LABOUR INTENSIVE PROJECTS IN SOUTH AFRICA

Submitted in fulfilment of the degree BSc (Hons) Quantity Surveying

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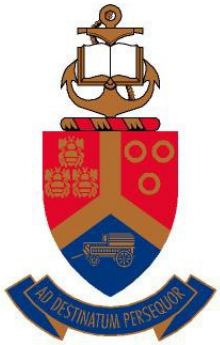

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October 2010

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October 2010

Declaration by student

I, the undersigned, hereby confirm that the attached treatise is my own work and that any sources are adequately acknowledged in the text and listed in the bibliography.

Signature of acceptance and confirmation by student

Abstract

Title of treatise : Labour Intensive Projects in South Africa

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Date : October 2010

The past legislation led to the result that a large portion of our population did not acquire the skill nor had the opportunity to effectively participate in South Africa's economy and to earn a living. The government created a public works programme to help previously disadvantaged people to learn to acquire skills and to attribute to the economy of South Africa.

The objective of this treatise is to identify and improve the current way labour intensive projects are handled and managed. The purpose will be to make recommendations to the municipality and their team that are involved in labour intensive projects about how to set construction project objectives, and point out negative aspects of the current and previous projects. Another method is the critical analysis of key factors that made previous projects a success.

Contents

CHAPTER 1: The Implementation of Labour Intensive Building Projects In South Africa 1
1.1 Introduction to Labour Intensively 2
1.2 Identifying the Problems Relating To Labour Intensive Projects 3
1.3 Main Problem 3
1.4 Sub-Problems 3
1.5 Hypothesis of Sub-Problems 4
1.6 The Importance of the Study 6
1.6.1 Primary Objective 6
1.6.2 Secondary Objective 7
1.7 Research Methodology 7
1.7.1 Literature 7
1.7.2 Interviews 7
1.7.3 Consultation of Professionals 7
CHAPTER 2: The Characteristic Of Time In A Labour Intensive Project 8
2.1 Introduction 9
2.2 The purpose of analyzing time in labour intensive projects 9
2.3 Problems identified in projects that lead to late completion 9
2.4 Contract Requirement 10
2.5 Ways to counter delays and late completion 11
2.6 Labour intensive methods influencing time in a building project 14
2.7 Comparing labour intensive workmanship with normal construction machinery 16
2.8 Summary 18
2.9 Hypothesis 18
2.10 Conclusion 18
CHAPTER 3: The Characteristic Of Cost In A Labour Intensive Project 19
3.1 Introduction 20
3.2 Funding of Labour Intensive Projects 20
3.3 Different phases of Labour Intensive Projects with cost implications 21
3.3.1 Tender procurement 21
3.3.2 Labour intensive Bills of Quantities 22
3.3.3 Construction Phase 25
3.3.4 Training 26
3.4 Labour intensive costs compared to Traditional Contraction projects 27

3.5 Employment Opportunities 29
3.6 Cost Retained by the Community 29
3.7 Summary 30
3.8 Hypothesis 30
3.9 Conclusion 31
CHAPTER 4: The Characteristic Of Quality In a Labour Intensive Project 32
4.1 Introduction 33
4.2 Sustainable Development 33
4.3 Community-based Construction 35
4.3.1 Conventional approach to construction of services 36
4.3.2 Barriers to entry 36
4.3.3 Development support required for emerging contractors 37
4.3.4 The Development Team Approach 38
4.3.5 Support provided by Construction and Materials Managers 39
4.3.6 Risk to the Client 40
4.4 Public works Infrastructure and Maintenance in South Africa 41
4.5 Summary 43
4.6 Hypothesis 43
4.7 Conclusion 43
CHAPTER 5: What Are The Positive Outcomes Of Labour Intensive Projects? 45
5.1 Introduction 46
5.2. Infrastructure and Employment Creation 47
5.3 Labour-Intensive Approach 49
5.4 Overview of African Experiences through the use of Labour-intensive approach in Infrastructure Programmes 50
5.5 Housing Problem in South Africa 53
5.6 Current Employment through Extended Public Works Programme 54
5.7 Employment Potential in the Process of Housing Provision 55
5.8 Training 57
5.9 Summary 57
5.10 Hypothesis 58
5.11 Conclusion 58
CHAPTER 6: Conclusion 59
6.1 Background 60

6.2 Summary 61
6.3 Conclusion 62
6.4 Suggestions for further research. 64
BIBLIOGRAPHY 65

List of Tables

Table 1: The Ideal Construction Programme 16
Table 2: Example of hourly work of a normal labourer 17
Table 3: Scoring procurement preferences 22
Table 4: The success rates of different provinces in South Africa regarding Job creation 54

List of Figures

Figure 1: Combination of the critical legs of a construction project 5
Figure 2: Typical Labour Intensive Bills of Quantities 24
Figure 3: Training in the Bills of Quantities 26
Figure 4: Number of work opportunities created in the Infrastructure Sector 55

CHAPTER 1: The Implementation of Labour Intensive Building Projects In South Africa

1.1 Introduction to Labour Intensively

The past legislation led to the result that a large portion of our population did not acquire the skill nor had the opportunity to effectively participate in South Africa's economy and to earn a living. The government created a public works programme to help previously disadvantaged people to learn to acquire skills and to attribute to the economy of South Africa.

The public works programme involves creating temporary, and in some cases permanent work for unemployed using public expenditure. The following was the first public announcement of the implementation of the public works programme from the previous president Thabo Mbeki in February 2003 "to address this investment in social infrastructure, the government has decided that we should launch an expanded public works programme. This will ensure that we draw significant numbers of the unemployed into productive work, and that these workers gain skills while they work, and thus take an important step to get out of the pool of those who are marginalised."

According to the minister of infrastructure in the public works sector, most of the unemployed are unskilled people and the emphasis is on relatively unskilled work opportunities. All of the work opportunities generated by the Extended Public Works Programme are therefore combined with training, education or skills development, with the aim of increasing the ability of people to earn an income once they leave the programme. Together with the SETA's, the Department of Labour coordinates the training and skills development aspects of the programme.

"As part of the contribution to the income of the poor, the target for 1-million work opportunities through the Expanded Public Works Programme was attained in 2008, a year earlier than envisaged in the 2004 electoral mandate. This has created the possibility massively to expand this programme and improve its quality". (Sona; 2009)

One of the ways the government was able to successfully reach their goal of 1 million work opportunities was to implement labour intensive projects to further produce work to the government.

Today labour intensive projects and labour intensive tendering is a very common procurement method and most of the municipal contracts makes provision for this.

1.2 Identifying the Problems Relating To Labour Intensive Projects

In order to improve the current way labour intensive projects are handled, it is necessary to identify problems in the system and try and find techniques to fix these problems. A main problem will be identified followed by sub problems.

1.3 Main Problem

Will the implementation of labour intensive building project be successful or will it be regretted in the near future? Is there a silver lining surrounding all the negative aspects created by this government implementation?

At this stage the main problem is the uncertainty of realisation of projects and furthermore the success of these associated projects in the near future.

1.4 Sub-Problems

1.4.1 What impact do labour intensive projects have on?
- Time
- Cost
- Quality of the project

1.4.2 Is there efficient control and monitoring in the implementation of this programme?

1.4.3 What are the effects of giving responsibility to unskilled persons?

1.4.4 How can disadvantages be limited

1.5 Hypothesis of Sub-Problems

1.5.1 The three most common primary objectives in project management are lowest cost, highest quality and shortest time. Very often the gain in one of these objectives needs a compromise in the other.

"There are a number of problems in the construction industry caused by poor management, and the situation seems to be getting worse. Projects are frequently late, over budget and suffer from poor workmanship and materials. Conflict is increasing, resulting in litigation and arbitration with depressing regularity. The aesthetics of the built environment are subject to much criticism in the popular press, and this is often reinforced by more serious publications. All of these problems seem to arise from a lack of control and from the application of outdated ideas about the roles of professionals in creating a flexible, responsive and dynamic construction team" (Huges; 1991)

The hypothesis of this study is that a labour intensive construction industry will perform at its best and be accomplishable if the project achieves a balanced ratio between time, cost and quality of the building work. If a project suffers from one of the above mentioned aspects it will not be a successful project.

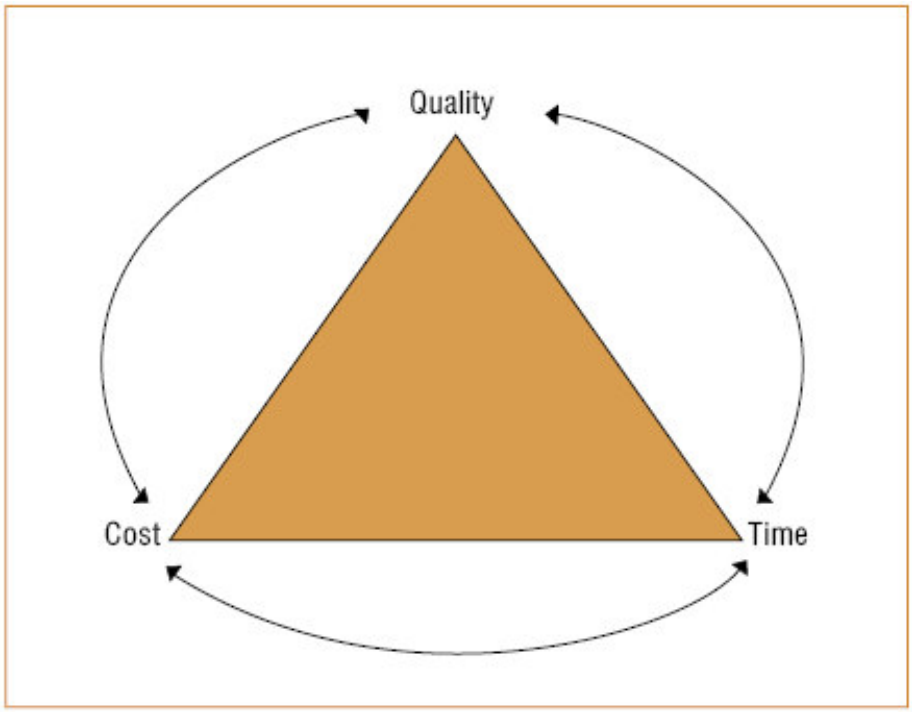
Methods are needed which will allow project, particularly the client(s) of the project, to identify objectives to steer and manage the project in the correct manner. "To achieve a balanced structure is intended to establish a technique for modelling the relationships between project environments, objectives, control systems and feedback in the construction process." (Huges; 1991)

The purpose will be to make recommendations to the municipality and their team that are involved in labour intensive projects about how to set construction project objectives, and point out negative aspects of the current and previous projects. Another method is the critical analysis of key factors that made previous projects a success.

Because labour intensive projects are fairly new in South Africa it is necessary to determine the factors that influence a typical labour intensive project. Factors influencing time, cost and quality in normal building projects can seldom be used in labour intensive projects as they are two completely different types of projects. "The physical environment dictates the technology which is available. Technology includes the physical resources being utilized in the

provisions of the built facility. This also ties in the ecological issues about the effect that the construction project has upon the physical environment. In terms of a control system, it is functional control which forms the strongest link here. The function of the building, and its parts, is a direct result of the technological task environment. This environmental factor is concerned not only with the technology of construction, but also the technology of the client's organization. Therefore, the function of the building, and the way in which the client's requirements are achieved, are essential elements of functional control. "(Banwell; 1964) From Banwell it is clear that labour intensive projects must be analysed in the environment that they operate in. Figure 1 indicates the three critical legs of a construction project.

Figure 1



(Guidelines to construction management good practice; 2006)

1.5.2 Are there enough control and monitoring of a typical labour intensive project?

For any project or new implementation it is vital to be pro-active involved in the progress to ensure a successful outcome.

Until now there are many factors that contribute to frustration in these projects. Strict rules set out for the benefit of previously disadvantaged people caused problems to the unskilled

contractors. The contractors are forced to use local community sub-contractors with little knowledge in their fields. Furthermore these sub-contractors struggle with cash-flow issues and can't keep up to their obligations when it is their part to produce.

A well structured system needs to be put in place to ensure a problem free project.

1.5.3 Projects are often awarded to unskilled contractors and they are required to produce a sustainable project. The unskilled contractors are still in the progress of learning and building up skill and are most of the time not capable of producing the project required of them.

The consequence of unskilled contractors being in charge of large project often leads to failure. Again a major contributor to this problem is cash-flow difficulties and not knowing how to handle finances, which is one of the most important aspects of a successful contractor.

1.5.4 In what ways can these disadvantaged be limited and eventually overcame?

One way of limiting disadvantages is by effective communication. The implementation of a Community Liaison Officer is provided to form a link between the main contractor and the various local sub-contractors. However this causes its own problems. In some cases the CLO and the main contractor had many differences on site. One example is that the main contractor is looking for sub-contractor to do the work for a decent price while the CLO looking for a sub-contractor that is currently unemployed and unskilled. Scenarios like these will be investigated and ways in which these problems can be solved will be discussed.

1.6 The Importance of the Study

1.6.1 Primary Objective

The identification of difficulties facing the implementation of labour intensive is very important so that pro-active steps must be taken to implement a positive project and successful outcome.

1.6.2 Secondary Objective

To determine possible techniques for improving labour intensive projects and providing a sustainable solution for successful projects in the future.

1.7 Research Methodology

1.7.1 Literature

- Electronic data
- Newsletter from the department of public works
- Articles

1.7.2 Interviews

Interviews will take place with contractors and project managers currently working in labour intensive projects.

1.7.3 Consultation of Professionals

Municipal manager(s) will be consulted and their insight on labour intensive projects will be analysed.

CHAPTER 2: The Characteristic Of Time In A Labour Intensive Project

2.1 Introduction

One of the most frequent problems of a labour intensive project is the fact that the projects do not complete in the given time. This causes much frustration in the industry. Time completion of a construction project is frequently seen as a major criterion for project success by clients, contractors and consultants alike. "There has been a universal criticism of the failure of the construction industry to deliver projects in a timely way. " (Newcombe et al; 1990) One needs to determine the cause(s) of these delays and find a way, if possible, to overcome the problem.

"A disciplined management effort is needed to complete a construction project on time, and that this concerted management effort will help to control both cost and quality." (Nedo; 1983) Thus, through efficient planning and management effort the client's objectives can be achieved.

2.2 The purpose of analyzing time in labour intensive projects

The main reason for identifying the aspect of "time" in the study is to determine the influence of time and the consequence that time, or a lack of time may have on a labour intensive project. It is important to determine the aspects where time management can be introduced or improved but also analysing the projects where time control were successfully handled and applied.

2.3 Problems identified in projects that lead to late completion

An example of a labour intensive project that did not complete on time is the project of constructing a community centre at Munsieville, a township bordering Krugersdorp. According to Pretorius (2010) form the Mogale City community services the project started off very seamlessly with no disruptions. However three weeks into the project the emerging contractor started having problems with his masonry subcontractor. Quantities of the

materials could not be finalised and the construction of the brickwork came to a standstill for approximately one and a half weeks.

Two weeks later the contractor started having problems with an excavator used to do the final excavations. As the problem could not be resolved the excavator had to be send to a plant repair service station. This created another week of work delayed due to a certain part of the construction site not suitable for carrying out the construction of brickwork.

During the course of the project the problems did not cease. Three quarters into the project the majority of the sub-contractors aborted work due to non payment. The main contractor did receive funding on time through the payment certificate but failed to set the balance of outstanding payments to his sub-contractors.

All of these factors led to a substantial delay in construction time. According to Pretorius (2010) the project was completed on the 31st of March 2010, four months after the planned practical completion date of 31st November 2009.

Despite of all of the delays the contractor was never penalised for late completion. According to Pretorius (2010) the main reason for not penalising the contractor was due to the fact that the Municipality decided that the contractor was classified as an emerging contractor and therefore he was not liable for any penalties.

2.4 Contract Requirement

This project, like most of the labour intensive building projects of South Africa made use of the JBCC building agreement. In the Principal Building Agreement it clearly states the circumstances under which the contractor is entitled to extension of time without compensation;

“The circumstances for which the contractor is entitled to a revision of the date for practical completion and for which revision the principle agent shall not adjust the contract value are delays to practical completion caused by one or more of the following:

- The adverse effect of weather conditions
- The inability to obtain materials and goods where the contractor has taken all practical steps to avoid or reduce such delay

• Making good physical loss and repairing damage to the works where the contractor is at risk
• An event that neither party could prevent, civil commotion, riot, strike or lockout
• Late supply of a prime cost amount item where the contractor has taken all reasonable steps to avoid or reduce such delay
• Default by a nominated subcontractor where the contractor has taken all reasonable steps to avoid or reduce such delay" (JBCC Principle Building Agreement; 2007)

When looking at the scenario of the delay of practical completion by the contractor of Kagiso community centre, it is clearly visible that the contractor is not entitled to a extension of time.

2.5 Ways to counter delays and late completion

According to Brain Moholo, managing director of social housing funding department, there are certain solutions to counter delays and late project completion;

• Evaluation and selection of sub-contractors with known reputation for good work(check references – do physical checks of work rather than telephonic confirmations)
• Levy penalties for late completion
• Insist on realistic and detailed programme of work
• Monitor progress regularly
• Order materials in good time and ensure work is not delayed because of materials shortages on site
• Re-schedule work when necessary. For example, it is good practice to wait until roofs are installed before plastering walls. If the roof is delayed, however, it may be necessary to plaster in the meantime, to keep to the programme, as long as the plaster is then protected against drying too quickly by applying moisture
• Confirming the availability of necessary resources

Nkado (2008) of the University of Witwatersrand wrote in an article the causes of construction delays that "There is no consensus in the literature on the identification of factors which affect stipulated, planned or achieved construction times of buildings. One reason for this is that researchers have largely viewed the subject from diverse prospective. Such viewpoints include identification of discrete factors which affect productivity on site and taking a systems view of the construction process and end product."

A list was created by Nkado (2008) to show the factors that have been traced to be the construction time influencing factors, with different weights assigned to them by each individual planner. These can be a very helpful guide to emerging contractors and the whole professional team involved in a labour intensive project.

“Factors pertinent to Clients

• Financial ability/ financial arrangement for the project

• Previous working relationship

• Category (Public, private)

• Priority on construction time

• Specified sequence of completion

• Possible changes to initial design

Factors pertinent to Consultants

• Completeness and timeliness of project information

• Build-ability of design

• Provision for ease of communication

• Previous working relationships

• Priority on construction time

Factors pertinent to contractors

• Availability of suitable management team given firm's current work load.

• Programming construction work.

• Previous performance of site management team

• No of sub-contractors

Factors pertinent to Contract Form

• Suitability to project time

• Use of standard form of contract

Factors pertinent to project conditions

• Function or end use (office, residential, industrial,...)

• Complexity

• Location

External Factors

• Weather

• Regulations

• Statutory undertakes”

According to Pretorius (2010), the employer is also responsible to lower the risk of late completion or delays. One aspect that is crucial is that the employer must clearly set the consequences if a delay occurs and set a penalty. This will encourage the contractor to finish the project in time.

Matt Stevens (2008) the writer of the Contractor's Business Digest gives a clear observation on management of time; “It is obvious, time management is important to your firm’s results. It is one of the few “controllables” in construction. All persons need to have superior skills in managing time.

Certainly, only a certain amount of hours is given to the most frugal time managers but the same amount is given to the spendthrifts. Controlling the use of that time can only help add to it. Spendthrifts never have enough time while the frugal seem to have enough.

There are many ways to look at time management. In construction, it should be viewed differently than other industries. In our business, leaders will spend more time with people while managers will spend the most time with processes.

All spend time with both people and processes. Understanding this distinction is the starting point to managing your time better.”

2.6 Labour intensive methods influencing time in a building project

One major influence that labour intensive projects will have on time is the use of manual or people labour rather than machine work, to create work for unemployed people.

This can make a substantial difference in the time frame of a project.

Moholo (2006) commented on the labour intensive aspects of time consuming construction activities; “Although the science of work study provides us with typical or average output rates for labour (labour constants or time it takes for one worker to complete a certain task) and plant (cubic metres of soil that can be excavated by an excavator in an hour or a day), it remains to apply that information in a sensible manner. If one worker takes three hours to excavate by hand one cubic metre of soil, it does not necessarily mean that 30 cubic metres can be done in the same time if 30 workers are simultaneously excavating soil.

There are many practical aspects to consider – what is the optimum size of a team doing excavations that will facilitate adequate supervision and control over productivity and quality, how many teams can practically be working on a limited site at any one time, how many suitably skilled workers are available to the contractor, what to do with surplus workers once a certain task is completed (can they be absorbed into other subsequent activities, or will the contractor have to retrench workers).

If the contractor owns one concrete mixer with a maximum daily yield or output of, say, 32m3, and it takes one worker 0.5 hours to place and level a cubic metre of concrete (maximum output of 16m3 in an eight-hour day), it would be pointless having more than two such workers on site while concrete work is being done. More workers will be required to transport raw materials from the stockpiles to the place of mixing, to operate and clean the mixer, and to transport the mixed concrete to the works.”

“Resources for activities in construction project are limited in the real-life world. So resource allocation is of great importance to construction project management to avoid the waste and shortage of resources on a construction project. This paper presents a genetic algorithm model for resource allocation. Compared to the traditional crossover methods, the proposed

model develops a new crossover operator to avoid producing illegal chromosomes. The model can effectively provide the optimum solution to resource allocation problem. An illustrative example is presented to demonstrate the performance of the proposed approach." (Agric;2005)

"Although work study provides us with average output rates, each project and each site is different, and as in cost estimating, we often have to apply adjustment factors or multipliers to the averages to account for specific circumstances such as:

Site gradient, size and shape – it takes longer to transport materials by barrow on steeper sites. Confined sites limit the number of plant and workers that can work simultaneously on a task or on different tasks

Nature of the work – it takes longer to place concrete in slender elements such as columns, as compared with bases or slabs

Climatic conditions – work is more sluggish early on cold Highveld winter mornings, or in the heat of noon at mid-summer. In certain parts of the country strong winds can have a real impact on resources at certain times of the year (requiring for instance more workers than normal to safely carry items such as roof sheets or ceiling boards)"(Moholo;2006)

Table 1 explains the ideal process that the contractor should follow to produce a product without a delay in completion.

Table 1

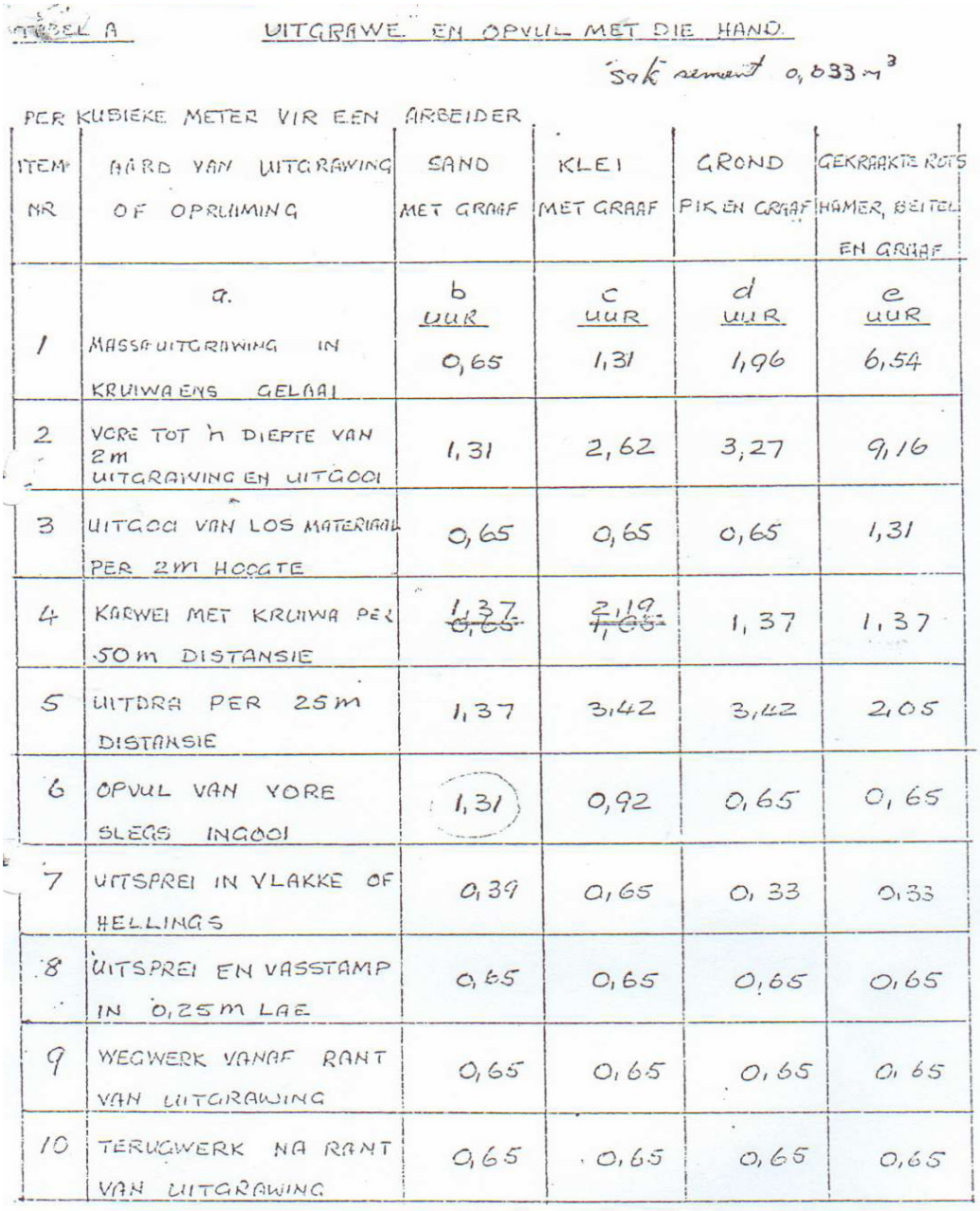
Activity No	Description	Duration (days)	Responsibility
010	Setting out	1	Site foreman
020	Excavate foundations	1	Specialist sub-contractors
030	Foundations	2	Specialist sub-contractors
040	Plinth Brick/Block work	2	Brick layer
050	Plumbing -1st Fit	1	Plumber
060	Electrical - 1st Fit	1	Electrician
070	Brick/Block work	9	Brick layer
080	Fitting of frames	2	Brick layer
090	Fixing of ties	1	Brick layer
100	Roof timbers	2	Carpenter
110	Roofing	2	Roofer
120	Beam fill	2	Plasterer
130	Plumbing 2nd Fix	2	Plumber
140	Electrical 2nd Fix	1	Electrician
150	Wall finishing	3	Plasterer/Painter
160	Fitting doors & glass	2	Carpenter
170	Finishing	4	Various
180	Inspectionss	7(split)	Various
190	Connections	1	Various
200	Hand over	1	Site foreman

(Construction management guidelines; Moholo; 2007)

2.7 Comparing labour intensive workmanship with normal construction machinery

According to statistics, collected from van Rooyen (2010), a main contractor at a project in Munsieville, an excavator would excavate fifteen cubic meters per hour of work. Table 2 clearly states the hourly work of a normal labourer. These statistics can be used to compare the time efficiency of an average labour intensive labourer.

Table 2



TABEL A — UITGRAWE EN OPVUL MET DIE HAND

Sak sement 0,033 m³

PER KUBIEKE METER VIR EEN ARBEIDER

ITEM NR	AARD VAN UITGRAWING OF OPRUIMING	SAND MET GRAAF	KLEI MET GRAAF	GROND PIK EN GRAAF	GEKRAAKTE ROTS HAMER, BEITEL EN GRAAF
	a.	b UUR	c UUR	d UUR	e UUR
1	MASSA UITGRAWING IN KRUIWAENS GELAAI	0,65	1,31	1,96	6,54
2	VORE TOT 'n DIEPTE VAN 2m UITGRAWING EN UITGOOI	1,31	2,62	3,27	9,16
3	UITGOOI VAN LOS MATERIAAL PER 2M HOOGTE	0,65	0,65	0,65	1,31
4	KARWEI MET KRUIWA PER 50m DISTANSIE	~~1,37~~ ~~0,65~~	~~2,19~~ ~~1,05~~	1,37	1,37
5	UITDRA PER 25m DISTANSIE	1,37	3,42	3,42	2,05
6	OPVUL VAN VORE SLEGS INGOOI	1,31	0,92	0,65	0,65
7	UITSPREI IN VLAKKE OF HELLINGS	0,39	0,65	0,33	0,33
8	UITSPREI EN VASSTAMP IN 0,25m LAE	0,65	0,65	0,65	0,65
9	WEGWERK VANAF RANT VAN UITGRAWING	0,65	0,65	0,65	0,65
10	TERUGWERK NA RANT VAN UITGRAWING	0,65	0,65	0,65	0,65

(University of Pretoria;2005)

From table 3 it is clearly visible that a machine operated excavator is far more productive than a person or even a group of people. The effect of cost compared between the two different options will be discussed in labour intensive cost analysis.

2.8 Summary

Labour intensive projects that have been identified in the current study shows that the majority of the projects did not complete in time or in the proposed construction period. This is due to many different reasons. Some aspects that is the cause of a time delay are forced upon the main contractor and there is little or nothing that he can do about it, however, many of the reasons for a construction delay is due to lack of management by the main contractor.

2.9 Hypothesis

Most of the labour intensive project ends in a result of late completion. This is due to many reasons. The government places many “rules” and requirements on the project to ensure a successful outcome. However, many of these requirements lead to a failure of the project especially late completion. Very seldom a contractor will take the responsibility of his actions and the blame gets send through the whole project team. If a clear and unambiguous guideline can be set up for emerging contractors, there will be less confusion in the project.

2.10 Conclusion

The hypothesis is correct. Throughout the study many reasons for delays in a labour intensive project came forward. One aspect remains certain; a labour intensive project creates much more room for error and if effective management is not in place, a project will end up months after the planned completion date.

Certain requirements cannot be bypassed, for instance the appointment of unskilled labour that must fill the shoes of heavy machinery. But through sufficient planning from the whole project team, a successful outcome is possible.

CHAPTER 3: The Characteristic Of Cost In A Labour Intensive Project

3.1 Introduction

In every construction project the cost of the project is a major factor. The client provide the funding of a project, and with that funding, the whole project must evolve. It is very important to evaluate the cost and funding throughout the project to avoid pit falls along the way.

"Clients have been increasingly concerned with the overall profitability of projects and the general accountability of projects. Cost overruns, in association with project delays, are frequently identified as one of the principal factors leading to the high cost of construction". (Charles and Andrew, 1990) "Research to date has tended to focus on the technical aspects of managing costs on construction projects in the attainment of client objectives. There is little evidence in the published literature of a concern for the organisational, social and political problems that are inherent in the management of construction costs and the ability of the project team to meet the client's needs in terms of cost." (Bowen, 2005)

3.2 Funding of Labour Intensive Projects

Labour intensive projects, unlike private projects, are funded through a municipality or a government grant, but most of the time both funding mechanisms are in place. According to the Extended public works programme's five year report, during 2003, the South African government decided to fund poverty relief through the normal budgeting process, rather than through a separate special fund with its own budgeting process. This decision was based on a review of poverty relief programmes, which determined that the separate budgeting processes for these programmes resulted in a number of quandaries, such as:

- Tensions in inter-government fiscal relationships (e.g. a school being built through a national poverty alleviation programme, but the recurrent costs of the school having to be met through the provincial government's budget); and
- Spheres of government becoming involved in work that did not form part of their constitutional core function (e.g. municipalities using poverty relief funds to build schools – ultimately a provincial function).

It was also decided that government departments should only carry out poverty relief programmes in their core functional areas. For this reason, the funds that had been allocated

to the DPW for the CBPWP were reallocated to the Department of Provincial and Local Government (DPLG) to form part of the MIG-allocations to municipalities.

3.3 Different phases of Labour Intensive Projects with cost implications

Because of the fact that labour intensive projects are still at an early stage of development, the most frequent question asked is, will it be financial viable in the long term.

Many conditions required by the steering committees of these projects make it often difficult to manage the finances and try to save money throughout the project.

3.3.1 Tender procurement

Even at a stage as early as the tendering procedure, cost implications on the project can be visible. When comparing a "normal" project to a labour intensive project, one clear aspect is the market that tenders on the project.

Tender procurement that is followed in a labour intensive project is similar to a normal tender but favours previous disadvantaged people and also contractors from local municipalities. According to Pretorius (2010), the enforcement of local contractors was installed after dissatisfaction of local residents and contractors. They were angry about the fact the other contractors commence work on their local grounds and "take" the work from them.

When using a 90/10 tender scoring calculation, ten of the procurement points will be allocated for preference aspects.

The table below will provide an example of the scoring procurement preferences and how they are calculated.

Table 3

No	Tenderer	HDI Ownership	Female Ownership	Disabled Ownership	Promotion of SMME's	Promotion Enterprise Gauteng	Promotion Enterprises	Promotion Enterprises Westonaria	Total
	Weighing	**2**	**1**	**1**	**1**	**2**	**1**	**2**	**10**
6	REALEKA INVESTMENTS SA (PTY)LTD	2	0	0	1	2	1	2	8
25	GT HOME BUILT AND BUILDING SOLUTIONS SA	2	0.5	0	1	2	1	2	8.5
33	KOPANO CREATIVE CONCEPTS CC	1	1	0	1	0	1	0	4
35	PAPARICH PROPERTY DEVELOPMENT	1	0.5	0.5	1	0	1	0	4

(VDW Quantity Surveyors standard tender documentation; 2009)

When using this type of procurement, a tender can be won on the above mentioned grounds but may not be the best contractor for the project. Thus it is also crucial to analyse the tendering company's profile and interview the previous referenced projects completed by the company.

3.3.2 Labour intensive Bills of Quantities

The contractor will use the Bills of Quantities as a guide to determine which activities in the project one will classify as labour intensive.

The labour intensive items in die bills will have a reference next to the item. Most of the time these are items which involves repetitive work that can easily be done by a labour force. Table 5 provides an example of a typical Bills of Quantities which include labour intensive items. The items classified as labour intensive is referenced as "LI" next to the item.

"The Contractor is fully responsible to find and manage the labour, materials and plant required to execute the works. Where it is specified that he must use labour intensive methods, it places the further responsibility onto him to find and train labour to dig trenches,

etc and he must price the project correctly to cover any additional costs. It is normally assumed that a labour-based approach will cost more than a plant-based approach, because of slower progress, etc."(Department of water affairs and forestry, SMME's presentation; 2001)

This is also a good way to incorporate the construction programme with the labour force. The contractor can easily mark labour intensive items early in the project, and be ready for implementation of the different teams when the specific item starts.

The contractor will work closely with the CLO (Community Liaison Officer) to involve the community in the project. The CLO is responsible to gather persons from the community to form part of the construction projects. A strong link between the CLO and Contractor is essential and with a lack of communication the project will suffer greatly.

According to Fenn (2010), a Principal Agent of a Consulting engineering company, the best way to implement and ensure success in labour intensive projects is good communication and a healthy relationship between the contractor and the CLO. For example, if the contractor knows that the brickwork will start in two weeks time, he must inform the CLO and provide him with the necessary information like the type of activity, number of labourers required and also the duration of the activity. Hereafter the responsibility lies with the CLO to ensure that the right amount of labourers are resourced and present at the right time.

Figure 2

		Brought Forward			R	
		EARTHWORKS (Buildings)				
		Excavate in earth below natural ground level, reduced or made up ground level, not exceeding 2m deep				
LI	1	Trenches	m3	10		
LI	2	Trenches for raft foundations beams	m3	39		
		Extra over bulk excavation in earth for excavation in				
	3	Hard rock	m3	7		
		Risk of collapse of excavations				
LI	4	Sides of trench and hole excavations not exceeding 1,5m deep	m2	389		
		Keeping excavations free of water				
LI	5	Keeping excavations free of water		Item		
		Earth filling obtained from the excavations and/or prescribed stock piles on site compacted in layers of 150mm to 95% Mod AASHTO density				
LI	6	Backfilling to trenches, holes, etc	m3	5		
	7	Sub-base course under floors, steps and paving	m3	72		
		Coarse river sand filling supplied by the contractor				
LI	8	20mm Thick under floors to receive waterproofing	m2	480		
		Carried Forward			R	
		Section No. 2 SECTION 2 Bill No. 1 EARTHWORKS				

(Labour intensive Bills of Quantities, VDW Quantity Surveyors;2010)

3.3.3 Construction Phase

During construction a labour intensive project must comply with certain rules set by the government. Unlike normal projects, labour intensive projects make use of the procurement structure explained in previous text but some of these aspects carry on during construction.

One major characteristic of a labour intensive project during construction is that it must make use of local labour and also local subcontractors. This can have a major influence on the cost of the project.

When a subcontractor must be selected, the municipality requires three or more quotations from different subcontractors to safeguard the tendering process. But, one main requirement is that these subcontractors must be from the local municipality.

According to Pretorius (2010), project manager from the Mogale City district, local labour subcontractors do many times have a negative impact on the cost of a project. When looking at an example of a project in Munsieville, three quotations were needed for the installation kitchen cupboards and shelving. The problem came when only one kitchen fitter was located in Munsieville. Two more quotes were received by subcontractors outside of the local municipality with more inexpensive quotes, but due to the fact of local labour, the Municipality appointed the more expensive subcontractor. Pretorius (2010) also states; “the problem continues as the local subcontractors now have an easy way into local projects and abuse the opportunity as they regularly increase their prices and rates to gain more profit from the projects.”

Another example of local labour influencing the cost of the project was one scenario of a CLO unlawfully appointed a plumber who was also his brother in law. The plumbing subcontractor made an agreement with the CLO, by giving him a certain amount of the profit if he were to the appointed to the project.

3.3.4 Training

In a labour intensive project the contractor makes use of labour from local municipalities, and therefore many times these people have been out of practice for a long time, or have never been trained to perform a certain skill. Therefore the government introduced that construction training must take place during the project.

Usually the amount available for training will be giving to the quantity surveyor, prior to the tendering stage and thus he can include it in the tender document. Usually the Quantity Surveyor will make provision for a budgetary allowance in the preliminary section of the Bills of Quantities.

Figure 3

	Occupational Health and Safety on site in respect of Act no. 85 of 1993			
107	Provision of Occupational Health and Safety Plan			
	F:..... V:..... T:.....			
108	Implementation of Occupational Health and Safety Plan			
	F:..... V:..... T:.....			
109	Training			
	F:..... V:..... T:.....			
110	Provision of Occupational Health and Safety file to client upon completion			
	F:..... V:..... T:.....			
111	Safety officer			
	F:..... V:..... T:.....			
112	Allow the sum of R2,500 per month to be paid for the CLO as and when instructed by the Engineer over a provisional period of 9 months		22 500	00
113	Allow for profit and attendance			
114	Allow a sum to be paid for accredited training to be provided on written instruction by the Engineer (3 quotes to be provided by the contractor for approval)		30 000	00
115	Allow for profit and attendance			
		Carried Forward	R	
	Section No. 1 SECTION 1 Bill No. 1 PRELIMINARIES			

-131-

(Labour intensive Bills of Quantities, VDW Quantity Surveyors; 2010)

According to a document by the Department of Water Affairs and Forestry (2001) some training and skills transfer takes place and it can be assumed that a number of the people employed as labourers may use this opportunity as a stepping stone to embark on a career in construction. Unfortunately it is likely that they will leave the area and follow the Contractor to wherever new projects are executed. The skills do not remain in the community and are thus not available for ongoing maintenance of the infrastructure.

3.4 Labour intensive costs compared to Traditional Contraction projects

The cost of community-based projects, inclusive of that associated with the developmental support provided has been found, with the exception of road construction, to be comparable with that of conventional plant based construction on various projects where the Development Team Approach has been adopted, (Watermeyer and Band, 1994; Watermeyer et al, 1994), namely:

• Upgrading of secondary water mains (Soweto) : 15 - 30% less expensive;

• Internal sewer and water reticulation for a housing development (Sandton) : 6% less expensive;

• Installation of low voltage cables (Ibhayi) : 16 to 19% less expensive.

In all the above mentioned projects, tenders have been awarded to community-based contractors where their tender prices are not normally more than 10% below the Construction Manager's estimated value. In all cases, the estimate used for tender adjudication purposes is based upon the prevailing minimum wages laid down in the Wage Order for Civil Engineering Works for casual employees. Community-based contractors therefore have the potential to remunerate their workers in accordance with the prevailing minimum hourly rates on these projects. This has been achieved by changing the cost structure of contracts by the approach adopted.

Watermeyer (2010) explains the typical cost structure of traditional (conventional) contracts and community-based contracts for the provision of infrastructure that may be compared as follows:

Traditional

- Preliminary and General Items

- Labour @ cost + overheads + profit

- Materials @ material price + waste allowance + overheads + profit

- Plant @ cost + overheads + profit

Contract price = sum of above.

Community-based - Disbursements (Provision and maintenance of site facilities, transport for site staff, printing, computer costs, etc.)

- Management fees and site staff charges

- Materials @ cost + waste allowance - settlement discount

- Plant @ cost

- Labour @ cost + nominal overheads + profit

Contract price = sum of above.

Norms expressed as a percentage of cost of the Works :

Traditional :

P's & G's	15%
Profit on materials and plant	6%
	21%

Community-based :

Disbursements	3,0%
Site/stores staff charges	12,0%
Management fees - materials	3,0%
- construction	4,0%
	22%

From the above analysis, it can be seen that community-based construction should be cost comparable with traditional construction and possibly cheaper, as community-based contractors have lower overheads while materials and plant are supplied at cost to the project. In effect, profit on materials and a conventional contractor's overheads are traded for development support costs.

3.5 Employment Opportunities

"Traditionally, the construction Industry has been viewed as an industry which produces a high rate of employment per unit of expenditure. In South Africa, its ability to generate employment per unit of expenditure is only surpassed by that of the clothing and the textile industry. It is, therefore, not surprising that job creation initiatives are linked to this industry." (Soderlund and Schutte,1994)

"The average cost in South Africa to generate a manhour of employment in the civil engineering industry currently amounts to R37. The building industry, on the other hand, is fewer machines orientated and, to a large extent, is labour-based by nature. In house construction, depending upon the standard of housing required, the cost per manhour of employment generated lies between R19 and R28." (Watermeyer and Band, 1994)

"The current cost per manhour of employment on projects involving the construction of water pipelines and surfaced roads in Soweto, where community-based construction practices are employed, ranges from R17 to R19." (Watermeyer, et al, 1994)

Approximately 15% of the manhours involved on infrastructure projects relate to construction and materials management activities. On projects where community-based construction practices are employed, targeted community may be engaged in a significant proportion of these manhours.

3.6 Cost Retained by the Community

"The amount of construction cost retained by the community gives an indication of the degree to which entrepreneurship and small scale enterprises are promoted in the community and

are a direct measure of the benefit accrued by the community from the project as well as that of economic empowerment." (Watermeyer et al, 1994)

"In community-based construction projects in Soweto, where materials are not manufactured by the community, the amount retained by the community varies from 37 to 50%, depending upon the cost inputs relating to materials. This is achieved through the community's involvement in the construction contracts (25- 33%), transport of materials (2 - 9%), construction management (6-7%) and materials management (2-3%)." (Watermeyer, et al, 1994)

"In house construction, the cost retained by the community by means of community-based construction practices can be in excess of 40%. Where communities engage in the manufacture of materials, these percentages will increase." (Watermeyer and Band, 1994)

3.7 Summary

The financial aspects of a labour intensive project are of major importance. At the end of the day the end result for a successful project relies on the funding to the project. Also, the more funds injected into a contract, the more valuable the project becomes. However, if the money is not used in an efficient way and there is a lack of planning, large portions of funds will be lost.

A labour intensive project consists of much more administration then a traditional contract. The government provides much more "rules" to comply with and thus making it more technical for both the contractor and the employer.

3.8 Hypothesis

In above text it is clearly visible that a labour intensive project must receive a lot of attention. If not well managed the project will lack in performance and cause a delay in construction time. This correlates with the initial hypothesis.

It is also clear that a labour intensive project can benefit to the community in many different ways. It also creates a sense of hope to the community and in many projects made a difference in many of the local's lives.

3.9 Conclusion

The initial thought was that a labour intensive project is more expensive than a traditional construction project, but according to above text, the project is actually more inexpensive. Not only on the construction costs but also creates an asset for the local community. Certain projects however were not well managed at all. The conclusion can be stated that a labour intensive project, if well managed, will be successful and sustainable to the community and the whole country. "As long as quality and cost-effectiveness are not compromised, labour intensive approaches to infrastructure development can also be an important instrument for economic growth" (World Bank, 1994)

CHAPTER 4: The Characteristic Of Quality In a Labour Intensive Project

4.1 Introduction

In the previous two chapters the aspects of time and cost in regards with a labour intensive project were discussed. The third factor that will be discussed is quality of labour. In labour intensive projects, the contract focuses on making provision for labour work and thus the minimal amount of plant will be allowed for. This chapter will focus on the quality of the proposed labour methods and sustainable development.

4.2 Sustainable Development

“Sustainable Development is a self-initiated and self-sustained development process based on the needs and resources of the community while minimising the reliance on external resources, and the goal is the restoration of individual identity and dignity and the promotion of people's participation in every walk of the developmental process. Therefore, in its truest sense, Sustainable Development is a developmental process initiated by the people themselves. What is most needed is to facilitate and encourage people to organise for such efforts which eventually will help in attaining a better livelihood. It is therefore of utmost importance to help the communities in enabling them to initiate such a process of development rather than to provide ready-made packages.” (Watermeyer, 1995)

According to Pant (1991), a 'sustainable community development approach' should be based on the following convictions:

• The process of 'development' should be self-sustaining in the long run;

• The very process of 'development' must be initiated by the 'people' themselves;

• The roles of 'outsiders' must be time-bound and their scope of assistance limited to the provision of alternatives and, if necessary, towards the provision of 'seed capital', including human capital;

•The dependence on 'outside' resources must be as far as possible minimised

“For sustainable development work, it is not important how we define a community, but how the people we try to serve regard themselves as being a community. People themselves know

best on whom they are dependent, to which they can communicate with whom they meet for individual needs and social or common needs. This also applies to participation." (Ymker, 1991)

The role of development groups should be to empower people to make better use of these and to assist them to improve their quality of life. Development should be seen in the context of a process rather than an end in itself. "Community participation is based on the premise that in a community there is knowledge, skills, attitudes and resources on which people can build."(Ymker, 1991)

Community participation is very important in a labour intensive project and can range from taking part in meetings to decide upon which services are required or where a service needs to be constructed, and to becoming involved in the construction of such a service.

"At one end of the spectrum this could include the undertaking of a needs assessment to ascertain what is actually required and what the associated priorities are, while at the other end of the spectrum the community could, if provided with the necessary developmental support, be mobilised to construct their own infrastructure." (Watermeyer, 1993)

Community bases construction projects can be effectively used in many different components of the Extended Public Works Programme such as public works, housing programmes or Municipal upgrades to certain communities. The main aim of the implementation of community based construction is to maximise the benefits to a community through the creation of jobs and assets. This method of construction ensures that skills and competencies are developed while assets are being constructed. Community based construction also ensures that the profits made and the skills obtained from the projects remain within the community to enable that community to build up their resources.

According to Watermeyer, the projects involving the creation of assets in the different programmes should be structured to promote sustainable development. In practice this means that projects should be structured so as to:

• create employment opportunities;

• promote community involvement;

• impart technical skills to the unskilled and semi-skilled members of the community;

• transfer administrative, commercial and managerial skills to the community;

• retain, as far as possible, the funds expended on the project within the community; and

• develop contractors and entrepreneurs from amongst the community.

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4.3 Community-based Construction

According to Watermeyer and Band (1993), Community-based construction may be defined as the use of labour-based technologies and labour-intensive methods on projects in which the community is, in addition, involved in the commercial, managerial and administrative aspects so as to maximise the amount of funds retained within the community and to transfer skills and competencies to the community.

Community-based construction in a sensitive and non-imposing manner aimed at the use of labour-based projects to promote the emergence of local entrepreneurs who, with adequate technical, commercial and financial support and instruction, can, in due course become fully fledged contractors/subcontractors, should they so desire. Community-based construction practices make use of technologies which optimise the use of labour and methods of construction which maximise the use of labour in a cost effective manner, and implement these employment intensive options in construction by means of small scale contractors.

In community-based projects, members of the community can also become involved in the:

• Operation of stores facilities;

• Support provided to local contractors for example administration, monitoring of progress;

• Transport of materials to local labour-only contractors;

• Manufacture of certain materials

• Supply of minor materials; and

• Security of the site;

When considering above, one must be meaningfully exposed to management and administrative activities and further benefit from the employment and entrepreneurial opportunities presented thereby.

4.3.1 Conventional approach to construction of services

"Traditionally, township services are constructed by established plant-based contractors who have all the necessary resources, namely:

• Finance for salaries and wages;

• Credibility in commercial circles to obtain sureties, to open accounts with suppliers and to hire plant; and

• Managerial, commercial, technical and administrative skills required to secure and execute contracts." (Watermeyer,1993)

4.3.2 Barriers to entry

The barriers which prevent local entrepreneurs or small building contractors in a local community from engaging in civil engineering construction are the:

• Tendering and contractual requirements, such as the provision of sureties, the inclusion of penalty

clauses and the tendering of rates;

• Prevalence of plant-based construction practices;

• Lack of financial resources to purchase materials, hire plant and tools and to pay wages;

• Lack of credibility in commercial circles;

• Lack of commercial, managerial and administrative skills;

• Discontinuity of work; and

• Lack of technical competence.

The abovementioned barriers to entry can be reduced by the:

• Employment of labour-based technologies;

• Provision of access to resources that are lacking, e.g., bridging finance, materials, plant, etc.;

• Provision of developmental assistance; and

• Structuring of contracts.

Thus if communities are to be engaged as contractors in construction, changes both in the construction method and the construction process are required (Davis, 1993)

4.3.3 Development support required for emerging contractors

“The conventional approach to construction by calling for tenders and engaging a contractor of SACEC does not produce civil engineering contractors as evidenced by the absence of black members.

Neither will the insistence that local contractors be engaged as subcontractors on a project necessarily elicit a response from the community as this approach presupposes the existence of such contractor who have both the necessary resources and who are capable of executing the relevant work; nor will the inclusion of clauses in contract documentation which aim to restrict the use of plant or make the use of local resources obligatory, necessarily involve communities in the managerial, commercial and administrative aspects of construction.

Local entrepreneurs from underdeveloped communities cannot engage in construction without developmental support and the acquisition of external resources. “(Davis; 1992)

Various methods to implement labour-based technologies and labour-intensive methods and to facilitate the involvement of entrepreneurs from targeted communities are presented in the report commissioned by the National Housing Forum entitled “The development of small scale enterprises, skills, and entrepreneurship and employment opportunities through the provision of housing". In this report, two approaches are recommended for engaging local contractors in construction projects namely the Managing Contractor and Development Team approaches.

The Development Team approach ensures that the ownership of the project remains with the community and readily allows the community to participate in construction and materials management and other construction related activities.

The Managing Contractor approach, on the other hand, is somewhat restricted in scope and permits the community only to own subcontracts. The contractor support mechanism between the two approaches is, however, similar. To illustrate the support mechanisms and to demonstrate how communities can be meaningfully engaged in as wide a scope of construction activities as possible, the Development Team approach will be used to illustrate the necessary developmental support required." (Nevin, 1994)

4.3.4 The Development Team Approach

"In the Development Team Approach, experienced and suitably qualified persons assist local community based contractors with the administration and management of their contracts, offer technical training, engage specialist contractors, and supply the necessary materials and equipment. In addition, the development team employs and trains members of the local community to run stores facilities, monitor progress, assist with administration, etc. Normally, the local contractor enters into a contract with the client/funding body and the development team is appointed on a fee basis directly by the client. The development team may be regarded as construction facilitators who arrange to provide resources that the contractor lacks. In a community-based project, the Development Team must ensure that certain specific functions are carried out, normally by the following individuals who assume distinct responsibilities:

• The Design Engineer.

• The Engineer.

• The Construction Manager.

• The Materials Manager.

Experienced contractors, project managers or consulting engineers may perform the duties and assume the responsibilities of the Construction and Materials Managers. However, the design and supervision of the works, that is the duties and responsibilities of the Design Engineer and the Engineer must be undertaken by Professional Engineers or Technologists.

It should be noted that the Construction and Material Managers are appointed by the client on a fee basis in terms of a scale of fees. Thus the contractor is motivated by profit to

successfully complete his contract whereas the Development Team is motivated by seeking to secure another appointment.

Model forms of agreement have been written for the appointment of Construction and Materials Managers" (Soderlund and Schutte, 1994).

4.3.5 Support provided by Construction and Materials Managers

The developmental support provided by the Construction and Materials Managers may be summarised as follows:

Construction Manager

- Offer advice, practical assistance and training;

- Provides plant other than small tools;

- Arranges for specialist work;

- Arranges for payment of fortnightly/weekly wages; and

- Transport of materials to site.

Materials Manager

- Provides all material

In terms of the model form of agreement, the Construction Manager is required to advise, assist and train on the- job the contractor in the execution of his contracts and to this end shall make visits to the Site at such intervals as he deems appropriate during the various stages of construction in order to ensure that the Contractor makes satisfactory progress, shows technical competence in the execution of all aspects of the works and generally fulfils his contractual obligations.

"The Construction Manager shall procure the services of site staff, as necessary, to assist him and provide continuous support to the Contractor in order to ensure that the Client's objectives are achieved.

The Construction Manager cannot, however, ensure the performance of the Contractor, nor guarantee against any failure by the contractor to perform his work in accordance with the Contract." (Soderlund and Schutte Inc, 1994)

“The Construction Manager's function is therefore to minimise the client's contractual risk and to meet the client's objectives of having the works constructed to specification within a specified period and a given budget using community-based contractors and labour-based construction practices. Thus the client has the assurance that the local small contractor, by relying on the support provided by the Construction Manager, will have the necessary skills available to adequately complete the contract.” (Watermeyer and Band, 1994)

“The support provided is flexible and can be varied depending upon the needs of the community, e.g., if the community is capable of procuring the materials, then there would be no need for a Material's Manager.” (Hallett 1994)

4.3.6 Risk to the Client

The risk to client is probably less than that of conventional contracts in spite of the fact that no sureties are called for (Watermeyer and Davis, 1993). This is due to:

- Smaller contracts of short duration;
- Labour-only contracts;
- Contractors are paid only for work done;
- 10% retention being applied to all contracts;
- The structure of the developmental support provided; and
- Developmental team members carry professional indemnity.

4.4 Public works Infrastructure and Maintenance in South Africa

"The government of National Unity initiated the National Public Works Programme after 1994 elections. In essence the NPWP consists of a process of labour-intensification and increased training and capacity building in the provision of infrastructure. The NPWP is a key component of the Government's Reconstruction and Development Programme. The NPWP has been shifted towards a Community Based Public Works Programme, which places more emphasis upon smaller companies and regulatory bodies than a national programme. The main item in the Agreement is first, where industry commits itself, maximise the use of labour-intensive systems of construction within public works programme, with due regards to economics." (McCutcheon, 1999)

According to Abedian and Standish (1986) the Trade Union Research Project reported that the most prevalent causes of failure of public works programmes were;

- Seldom scaled to the magnitude of national manpower needs;
- Implementation using inappropriate technology;
- Often introduced in a fragmented and unsystematic way;
- Introduced on an ad hoc basis and were not linked to an overall development policy;
- Lacking administrative back-up;
- Lacking adequate post project maintenance; and
- Almost entirely dependent upon the government's commitment to the programme: if there was a lack of commitment this would be reflected in a lack of funding.

By contrast, experience in South Africa has not been impressive. "To date in South Africa projects and programmes with similar objectives have not been as effective. Over the past 15 years, billions of Rands have been spent on projects and so-called programmes with stated objectives of both creating employment and providing physical infrastructure such as roads, water supply and sanitation." (Thwala, 2001)

Thwala (2001) furthermore explains that these objectives, community participation and entrepreneurial development have been added. Based on both the international and local experiences, the problems of South African large-scale public works programmes prior to 1990

can be attributed to the following factors, which must be avoided in order for large-scale projects to be successful in South Africa:

- There has been a lack of clear objectives linking the short and long-term visions of the programme.
- There were no pilot projects with extensive training programmes of lead-in time to allow for proper planning at a national scale. This should have allowed sufficient time to develop the necessary technology, establish training programmes and develop both the institutional and the individual capacities.
- The programmes have been introduced in an unsystematic and fragmentary style. This often led to technical hastiness, which was compounded by incompetence and inappropriate technology selection.
- There have been organisational infirmities and inappropriate administrative arrangements.
- There has been a lack of political and government commitment to the projects and programmes.
- There has been an imbalance between centralisation for higher level co-ordination and decentralisation for local decision –making and execution of works.
- There has been a lack of clearly defined and executed training programmes that link medium to a long-term development plan.
- There was no long term development planning.
- Most of these projects and programmes were highly politicised.
- The budget allocations were arbitrary.

“In the early phases the emphasis was upon the creation of employment opportunities for unskilled labour. Over the past decade it has become clear that in order to use labour productively it is necessary to train a skilled supervisor who is technically and organisationally competent and thus able to direct and motivate the workers under his or her control. “(McCutcheon, 1999)

4.5 Summary

It is very important to not only analyse the theory of the current situation of labour in South Africa, but also to concentrate on the physical practise and outcomes of current projects. One large factor of a quality project is supervision. "For a successful national programme it is necessary to educate engineers about employment creation and train them in the specific skills required in planning, control and evaluation of large labour-intensive programmes. In time, and experienced technician or technologist should be able to do this level of work releasing the engineer for engineering and planning." (McCutcheon, 1994)

4.6 Hypothesis

The quality of labour intensive contraction is at the moment not sufficient. However, there is a comprehensive plan and management system in place for the future implementation of these projects. At the moment the situation in South Africa is not up to standards and there is much room for improvement.

4.7 Conclusion

The hypothesis is correct. Again, through management and sufficient supervision these projects can be successfully implemented. South Africa does have the potential and if the disadvantages and problems can be minimized there is a bright future for labour intensive projects in the future.

Much can be learned from other counties that is also making use of labour intensive projects. Both Botswana and Kenya have a positive success rate and are looking very optimistic for the future. McCutcheon considers the following points as the main reason for the success of the programme in the above mentioned countries:

- Good preliminary analytical work and thorough attention to technical aspects throughout the work;

- Pilot projects which tested all aspects and acted as the embryonic training programme for future work;
- Strong institutions with good management systems: yet flexible;
- Extensive training;
- Long-term political support;
- Long-term financial support.

CHAPTER 5: What Are The Positive Outcomes Of Labour Intensive Projects?

5.1 Introduction

South Africa is a third world country, and certain characteristics that surround third world countries are factors like poverty, unemployment and the lack of educated people. Poverty has led to the growth of Informal Settlements which are basically, but not necessarily so, residential areas for the low-income groups.

The most noted cause of Informal Settlements is high migration from rural areas by people who are in search of job opportunities and better living conditions than what is available in the rural areas, and this can be clearly seen in areas like Gauteng. This has led to more demand for low cost housing in most urban areas in South Africa.

"History has shown that labour-based methods of work have long been used in creating remarkable infrastructure works. Labour-intensive programmes generate more direct and indirect local employment opportunities and income by using locally available inputs (materials, simple tools and local labour) and thus creating a greater demand for local products and services than do high-technology programmes reliant on imported technology and equipment. Investment in low cost housing has a huge potential to redress the high unemployment and poverty levels in South Africa and also to correct the skill deficits in disadvantaged communities." (Thwala, 2001)

Thwala (2001) further explains that from a theoretical perspective supported by experience elsewhere in Africa, there are reasons for considering that properly formulated labour-intensive programmes could be established to construct and maintain the required physical infrastructure, thus creating employment, skills and institutional capacities.

"In South Africa, the levels of unemployment and poverty are extremely high and two of South Africa's most pressing problems" (McCutcheon, 2001). "The levels of unemployment have been rising steadily over the years. The level of unemployment was 7% in 1980, 18% in 1991 and 28% in 2003" (Statistics South Africa, 2003).

"Commitment to alleviation of poverty has become very high on the government agenda and will stay one of the focal points of government. This is motivated by the fact that, currently around 24% of the population lives on less than $1 a day, and thus far below the poverty line." (World Bank, 1994)

In addition to high levels of unemployment, there is also a widely acknowledged need for housing and municipal infrastructure (water supply, sewerage, streets, stormwater drainage, electricity, refuse collection). But most importantly, it is crucial to realise that there is a great need for physical infrastructure in both urban and rural areas. In addition there is a lack of capacity and skills at institutional, community and individual levels. This problem of infrastructure backlog is aggravated by the apparent lack of capacity and skills at institutional, community and individual levels.

According to the World Bank (1994: 2) infrastructure can deliver major benefits in economic growth, poverty alleviation, and environmental sustainability - but only when it provides services that respond to effective demand and does so efficiently.

Over the past 25 years several projects have been initiated in South Africa to counter unemployment and poverty (Thwala, 2001). It is envisaged that there will be others in the future. From a theoretical perspective supported by experience elsewhere in Africa, there are reasons for considering that properly formulated employment creation programmes based on the use of employment-intensive methods could be established to construct and maintain the required physical infrastructure, thus creating employment, skills and institutional capacities. The provision of low-cost housing has the potential to redress this problem of very high unemployment levels in South Africa and also to correct the skill deficits in disadvantaged communities. Among other things, these may be achieved through an efficient institutional set up, effective community participation, and construction technology that is pragmatic and innovative in nature.

5.2. Infrastructure and Employment Creation

“Public works programmes have a long history in the developing countries as an economic-policy tool, both as a fiscal measure to expand or contract public spending in periods of unbalanced domestic demand as well as a short-term measure to alleviate unemployment.” (Thwala, 2001)

In recent years, public works programmes have formed important components of special job-creation schemes launched by many industrialised countries in response to either economic recession or rising unemployment among youth.

In contrast to their short-term, anti-cyclical role in the industrialised countries, labour-intensive public works programmes have acquired far more significance in developing countries where they are now frequently resorted for one or more purposes, such as the following outlined by Jara (1971) as long ago as 1971:

1. To deal with emergency situations arising out of natural calamities such as drought, floods and earthquakes, when provision of immediate relief employment to the affected area and repair and reconstruction of damaged assets and infrastructures become urgently necessary;

2. To serve as a means for harnessing the potential resource of surplus manpower and for evening out seasonal fluctuations in employment and incomes, especially in areas exposed to pronounced seasonal unemployment and underemployment;

3. To achieve permanent drought-proofing of drought-prone areas through systematic soil-conservation and water-development measures, utilising large masses of unskilled workers;

4. To attend to long overdue tasks of erosion control and other land-development works without which agriculture would begin to stagnate and agricultural inputs fail to produce the expected results; and

5. To promote systematic development of essential infrastructure facilities integral to rural and urban spatial planning, that is, the promotion of rural development centres, community development blocks, small and medium market towns, regional growth centres and focal points, and new urban townships.

These major programmes generally comprise a wide variety of minor and intrinsically labour-intensive works such as soil conservation and reforestation; small and medium-scale irrigation (for example, canals, field channels and dams); drainage; flood-protection and land-development schemes; rural access and crop-extraction roads; and basic amenities such as inexpensive housing, drinking-water-supply projects, school buildings, and health and community centres. They are often undertaken with the involvement of local communities and institutions in their identification, formulation and supervision. They utilise predominantly public funds but sometimes receive supplementary support in the form of local community

contributions in cash and materials, as well as food aid provided by bilateral donors or multilateral aid agencies such as the World Food Programme.

“By sustaining demand for large masses of purely unskilled labour, these rural works programmes indeed provide an important contribution towards a simultaneous solution to the problems of rural employment, income distribution and growth. Their direct and indirect employment and income effects apart, the infrastructure they create supports agriculture and helps to preserve the ecological balance of land and forest areas which have long suffered excessive exploitation; accelerate the integration of monetized and non-monetized sectors; helps to modify the prevailing spatial distribution pattern of rural settlements so as to facilitate the more economical provision of common facilities and growth of viable rural communities; and, finally, they meet some of the more elementary basic needs of the poorer sections.” (Thwala, 2001)

5.3 Labour-Intensive Approach

In order to alleviate poverty and generate employment during the construction and maintenance of infrastructure projects, attempts must be made to encourage the use of labour-intensive methods.

According to Bentall (1999) the labour-intensive approach is defined as an approach where labour is the dominant resource for carrying out works, and where the share of the total project cost spent on labour is high (typically 25 – 60%). The term labour-intensive approach indicates that optimal use is made of labour as the predominant resource in infrastructure projects, while ensuring cost-effectiveness and safeguarding quality. This involves a judicious combination of labour and appropriate equipment, which is generally light equipment. It also means ensuring that labour-intensive projects do not degenerate into “make-work” projects, in which cost and quality aspects are ignored.

Labour-intensive construction results in the generation of a significant increase in employment opportunities per unit of expenditure by comparison with conventional capital-intensive methods. “By ‘significant’ is meant 300% to 600% increases in employment

generated per unit of expenditure." (McCutecheon, 2003) The employment-intensive approach is otherwise called the "labour-based approach", indicating that labour is the principal resource, but that appropriate levels of other resources are used in order to ensure competitive and quality results.

5.4 Overview of African Experiences through the use of Labour-intensive approach in Infrastructure Programmes

The use of employment-intensive public works programmes is not new to Africa. In the 1960s, three countries in North Africa, namely Morocco, Tunisia and Algeria, experimented with such programmes. Although started initially as emergency relief works programmes, especially in rural areas, it gradually came to acquire a development orientation. "The Moroccan experiment, known as National Promotion, was launched in June 1961. This large-scale programme aimed at enhancing opportunities for the rural unemployed in productive works; and slowing down the rural exodus and associated problems with rural populations in the development process. The importance of this programme was confirmed by its mention in the constitution of 7 December, and subsequently by the creation in 1975 of the High Council of National Promotion Plan. According to one estimate, the programme provided employment for 85 000 workers per month during the peak season and increased GNP by 3, 6 per cent". (Jara, 1971)

"During the period 1959-1960, a large Tunisian works programme, known as Worksites to Combat Underdevelopment was carried out with 80 per cent of the cost being borne by Tunisian authorities and the remaining 20 per cent in the form of food aid from the United States. The employment created was equivalent to an annual average of 20.7 days per head of Tunisia's labour force" (Thwala, 2001). According to Jara (1971) In Algeria, the publicly-sponsored works programme, known as Worksites for Full Employment (Chantiers de plein emploi (CPE)) began operating in 1962 as a relief operation. It soon acquired a strong development orientation to maximise employment in a project of economic interest, namely reforestation work to fight the severe erosion problem. In 1965, the Peoples Worksites Reforestation (Chantiers populaires de reboisement (CPR)) was created as a statutory body attached to the Forestry Division of the Ministry of Agriculture and Agrarian Reform. Since

then, the World Food Programme has provided assistance and the scope of projects have been increased to include land reclamation and other infrastructural works.

A variety of employment-intensive works programmes in other countries consisted of limited experiments with local self-help projects. In such cases, the projects were proposed by local communities and the state made its technical assistance conditional on their execution by the local population. The intention was to get the work done as cheaply as possible, but more especially to ensure that the people viewed the projects as their own and so paid more attention to their maintenance.

Such self-help schemes occupy a prominent place in the rural development effort in Tanzania. These schemes started after independence, when there was a massive campaign to mobilise the people for nation-building with financial assistance from local and foreign institutions, and then from the Regional Development Fund. “Under the village-development policy pursued by the government, the emphasis has been put on building, water works, and road construction. Ujamaa and co-operative development officers at village and district levels have helped in identifying and selecting projects, while rural housing and construction units stationed at district headquarters provide technical advice and support.” (Jara, 1971) In the 1980s and 1990s scholarly assessment of the Tanzanian experiments also revealed serious shortcomings.

“A few countries have tried to create, through employment-intensive infrastructural works, relatively small ‘functional economic areas’ in the countryside in an attempt to stem rural-urban migration and retain more people on the land. An example is the Djoliba pilot project in Mali for converting a swollen rural village into an agro-urban community, which calls for several layers of investment in infrastructure. This project was to test the feasibility of the establishment of some 150 rural centres that would service Mali’s more than 10 000 villages.” (Thwala, 2001) The Volta River Settlement Programme of Ghana, involving the creation of network of rural towns and access roads, is another example of rural spatial planning. Three times as many workers were employed in these resettlement preparations than were involved in building the Volta dam, showing the employment-generating potential of employment-intensive infrastructural investment.

“In Kenya, over 12 000 kilometres of rural access roads have been constructed and over 80 000 man-years of employment have been created”. (McCutcheon, 1993) The Kenyan Rural Access Roads Programme is the overall responsibility of the Ministry of Transport and Communications but operates within the national District Focus policy which gives great

autonomy to the local level. According to McCutcheon (1994) the methods have been considered so successful that they have been introduced in the secondary roads network (the Minor Roads Programme). “In Botswana a national programme of labour-intensive road construction units has been set up within District Councils which are semi-autonomous bodies under the overall responsibility of the Ministry of Local Governments and Lands. This programme has resulted in the creation of over 3 000 jobs (total employment within the public sector is only 20 000) and the construction and upgrading of nearly 2 000 km of road.” (McCutcheon, 1995) “In Malawi the programme is part of the Ministry of Works and Supply. Since its inception, over 3 845 km of district road have been upgraded in 16 of the country’s 24 districts. The Labour Construction Unit in Lesotho has been attached to the Ministry of Works since 1977. By 1985 about US $3 350 000 had been expended on various road construction works.” (Thwala, 2001)

Thus, within different institutional and organisational frameworks, a wide range of techniques of labour-intensive road construction and maintenance has been extensively tried and tested over the past 25 years. Despite their valuable contribution to employment-generation, many of these earlier experiments in employment-intensive public works in Africa suffered from one or more of the following short-comings according to McCutcheon and Parkins (2003):

• The ad hoc nature of schemes, lacking spatial focus and often without any links to national rural development and infrastructural planning systems.

• Makeshift administrative arrangements and failure to inject sufficient managerial and engineering skills and technical competence into project selection and execution, as well as choice of technology, resulting in poor project planning, programming and manpower management.

• Lack of balance between centralisation and effective involvement of local administrations and popular bodies in crucial programme decisions, planning and implementation.

• Failure to adjust programme operation and intensity to seasonal labour demand for agricultural operations.

• Lack of precision about target groups and programming on the basis of inadequate information about beneficiary groups.

• Lack of adequate and sustained political commitment and allocation of public funds for the programmes.

• Inadequate post-project maintenance arrangements.

• Inadequate emphasis on, and arrangements for, reporting cost-benefit studies and general performance evaluation.

5.5 Housing Problem in South Africa

"The apartheid legacy and the repercussions of the policies implemented by the Nationalist government are still with us. The housing crisis is not a localised phenomenon; it is a global crisis which all countries are finding them in the midst of it manifests itself in different ways in the different societies, but it is usually the poor who are hardest hit by this problem. The main problem is the governments' lack of capacity and sometimes lack of interest to deal with the problem in an effective and efficient manner. Institutional frameworks which are in place are not adequate to deal with the problem. In most Third World countries these have been inherited from the colonial era, and they are inappropriate for the circumstances which prevail today. This poses a problem, as change is a slow and difficult process, which some people do not want to embark on as a result of the fear of change." (Dlungwana, 2002)

South Africa is no different to the rest of the world and it too is suffering the same fate. The housing backlog inherited from the apartheid government, combined with the rise in unemployment and poverty. There is now a larger number of urban poor who have to be housed on the limited government budget. Due to the current housing conditions there has been a rise in the squatter settlement movement. Squatter or informal settlements occur either as a direct result of government policy, or as a result of land invasions. These squatter settlements are one of the ways in which the urban housing crisis has manifested itself. It is a result of the need for people to try and solve their own housing needs in light of the fact that the government does not have the capacity to do so.

5.6 Current Employment through Extended Public Works Programme

The Extended Public Works Programme has many different strategies and programme. One of the programmes has made a remarkable difference in many people's life is the Provincial Roads Programme.

According the EPWP five year report (2009) the Provincial Roads Programme ensures adequate reporting on work opportunities created during construction and/or maintenance of access roads projects.

This programme imparts best practice principles in designs and implementation of provincial access roads projects to ensure that labour-intensive methods of construction or maintenance are promoted. More than 88 000 work opportunities were created on provincial access roads projects for the 2008/09 financial year alone.

Since there are more than 64 programmes in the Provincial Roads Programme, the following table provides a consolidated version in the form of provincial outputs, rather than programme outputs.

The following table shows the success rates of different provinces in South Africa.

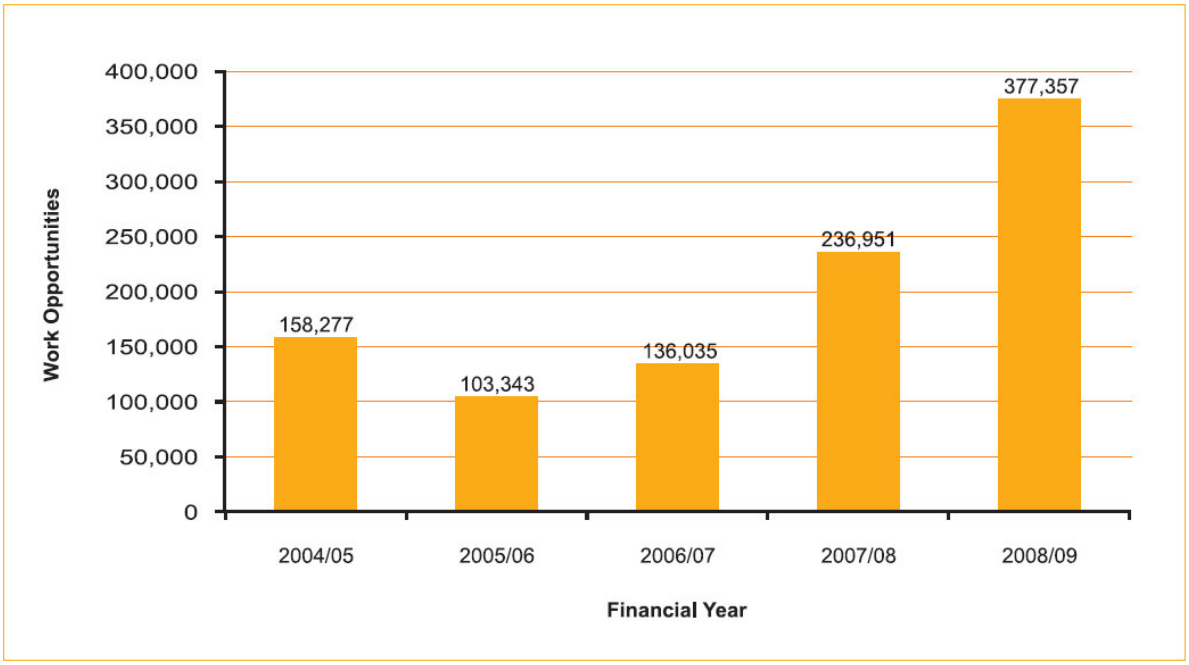
Table 4

Province	Budget	Expenditure	Jobs Created
Eastern Cape	R 977,276,551	R 783,255,880	24,794
Free State	R 384,513,000	R 252,756,715	1,828
Gauteng	R 347,127,120	R 238,993,831	3,428
KwaZulu-Natal	R 523,683,436	R 431,409,599	44,185
Limpopo	R 108,700,994	R 80,601,769	2,837
Mpumalanga	R 68,299,000	R 52,439,648	2,964
Northern Cape	R 346,532,816	R 301,413,220	2,215
North West	R 164,990,593	R 101,083,870	858
Western Cape	R 787,504,946	R 731,000,568	5,370
Total	**R 3,708,628,456**	**R 2,952,955,100**	**88,479**

(Roads Programme: Performance by Province, EPWP five year report (2009)

It is further noted that the EPWP's Infrastructure Sector has created more than one million jobs over the five-year period. The following graph illustrates the number of work opportunities created in the Infrastructure Sector per financial year.

Figure 4



(Number of work opportunities created in Infrastructure Sector per financial year, EPWP five year report (2009)

5.7 Employment Potential in the Process of Housing Provision

In countries where labour is abundant, increased construction activity would be one sure way to increase employment. The construction industry is particularly important for absorbing unskilled labour; giving work to the lowest income sector in the economy. As long ago as 1974, Germidis have suggested that construction has the potential to be very labour-intensive sector, particularly so when housing is concerned. According to Ziss and Schiller (1982), an analysis of a low-cost housing project in Ghana suggests that 30 per cent of the construction cost can be attributed to labour utilised directly in the construction process and an additional

eleven percent to labour utilised indirectly in the production and distribution of construction materials.

By contrast, experience in the provision of low-cost housing in South Africa has been not impressive. To date in South Africa projects with similar objectives have not been as effective.

“Over the past 25 years, billions of Rands have been spent on projects and so-called programmes with stated objectives of both creating employment and providing physical infrastructure such as roads, water supply and sanitation” (Thwala, 2001)

Based on both the international and local experiences, the problems of the employment creation through the provision of low-cost housing in South Africa through labour-intensive methods had been attributed to the following factors, which must be avoided in order for future projects to be successful in South Africa:

• There has been a lack of clear objectives linking the short and long-term visions of the programme.

• There were no pilot projects with extensive training programmes or lead-in time to allow for proper planning at a national scale. This should have allowed sufficient time to develop the necessary technology, establish training programmes and develop both the institutional and the individual capacities.

• The projects have seldom been scaled to the magnitude of national manpower needs and very often they have been introduced in an unsystematic and fragmentary style. This often led to technical hastiness, which was compounded by incompetence and inappropriate technology selection.

• There have been organisational infirmities and inappropriate administrative arrangements.

• The projects have been over ambitious. This was a result of the lack of appreciation of the time it takes to build the necessary individual and institutional capacities at various levels.

• There has been a lack of clearly defined and executed training programmes that link medium to a long-term development plan.

• Very little sustainable employment was created.

• Individual skills were not improved. Training, where present, was not particularly appropriate or focussed and has not shown it to be carried through into post- project employment.

5.8 Training

A major factor in the success of a labour intensive project is training. The Extended Public Works Programme tries to improve unemployment but also to train people certain skill to contribute in their development. Training also benefits the project itself, especially when comparing a trained contractor with an inexperienced contractor; the difference can be clearly seen in the progress of the project.

The Extended Public Works Programme makes provision for training but also insists in expert guidance during the project. The public body must ensure that:

• The design of the labour-intensive works by consultants is overseen by persons in their employ who have completed the necessary skills training;

• Works contracts are administered by persons in the employ of consultants who have completed the necessary skills training; and

• Works contracts are awarded to contractors who have in their employ managers who have completed the necessary skills training.

5.9 Summary

In early phases the emphasis was upon the creation of employment opportunities for unskilled labour. Over the past decade it has become clear that in order to use labour productively it is necessary to train a skilled supervisor who is technically and organisationally competent and thus able to direct and motivate the workers under his or her control. Low-cost housing projects in South Africa should change as the policy environment changes, from relief, emergency to a long-term structured employment-generation programme. The approach should link economic growth, employment and investment policies. Low-cost housing projects must aim to ensure that infrastructure is planned around local needs rather

than vice-versa. The Government needs to establish a long term programme on employment intensive construction. This cannot be established overnight, and will take some years to grow into a national programme.

5.10 Hypothesis

The results that were expected at the start of the research do not correlate with the actual findings discovered in the research. According to the above text, it is clearly visible that there is despite of all the negative aspects also very positive outcomes in labour intensive projects. It was initially thought that labour intensive projects are more expensive but it is not the case. Positive outcomes however are only possible through consistent supervision and experienced persons in the project team.

5.11 Conclusion

Public spending on infrastructure construction and maintenance can be a valuable policy tool to provide economic stimulus during recessions. “As long as quality and cost-effectiveness are not compromised, labour-intensive approaches to infrastructure development can also be an important instrument for economic growth.” (World Bank, 1994) When public spending on infrastructure is not widely deployed, it can crowd out more productive investment in other sectors.

Emerging contractors in the Nelson Mandela Metropole consist of people who are young, mostly women and who are fairly exposed to formal education. The construction industry is an important player in the economy of South Africa. The government’s white paper on the construction industry spells out the government’s strategy to empower the previously disadvantaged through the construction industry in South Africa. The objective of the government is to make the construction sector in South Africa nationally, regionally and globally competitive.

Nevertheless, this study has shown that in order for the government to achieve its goals in terms of the white paper on the construction industry, a lot of work is yet to be done amongst the emerging contractors. Special training programs in construction business management, tendering processes and financial management are key areas in which the emerging contractors can be assisted.

CHAPTER 6: Conclusion

6.1 Background

The past legislation led to the result that a large portion of our population does not acquire the skill nor had the opportunity to effectively participate in South Africa's economy and to earn a living. This led to the creation of a public works programme to help previous disadvantaged people to learn to acquire skills and to attribute to the economy of South Africa.

Labour intensive projects are a fairly new system introduced in South Africa. Labour intensive projects therefore calls for much extra administration from all parties involved in these projects. In above text positive and negative factors have been investigated and dealt with.

The public works programme involves creating temporary, and in some cases permanent work for unemployed using public expenditure. According to the minister of infrastructure in the public works sector, most of the unemployed are unskilled people and the emphasis is on relatively unskilled work opportunities. All of the work opportunities generated by the Extended Public Works Programme are therefore combined with training, education or skills development, with the aim of increasing the ability of people to earn an income once they leave the programme. Together with the SETA's, the Department of Labour coordinates the training and skills development aspects of the programme.

"As part of the contribution to the income of the poor, the target for 1-million work opportunities through the Expanded Public Works Programme was attained in 2008, a year earlier than envisaged in the 2004 electoral mandate. This has created the possibility massively to expand this programme and improve its quality". (Sona,2009)

One of the ways the government was able to successfully reach their goal of 1 million work opportunities was to implement labour intensive projects to further produce work to the government.

Today labour intensive projects and labour intensive tendering is a very common procurement method and most of the municipal contracts makes provision for this.

This now brings it back to the main problem; will the implementation of labour intensive building project be successful or will it be regretted in the near future?

During the history of labour intensive projects certain main concerns were raised. One solution that came forward in many instances is successful management and communication in labour intensive projects. This is essential in every project, and with the one weak link in the project team there is a big chance of failure.

6.2 Summary

In above research many problems have been addressed that leads to unsuccessful labour intensive projects. It is also noted these problems can be minimised through thoughtful planning and management.

Some of the labour intensive projects did not complete in time or in the proposed construction period. This is due to many different reasons. It is seen that a lot a pressure is transferred to the main contractor of the project. To ensure a successful project, the main contractor must ensure that all resources given to him are used in the most productive manner.

The financial aspects of a labour intensive project are of major importance. Funding keeps the main contractors cash flow steady throughout the project and also ensures that payment can be made the his subcontractors. However, if the money is not used in an efficient way and there is a lack of planning, there is a good chance that the contract will end in a delay or complete failure.

A labour intensive project consists of much more administration then a traditional contract. The government provides much more “rules” to comply with and thus making it more technical for both the contractor and the employer.

The outcome of a project is also dependant on the amount of supervision from the professional team “For a successful national programme it is necessary to educate engineers about employment creation and train them in the specific skills required in planning, control and evaluation of large labour-intensive programmes. In time, and experienced technician or technologist should be able to do this level of work releasing the engineer for engineering and planning.” (McCutcheon, 1994)

In early phases the emphasis was upon the creation of employment opportunities for unskilled labour. Over the past decade it has become clear that in order to use labour productively it is necessary to train a skilled supervisor who is technically and organisationally competent and thus able to direct and motivate the workers under his or her control. Low-cost housing projects in South Africa should change as the policy environment changes, from relief, emergency to a long-term structured employment-generation programme. The approach should link economic growth, employment and investment policies. Low-cost housing projects must aim to ensure that infrastructure is planned around local needs rather than vice-versa. The Government needs to establish a long term programme on employment intensive construction. This cannot be established overnight, and will take some years to grow into a national programme.

6.3 Conclusion

In the above research many problems have been addressed that leads to unsuccessful labour intensive projects. It is also noted these problems can be minimised through thoughtful planning and management.

Most of the labour intensive project ends in a result of late completion. This is due to many reasons. The government places many “rules” and requirements on the project to ensure a successful outcome. However, many of these requirements lead to a failure of the project especially late completion. Very seldom a contractor will take the responsibility of his actions and the blame gets send through the whole project team. If a clear and unambiguous guideline can be set up for emerging contractors, there will be less confusion in the project.

Throughout the study many reasons for delays in a labour intensive project came forward. One aspect remains certain; a labour intensive project creates much more room for error and if effective management is not in place, a project will end up months after the planned completion date.

Certain requirements cannot be bypassed, for instance the appointment of unskilled labour that must fill the shoes of heavy machinery. But through sufficient planning from the whole project team, a successful outcome is possible.

It is visible that a labour intensive project must receive a lot of attention. If not well managed the project will lack in performance and cause a delay in construction time.

It is also clear that a labour intensive project can benefit to the community in many different ways. It also creates a sense of hope to the community and in many projects made a difference in many of the local's lives.

The initial thought was that a labour intensive project is more expensive than a traditional construction project, but according to above research, a traditional project is actually more inexpensive. Not only on the construction costs but also creates an asset for the local community. Certain projects however were not well managed at all. The conclusion can be stated that a labour intensive project, if well managed, will be successful and sustainable to the community and the whole country. "As long as quality and cost-effectiveness are not compromised, labour intensive approaches to infrastructure development can also be an important instrument for economic growth" (World Bank, 1994)

The quality of labour intensive contracts is at the moment not sufficient. However, there is a comprehensive plan and management system in place for the future implementation of these projects. At the moment the situation in South Africa is not up to standard and there is much room for improvement.

The hypothesis is correct. Again, through management and sufficient supervision these projects can be successfully implemented. South Africa does have the potential and if the disadvantages and problems can be minimized there is a bright future for labour intensive projects.

Despite of all the negative aspects certain projects also have very positive outcomes in labour intensive projects. Positive outcomes however are only possible through consistent supervision and experienced persons in the project team.

Public spending on infrastructure construction and maintenance can be a valuable policy tool to provide economic stimulus during recessions. "As long as quality and cost-effectiveness are not compromised, labour-intensive approaches to infrastructure development can also be an important instrument for economic growth." (World Bank, 1994) When public spending on infrastructure is not widely deployed, it can crowd out more productive investment in other sectors.

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disadvantaged through the construction industry in South Africa. The objective of the government is to make the construction sector in South Africa nationally, regionally and globally competitive.

Nevertheless, this study has shown that in order for the government to achieve its goals in terms of the white paper on the construction industry, a lot of work is yet to be done amongst the emerging contractors. Special training programs in construction business management, tendering processes and financial management are key areas in which the emerging contractors can be assisted.

According to the evidence presented by the sub-problems and successful testing of the hypotheses it can be determined that labour intensive project can be a success in the future. Despite of the many negative aspects there is still hope for these projects and can be accomplished by the full participation of the whole project team.

6.4 Suggestions for further research.

- The way forward in regards to the funding mechanism of Labour Intensive projects

- Government goals in terms of Labour intensive Projects

- The procurement system for Labour Intensive Projects

- Labour Intensive projects in an International point of view

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