

Potential of labour-intensive Method of road improvement's contribution to skills development: A case in Bergville

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One of the benefits of employing appropriate technology in infrastructure improvement programs using a labour-intensive approach in the road improvement is skills transfer to local community members who take part in the initiatives. Labour-intensive infrastructure improvement methods strengthen the socio-economic capacity of populations living in the vicinity of on-going projects. The majority of community members who live in the Bergville area are faced by abject poverty. Bergville, as depicted in the poverty map of Kwa-Zulu Natal province, is considered to be one of the poorest rural areas in S.A. with 73% of the population living below the poverty line. The bulk of the road network in the area where Bergville is located is gravel surfaced, requiring frequent maintenance to allow the smooth flow of traffic. The main challenge in the area is the progressively being depleted naturally occurring gravel deposit used for occasional resurfacing. The re-gravelling exercise requires huge maintenance costs as the transportation distances increase. Unsealed gravel roads are subject to rapid deterioration due to traffic, climatic and terrain and other related conditions. In addition to that, dust pollution created by the gravel roads causes environmental degradation and poses health hazards to local communities living in the vicinity of the roads. Sealing of gravel roads using an appropriate design approach conducive to labour-intensive methods can contribute to the reduction of maintenance requirements whilst increasing benefits to the local economy. Various studies indicate that the approach can be economically justified in the long term, considering the life cycle costs of road networks. Upgrading of gravel roads to sealed surfaces using a labour-intensive approach can have an added advantage of involving community members. The community members can acquire skills in various fields of road construction-related aspects, previously disadvantaged groups can be targeted to enable them to compete in the labour market, which will ultimately lead to a decrease in poverty.

This paper is useful as it provides foundations for the author's further research and examines the contribution of adopting a labour-intensive approach in sustainable skills transfer and empowerment of community members living in the Bergville area. It lists the variety of skills developed and transferred, successes and challenges experienced in the process of the skills development exercise to those involved directly during project execution. It also states the impact in the community and then concludes with highlighting lessons learnt and makes recommendations for the further implementation of projects of similar nature.

Keywords: Skills development, Road upgrading, Labour - intensive method

INTRODUCTION

Labour Intensive Methods for Employment Creation: South African Context

Since 1994, the South African Government has launched a National Public Work Programme (NPWP) whose aim included employment and asset creation, as well as capacity and skills development (Mc Cutcheon 1999). The implementation of Ebusingatha Road complements the National objectives as that of NPWP but the question is how far as the project has done towards successfully addressing the skills development of Ebusingatha community.

Given the persistently high unemployment situation in South Africa, the Government launched the Expanded Public Works Programme (EPWP) in 2004, with the objective to provide essential services and infrastructure to disadvantaged communities, develop skills among the unemployed and create the much needed employment through the application of labour-intensive work methods. The EPWP is one of these government measures aimed at creating additional job opportunities through providing a combination of work opportunities and skills development.

The KZN Department of Transport being one of the implementing bodies that champion Labour-intensive interventions in the improvement and maintenance of the road network under its jurisdiction. Most activities, especially that relate to low volume roads, carried out by the department contribute to alleviation of poverty development and transfer of basic construction related skills to the members of the local community taking part in the road sector.

Statement of the problem

About 70 percent of the declared road network of KwaZulu-Natal province including the one in research area is of gravel which required to be properly maintained. There is scarcity of suitable gravel source, in many parts of the province resulting in high re-graveling costs, due to long haul distances and accelerated gravel loss from poor materials (Howard E Bennett et al).

In the past, road dust has only been considered as a nuisance factor. However, there is a growing awareness that the dust generated by vehicles on unsealed roads has significant environmental and social impacts in terms of health, safety and visual pollution and substantial economic impacts pertaining to the loss of road construction material, higher vehicle operating costs, reduced agricultural yields and increased building maintenance (D Jones, 2000).

The level of unemployment and poverty are extremely high in South Africa and are amongst the most pressing problems of the country. Investing in Labour-intensive Construction has considerable potential of redressing the high unemployment, reducing poverty, addressing the skill deficit of disadvantaged communities and

improving infrastructure (Thwala, 2009).

The total economically active population of Bergville (excluding children under the age of 15 and pensioners) is estimated to be 73 617, representing 54% of the total population. Only 12 533 people are occupied in formal employment, which is about 17% of the total population. The remaining 83% are unemployed. Approximately 73% of the total population living in municipalities have no formal income and rely on other informal sources of income. About 95% of people who live in town are low income earners of between R1 and R1 600 per month (Mthembu, 2012).

There is a high demand for improving access by constructing durable and cost-effective roads in order to provide sustainable infrastructure at affordable costs, while at the same time continuing to address of high unemployment, to overcome the unemployment by upgrade the standard of the disadvantage people through skills development. Lack of improved access is a sign of poverty. The adoption of labour-intensive contributes to skills development topping the underutilised potential. Utilise the output of the study in an expanded manner on the majority of unpaved roads based in Kwa- Zulu Natal. Address high cost associated with frequent maintenance of gravel roads and justify the need to upgrade gravel road to sealed surface with the additional objective of providing an opportunity of skills upgrade for the previously disadvantaged people so that they can compete in the labour market.

Labour- intensive verses equipment-intensive

According to the International Labour Organisation (1999) comparative studies of employment-intensive vs. equipment-intensive projects have shown that the employment-intensive approach:

- has a higher absorbency of unskilled labour (direct and indirect employment);
- improves income distribution;
- contributes to an increase in household income and consumption, thereby leading to an increase in national income;
- saves foreign exchange and thereby does not increase debt;
- is based on demand from the community level, and thus enhances democratic participation;
- is more cost-effective in low-wage labour surplus economies; and
- Is more environmentally friendly.

Background of Ebusingatha road

Ebusingatha Road is nestled in the UKhahlamba Municipality in the Bergville which is situated in the foot hills of the Drakensberg Mountains, at KZN province of South Africa. Ebusingatha road passes close to Ebusingatha clinic, schools and community which were generally impassable particularly during inclement weather. Through observation and discussion before the upgrading of the road, the following issues among others were raised as serious concerns:

- In inclement weather, the road was virtually impassable. This means that the two schools, one clinic and shops were completely cut off. Given that South African schools term begins during the rainy season in the beginning of the year, the timely delivery of education material and delivery of medicines to the clinic would often not be guaranteed.
- Communities would be cut off, or been dropped off at the junction to the main road which is difficult for the adults to walk to the transport and walk back home.
- Emergency services would not reach the area
- Due to this lack of reliable and efficient access to Ebusingatha communities, the living conditions deteriorated and development prospects degenerated with the community generally losing hope for a better life.

Labour-intensive construction benefits

One of the benefits of employing appropriate technology in infrastructure improvement programs using a labour-intensive approach in the road improvement is skills transfer to local community members who take part in the initiatives. The methodology applied lends itself to the participation of members of the community as it mainly relies on the utilization of basic skills available rather than sophisticated and complex methods. This allows for the selected workers who are attached to some of the works that require basic skills in practice to start as assistants before becoming full-fledged artisans feeding for them by being potential employees in projects of similar nature in neighbouring areas or be involved in the maintenance of improved infrastructure in which they part of. Labour-intensive infrastructure improvement methods strengthen the socio-economic capacity of populations living in the vicinity of on-going projects. They assist in building up skills and empowerment by allowing them to take part in several activities related to road building, drainage structures, construction of foundations and brick or masonry walls etc.

The pilot project at Ebusingatha was done to address the following objectives:

- To find an alternate source of material that will address the scarcity of suitable gravel material for the construction and maintenance of road; To construct an all-weather surfaced road;
- To provide short-term employment for local residents through the use of labour-intensive methods of road construction, thereby reducing the high rate of poverty and unemployment;
- To target women, youth and disabled within the community in employment creation;
- To maximise the use of local materials and plant owners as suppliers of goods and services;

- To develop the skills through the training of local residence in road construction and supervision techniques.

The impact of labour intensive pavement construction on Ebusingatha communities

- Increased social benefits (more reliable access to schools, clinics, etc.)
- Reduce adverse environmental impact and health and safety(dust pollution affecting human and plant healthy)
- Decrease maintenance cost
- Employment creation and poverty alleviation
- Skills transfer to workers
- Optimizes the use of local resources

List of activities on Ebusingatha road construction

<i>Infrastructure type</i>	<i>List of Activities</i>	<i>Skills required/applied</i>
Road	Formation	Setting out, Slotting, leveling & Compaction
Road	Side Drainage	Setting out & using of profile
Road	Ultra-Thin Concrete Reinforce Pavement	Shuttering, Steel fixing, concrete mixing, Concrete laying, compaction, slump test and concrete cube preparations
Road	Pipe laying	Setting out, Opening trench, Laying and compaction.
Road	Headwall & Apron Slab	Setting Out& Building Skills.
Road	Stone Pitching	Setting Out& Building Skills.
Road	G4(Sub-course layer)	Setting out, Slotting, Leveling, processing, Compaction & Slushing
Road	Prime application	Applying rate
Road	Gabion Construction	Stone collection, Basket fixing& stone laying
Road	Slurry Seal Batching & Construction	Shuttering, Mixing, Laying, leveling& compaction

Some pictures of Labour-intensive construction



G4 (Sub-course Construction)



Slurry Seal Pavement Construction



Ultra Thin Reinforce Concrete Pavement



Stone pitching Head walls



Drainage



Gabions

Lessons learnt and challenges

Challenges

From the view of some on-going Ebusingatha labour- intensive pavement construction, the following challenges are encountered.

- Lack of proper documentation of tested methods,
- buying-in to the labour-intensive method at policy-making level
- An easy and handy reference guide
- And training in improved methods.
- Lack of labour-intensive pavement construction experience in Technical team.

Lessons learnt

There is a need for the proper documentation of tested methods and an easy and handy reference guide so that at the policy-making level can buy-in on labour-intensive pavement construction methods.

The application of the correct method and procedures would contribute towards removing the bias existing towards the use of labour- intensive pavement construction methods.(Thwala, 2006)The implementation of well-thought out programmes can have an important impact on the development of the economic and social situation in South Africa.

Recommendation& Conclusions

It is recommended that there is a need of the constructing durable and cost-effective roads in order to provide sustainable infrastructure at affordable costs, while at the same time continuing to address challenges such as lack of skills, high unemployment and poverty.

The experience shows that with well-trained site supervisory staff and an appropriate employment framework; labour-intensive methods can be successfully applied for certain types of infrastructure works without increasing costs or compromising quality.

At the completion of an labour- intensive pavement construction the report must be produced on;Evaluation of attained quality against required technical specification, Construction modality and process, Cost benefit analysis and productivity Lessons learned and General guidance on possible replications with improvements.

Unemployment touches everyone's life, labour-intensive construction is creating temporary work opportunities for the unemployed, and particularly the unskilled which they learn a new skill to enter the formal labour market and play role in the growth of the economy.

It also recommended that the uses of labour-intensive pavement construction be taken as a tool that could be used towards supporting skills development, poverty alleviation and reducing unemployment in KZN province. Access to work is the surest way out of poverty and there are no workers' rights without work. Moreover, getting people into productive activities is the way to create the wealth that enables the achievement of social policy goals.

Upgrading of gravel roads to sealed surface using labour-intensive approach can have an added advantage of involving community members through which they acquire skills in various field of road construction related aspects previously disadvantaged groups can be targeted to enable them compete in the labour market which will ultimately lead to the decrease in poverty.

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