some of the capacity building issues
- Highlight the current state of the community

4. SOCIOECONOMIC STATUS OF THE AMADIBA COMMUNITY

Prior to the project implementation, a study was undertaken to determine the status and plight of the Amadiba Community. The project is situated in the Bizana Local Municipality and falls under the jurisdiction of the Wild Coast District Council. It is listed as the poorest Council area in the entire country (Statistics South Africa,

2000), with an imputed mean monthly household expenditure of only R862. The average recorded for the Eastern Cape was also the lowest provincial average at R1702.

The Bizana Municipality Integrated Development Plan (Bizana Municipality, 2002) indicates that the municipality has a population of 235326 persons. The area is 2806 square km and the population density is 84 per square km. The number of persons between the ages of 20 to 60 is 33% of the population. Unemployment measured in 1999 was 75,6%. The number of households which earn less than R1500 per month is 91,4%, and 33,4% of the households have no income at all. The Human Development Index is 0,42 which is below the average for the province.

It can be seen that the area was ideal for an employment creation project. The ward in which it took place has a population of 15542. In terms of government regulations persons under the age of 18 and over 60 may not be employed. The number of people eligible for employment was thus approximately 5900, and of these approximately 75% or 4425 were unemployed. The project employed a total number of 1700 which is 38% of the unemployed. At the peak of construction, the workforce was 460 local people. It can be seen that such a project had a huge impact on such an area.

Seeing that this was one of the poorest communities, it made an ideal candidate project for poverty alleviation to:

- provide all weather road access to the Amadiba community from the blacktop road especially to schools, clinics, and pension pay-out points
- provide as many construction employment opportunities to local people as possible
- transfer construction skills to the community
- encourage local business, contractors and suppliers
- build the capacity of the local community to manage road projects and maintenance thereof

5. TECHNICAL ASPECTS OF THE PROJECT

5.1. Community Based Labour Intensive Construction

To meet the project goals of employment creation and poverty alleviation in an impoverished area, the ideal method for construction was to use labour intensive techniques. The project was geared to using only local labour and to procure local goods and services where possible. Local tractor-trailers and trucks were employed to haul gravel from the borrow pits.

5.2. Construction of the Road

The project involved the construction of a 5.9 metre wide road (5.0 metre gravelled) along the existing track with minimal changes to the vertical and horizontal alignments. Minor drainage works to reinstate or stabilize washouts and deal with localized road drainage were provided. Single lane low level causeways across rivers and streams were also constructed.

The alignment was chosen to follow the existing track but kinks and sharp bends in the road were realigned in order to improve comfort and safety. Labourers used hoes, spades and axes to clear vegetation from the work area. Each labourer was given a piece of land to clear and this task normally took five to six hours to complete.

Formation building was the main activity of the labour force (Figure 1). Labourers were divided into teams of five people and were given the task of building 11.25 metres of formation per team. This included the simultaneous digging and shaping of the side drain(s) and the achievement of a camber of 11%. This task was controlled by the use of templates. The earth was not compacted by machine but the local drivers were encouraged to assist by varying their wheel tracks.

5.3. Gravelling

Local haulage contractors were found for the gravelling. Some had tractor/trailers and some had flat trucks. Although some of the vehicles were in poor condition there was no adverse affect on this project. Volumes varied from 1.5 to 7.0 cubic metres. The most successful contractor had a 4 cubic metre flat truck. Twenty-one vehicles were available so when one broke down it could be replaced. The hardest part of supervising this type of project was ensuring that the contractors were carrying full loads, and checking that the number of loads delivered had not been inflated.

Figure 1. Labour Force Constructing the Road Formation

5.4. Drainage

Erosion checks were placed in the side drains to slow down water flow and deposit silt. Substantial use was made of drifts on the project as they were much cheaper than pipe culverts. They carry much more flow and are easier and quicker to build. Also, pipes would have required fill to be brought in to cover them. A total of 64 drifts were built in the 40 km. The drifts have the desirable effect of reducing the speed on the road as they act as inverted speed bumps. In general they were 20 m long with the middle 15m being concreted. The concrete is placed in a grid of geocells which creates a concrete block pavement of uniform thickness. The longitudinal section consists of two s shaped curves with a flat bottom in the middle.

Where the terrain allowed, a few pipe culvert structures were built. Technical training was given to the construction management team on site, together with a few other local people selected by the Project Steering Committee. Training comprised modules for the laying of storm water pipes and building of head-walls and wing-walls.

5.5. Causeways

The project called for 1 major and 2 minor river crossings. The limited budget suggested vented, low-level causeways suitable for construction by labour intensive means. A reinforced concrete arch causeway design was chosen and was built entirely by semi-skilled local labour (Figure 2). The causeway was anchored down by means of dowel bars set in holes drilled into the rock base. The causeway was 5.25 m wide and it was cast in sections 2.3 m long, each containing an arch. The arch diameter was 1.9 m. The arch was formed on purpose made steel moulds.

Figure 2. Construction of Causeway by Local Semi-skilled Labourers

6. CAPACITY BUILDING ON THE PROJECT

6.1. Selection and Training of a Construction Management Team

All work was to be done by local people. The major components of construction required unskilled labour. Although this work was of a basic and manual nature all workers had to have some training to perform the work adequately. The process followed was to train team leaders or supervisors on these aspects of construction. These supervisors would then impart their knowledge on the workers. The supervisors were tasked with performing this basic training and to also supervise labourers thus ensuring production, quality of work and safety on site.

The key to making the project work was to employ local supervisors who had the necessary skill and education to perform their roles adequately. From consultation with social consultant, sample interviews and assessment by CSIR professionals a skills audit of the local community was carried out.

The skills audit revealed that seven people were suitable to fill the position of supervisors. Their ages ranged from 25 to 41. Of these, three had passed Grade 12 and the rest Grade 10. Two of them had been to technical college; one had an N4 certificate and the other an N3. All had work experience of different types. These seven people (all males) together with a local female clerk were employed on the project and formed the local construction management team (Figure 3).

There was however no single person in the local construction management team who was best profiled to undertake the role of construction manager to oversee the entire project. To this end an external experienced training officer was appointed as a temporary construction manager. His duties were to manage the supervisors and clerk and to impart his knowledge on the supervisors. It was envisaged that with the interaction of the training officer and supervisors there would emerge a supervisor who would gain enough knowledge and experience to be promoted to construction manager thus replacing the training officer. This was achieved during the course of the project and the local construction manager was able to successfully manage the project under the guidance of the CSIR.

Figure 3. The Local Construction Management Team

Before construction commenced the supervisors were trained by the CSIR to perform the construction activities of the project. This entailed the supervisors constructing a trial section of road. They were trained in the activities of route alignment, setting out, side drain and formation building, reshaping and general management of works on site.

Other important construction activities like gravelling, borrowpit rehabilitation, drift construction and erosion protection were demonstrated to the supervisors by the CSIR during the construction phase of the project. Accredited technical training was given to the construction management team on site, together with a few other local people selected by the Project Steering Committee (PSC). Training comprised modules for the:

- laying of storm water pipes,
- building of head-walls and wing-walls,
- constructing sub-surface drains,
- steel fixing
- erecting formwork,
- concrete batching and placing,
- gabion installation,
- stone masonry construction,
- small plant operation and
- entrepreneurial training

The technical training was commissioned during various stages of the project and allowed the trainees to receive hands-on experience during the construction process.
It was originally planned to put the local construction management team on a contractor development course at the end of the project. However the regulatory framework changed and the cost of such a qualification bearing course had tripled. They therefore only received part of the course.

The other type of emerging contractor on the project was the haulage type contractor. A total of 21 haulage contractors were used - all of local origin. Many of them were local tractor and trailer owners, some having trucks. They have made good money and many of them have upgraded their vehicles. To date no effort has been made to educate these contractors further.

Having the community take ownership of the project was a key factor to the success of the project as this motivated the people to work hard and to produce a good quality road that was completed within budget and within the prescribed period of time. This was achieved by forming a Project Steering Committee (PSC) that

comprised local community stakeholders and leaders. The project became the responsibility of the PSC, under the expert guidance of the CSIR. This met the aim to build the capacity of the local community to manage road projects and the maintenance thereof.

6.2. Capacity Building Issues

A number of problems around capacity building surfaced during the project. While some dealt with the policy requirements for Special Public Works Programmes, others centred on local and cultural conditions.

In the selection of the construction management team, the CSIR chose the most suitable local people to form the team. This was following the skills audit conducted. The CSIR's decision was based solely on the educational and technical experience of the candidates. The local PSC members however questioned the selection of some of the team members. Their concerns were based on the candidate's social and political standings. After much deliberation the CSIR convinced the PSC that it was in the best interest of the project to employ candidates solely on the basis of their educational and technical experience.

When employing the local people to perform the unskilled or manual tasks the procedure was for the supervisors, under the guidance of the CSIR, to provide the basic training needed by the labourers to perform the tasks. Local traditional boundaries resulted in 5 different areas of work. This implied that people from one area were not allowed to cross over and work in another area. What this entailed for the project was increased management hours spent on:

- recruiting new labour for each of the 5 areas
- opening bank accounts for people within each area
- training people from each area, and
- supervising the different groups of people

A stipulation for a Special Public Works Programme was that for every 22 days of work by a labourer there was to be 2 days of training provided (Department Of Labour, 2002). Of this 2 days of training 30% was to be accredited training. While there was unaccredited on-the-job training by the construction management team and the CSIR, the requirement of 30% accredited training implied that there would be a disruption in the work programme to provide this training. In addition there was a cost implication not only in providing the accredited training itself but also paying trainees an allowance of 75% of their daily wage for each day of training. The funding for training on the project was inadequate to meet this requirement of a Special Public Works Programme.

In providing accredited training for the construction management team during the construction process necessitated the delegation of their supervisory functions while they were on the training courses. This was not ideal as it meant that inexperienced and unqualified people were burdened with the task of managing the construction work and the labourers.

As an overall obstacle to capacity building was the language barrier between the trainers, including the CSIR, and the labourers. In most instances this had to be overcome by the use of interpreters. This was not ideal as the interpreters were only local people and the intended message was not always conveyed accurately.

7. DISCUSSION

7.1. The Project on Completion

The Amadiba Road Project was completed in 2003 and was then hailed as a success. The local people who initially were sceptical about a road built by hand were very happy with the result. The road was officially opened by the Minister of Transport, Jeff Radebe, in 2004.

The project's aim of poverty alleviation was achieved by spending the majority of the project funds in the local community. The community gained an all weather gravel access road and were no longer cut off from the outside world. The project trained the construction management team and the local PSC members to undertake road building and maintenance projects.

7.2. The Current State of the Amadiba Road

The question of sustainability was to be addressed through the maintenance of the road. A maintenance scheme was planned to start immediately after the road was handed over. This did not materialise and there was no continuity of work for the community. The local construction management team of the project have had no guidance after the completion of the project and have failed to develop as emerging contractors.

The road has since deteriorated to a state of disrepair and is impassable in sections. The road is the responsibility of the Mbizana Municipality but they do not have funds to maintain the road. The initial investment of the project is going to waste and if no maintenance action is taken immediately all of the investment will be lost.

8. CONCLUSION AND RECOMMENDATIONS

A detailed skills audit must be undertaken in conjunction with the scope of works in order to determine exactly what skills are needed and what training is required. In this way an accurate costing of this component can be made. In addition, all government policy requirements with regard to training must be taken into account and budgeted for.

Training should be relevant to the project but must be structured so that the skills learnt can be applied across various fields. This will improve the chances of a person gaining employment. To make it easier for trainees to grasp concepts and become enthusiastic about learning, training should be in a local language.

It is best for trainees to receive on-the-job training but this must be programmed efficiently to ensure minimal disruption of work. Mentoring must form an integral part of the construction programme. Regular site meetings help to iron out problems and promote team building.

Road projects must be planned on a lifecycle basis with maintenance being a major component. There thus needs to be more funding in projects. Government needs to set up more support programmes for emerging contractors. Projects must not be done in isolation but must be structured around each other to provide continuity of work for emerging contractors.

9. REFERENCES

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