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CRITICAL ANALYSIS OF MODIMOLLE LOCAL MUNICIPALITY LABOUR-INTENSIVE PROJECTS (2002–2007)

Thabo Zacharia Hlabela

A research report
submitted to the
Faculty of Engineering and the Built Environment
of the
University of Witwatersrand
in partial fulfilment of the requirements
for the degree of
Master of Science in Engineering

Johannesburg

March 2012

DECLARATION

I declare that this research report is my own, unaided work. It is being submitted in partial fulfilment of the Degree of Master of Science in Engineering in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

…….....…….....

T Z Hlabela

Signed in **Johannesburg** on the **30th** day of **March 2012**

ABSTRACT

The 2002 Stellenbosch African National Congress Policy Conference discussed and agreed on a short- to medium-term programme aimed at reducing unemployment and alleviating poverty. Subsequently, the Republic of South Africa's ruling political party, the African National Congress, announced the Expanded Public Works Programme through President Thabo Mbeki's "State of the Nation" address in February 2003. The President's announcement endorsed the Government's adoption of the position towards correcting unemployment levels in South Africa. However, during November 2002 Modimolle Local Municipality (formerly known as "Nylstroom") had already embarked on an on-the-job labour-intensive programme. The programme was intended to introduce and implement labour-intensive construction methods in all the Municipality's infrastructure projects. The above background formed the basis for the purpose of this research project which aims to discuss, analyse and evaluate Modimolle Local Municipality's nine (9) – six (6) water projects (including the pilot project) and three (3) sewer projects – labour-intensive infrastructure projects undertaken between November 2002 and March 2007 in comparison with experience gained on similar projects in Africa, with specific reference to their contribution to job creation. The research found that the success of Modimolle's programme was due to long-term political support; adequate training; the availability and willingness of unskilled people to be employed as casual labourers; the pilot project that was carried-out before the main or core programme, and the ability to transfer experience and lessons learnt from the pilot project to the other projects. The research concludes that labour-intensive construction methods are economically feasible for water and sewer infrastructure projects and can reduce unemployment and alleviate poverty.

KEYWORDS:

Expanded Public Works Programme, Modimolle labour-intensive work programme, construction projects, construction methods.

This research report is dedicated to my late father,

Mogoba Nanana Albert Hlabela,

from whom I have learnt not to give up, his parental guidance, financial support throughout, the father figure and the role model he played in my career life.

The role my mother,

Mpho Maphuthi Agnes Hlabela,

played is also highly appreciated; it is indeed a blessing to have a loving and supporting mother like her.

The support I received from my other half,

Patience.

It is through her patience and encouragement that I have finally made it.

Last, but not least, the support I received from my three sons,

Refentše, Reatlegile and Realeboga,

and their sister,

Maphuthi,

is highly appreciated.

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TABLE OF CONTENTS

DECLARATION I

ABSTRACT II

ACKNOWLEDGEMENTS IV

TABLE OF CONTENTS V

LIST OF FIGURES XIII

LIST OF TABLES XIV

ABBREVIATIONS, ACRONYMS AND GLOSSARY XV

CHAPTER 1: INTRODUCTION 1

1.1 BACKGROUND AND STATEMENT OF THE PROBLEM 1

1.2 LABOUR–INTENSIVE CONSTRUCTION 2

1.3 SCOPE OF THE STUDY AND METHODOLOGY 3

1.3.1 SCOPE OF THE STUDY 3

1.3.2 METHODOLOGY 3

1.4 OBJECTIVES AND PURPOSE OF THE RESEARCH 4

1.4.1 MAIN OBJECTIVES OF THE RESEARCH 4

1.4.2 PURPOSE OF THE RESEARCH 5

1.5 LIMITATIONS OF THE STUDY 5

1.6 STRUCTURE OF THE RESEARCH REPORT 5

CHAPTER 2: LITERATURE REVIEW FROM A REGIONAL PERSPECTIVE 7

2.1 INTRODUCTION 7

2.2 LABOUR-INTENSIVE PROJECTS IN AFRICA 7

2.2.1 MALAŴI 7

2.2.2 LESOTHO 9

2.2.3 GHANA 12

2.3 NOTEWORTHY LABOUR-INTENSIVE PROJECTS 14

2.3.1 KENYA: THE RURAL ACCESS ROADS PROGRAMME 1974 14

2.3.2 BOTSWANA: THE DISTRICT ROADS LABOUR-INTENSIVE IMPROVEMENT AND MAINTENANCE PROGRAMME 20

2.4 DISCUSSION AND CONCLUSIONS 23

CHAPTER 3: LITERATURE REVIEW FROM A SOUTH AFRICAN PERSPECTIVE.....25

3.1 INTRODUCTION 25

3.2 THE STRATEGIC OIL FUND (OCTOBER 1991 TO MARCH 1994) 26

3.2.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME 26

3.2.2 CRITIQUING THE METHODOLOGY 28

3.2.3 SHORTCOMINGS WITH RESPECT TO THE STRATEGIC OIL FUND 28

3.2.4 EXTENT TO WHICH THE STATE PRESIDENT'S REQUIREMENTS WERE MET 30

3.2.5 MAIN FINDINGS AND RECOMMENDATIONS ON THE STRATEGIC OIL FUND 31

3.2.6 CONCLUSIONS 32

3.3 THE COMMUNITY-BASED PUBLIC WORKS PROGRAMME (1994 TO 1996) 32
3.3.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME 32
3.3.2 SUMMARY OF SHORTCOMINGS 35
3.3.3 CONCLUSIONS 35
3.4 THE EXPANDED PUBLIC WORKS PROGRAMME PHASE 1 (APRIL 2004 TO MARCH 2009) 36
3.4.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME 36
3.4.2 SHORTCOMINGS WITH RESPECT TO THE EXPANDED PUBLIC WORKS PROGRAMME PHASE 1 38
3.4.3 MAJOR CONCLUSIONS FROM NATIONAL STUDIES ON THE EPWP 41
3.4.4 INFRASTRUCTURE AND LABOUR INTENSITY 45
3.4.5 CRITIQUING THE METHODOLOGY 47
3.5 CONCLUSIONS 48

CHAPTER 4: MODIMOLLE LOCAL MUNICIPALITY AND THE PILOT PROJECT.....53
4.1 BACKGROUND 53
4.1.1 INTRODUCTION TO MODIMOLLE LOCAL MUNICIPALITY 55
4.1.2 EXISTING INFRASTRUCTURE 57
4.1.3 ROAD INFRASTRUCTURE 60
4.1.4 WATER INFRASTRUCTURE 61
4.1.5 SANITATION INFRASTRUCTURE 62
4.1.6 ELECTRICITY INFRASTRUCTURE 62
4.2 THE PROCESS OF IDENTIFYING, BUDGETING FOR AND IMPLEMENTING PROJECTS 62
4.2.1 ANALYSIS PHASE 63
4.2.2 STRATEGY DEVELOPMENT PHASE 63

4.2.3 SPECIAL DEVELOPMENT FRAMEWORK PHASE 63

4.2.4 IMPLEMENTATION PHASE 63

4.2.5 FINANCIAL PLANNING PHASE 63

4.2.6 ORGANISATION STRUCTURE PHASE 64

4.2.7 REVIEW PHASE 64

4.3 MODIMOLLE LOCAL MUNICIPALITY PILOT PROJECT (NOVEMBER 2002 TO JUNE 2003) 65

4.3.1 BACKGROUND AND BRIEF ABOUT THE PROJECT 65

4.3.2 APPROVAL OF IDP AND MUNICIPAL BUDGET 65

4.3.3 PROCESS OF IMPLEMENTING THE FIRST-EVER, LABOUR-INTENSIVE PROJECT (PILOT PROJECT) IN MODIMOLLE 66

4.3.4 PROJECT IMPLEMENTATION PLAN PHASES 67

4.3.5 SYNOPSIS OF PROJECT MILESTONES 70

4.3.6 OUTLINING AND DETAILING OF DUTIES FOR THE PILOT PROJECT 71

4.3.7 TEAM OUTPUT DURING IMPLEMENTATION 71

4.3.8 CHALLENGES THAT FACED THE PILOT PROJECT 72

4.3.9 GAPS IDENTIFIED DURING THE PILOT PROJECT 73

4.3.10 EVALUATION OF PILOT PROJECT OBJECTIVES 74

4.3.11 IDENTIFYING INDICATORS OF SUCCESS 79

CHAPTER 5: MODIMOLLE LOCAL MUNICIPALITY LABOUR-INTENSIVE PROJECTS.....81

5.1 PHAGAMENG EXTENSION 7 LETŠEMA WATER AND SEWER PROJECT (APRIL 2003 TO MARCH 2004) 81

5.1.1 PROJECT DETAILS 82

5.1.2 BACKGROUND TO THE PROJECT 82

5.1.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR 84

5.1.4. THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 90

5.1.5 CHALLENGES ENCOUNTERED ON THE PROJECT 94

5.1.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 95

5.1.7 OVERALL PROJECT OUTPUT 98

5.2 PHAGAMENG EXTENSION 8 LETŠEMA WATER AND SEWER PROJECT (APRIL 2004 TO JUNE 2005) 99

5.2.1 PROJECT DETAILS 99

5.2.2 BACKGROUND TO THE PROJECT 100

5.2.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR 101

5.2.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 106

5.2.5 CHALLENGES ENCOUNTERED ON THE PROJECT 109

5.2.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 111

5.2.7 OVERALL PROJECT OUTPUT 112

5.3 MABATLANE (LESEDING EXTENSION 2) LETŠEMA SEWER RETICULATION PROJECT (MARCH 2005 TO FEBRUARY 2006) 113

5.3.1 PROJECT DETAILS 113

5.3.2 BACKGROUND TO THE PROJECT 113

5.3.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES 114

5.3.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 117

5.3.5 CHALLENGES ENCOUNTERED ON THE PROJECT 120
5.3.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 120
5.3.7 OVERALL PROJECT OUTPUT 121
5.4 MABATLANE EXTENSION 4 LETŠEMA WATER PROJECT (OCTOBER 2005 TO JUNE 2006) 122
5.4.1 PROJECT DETAILS 122
5.4.2 BACKGROUND TO THE PROJECT 122
5.4.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR 123
5.4.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 126
5.4.5 CHALLENGES ENCOUNTERED ON THE PROJECT 128
5.4.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 129
5.4.7 OVERALL PROJECT OUTPUT 129
5.5 PHAGAMENG EXTENSION 9 LETŠEMA WATER PROJECT (OCTOBER 2005 TO JUNE 2006) 130
5.5.1 PROJECT DETAILS 130
5.5.2 BACKGROUND TO THE PROJECT 130
5.5.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR 131
5.5.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 134
5.5.5 CHALLENGES ENCOUNTERED ON THE PROJECT 136
5.5.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 136
5.5.7 OVERALL PROJECT OUTPUT 137

5.6 MODIMOLLE TOWN LETŠEMA WATER PROJECT: REPLACEMENT OF ASBESTOS-CEMENT PIPES WITH UPVC PIPES (JULY 2005 TO MARCH 2007) 138

5.6.1 PROJECT DETAILS 138

5.6.2 BACKGROUND TO THE PROJECT 138

5.6.3 ANALYSIS OF THIS PROJECT IN LINE WITH COUNCIL'S OBJECTIVES 139

5.6.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT 143

5.6.5 CHALLENGES ENCOUNTERED ON THE PROJECT 144

5.6.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES 145

5.6.7 OVERALL PROJECT OUTPUT 145

CHAPTER 6: ANALYSIS OF THE MODIMOLLE PROJECTS 148

6.1 FACTORS THAT CONTRIBUTED TO THE SUCCESS OF THE MODIMOLLE LABOUR-INTENSIVE PROJECTS 148

6.2 ACHIEVEMENTS OF MODIMOLLE LABOUR-INTENSIVE PROJECTS AS AT MARCH 2007 151

6.2.1 POSITIVE INTERVIEWS FROM VARIOUS ROLE PLAYERS 152

6.3 EXTENT TO WHICH COUNCIL'S OBJECTIVES WERE MET 155

6.4 SHORTCOMINGS OF THE MODIMOLLE PROJECTS 158

6.4.1 NEGATIVE INTERVIEWS FROM VARIOUS ROLE PLAYERS 159

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS ..160

7.1 CONCLUSIONS 161

7.2 LESSONS LEARNT 163

7.3 RECOMMENDATIONS 164

7.4 FURTHER RESEARCH 166

REFERENCES 167

ANNEXURE A: RESUMÉ OF MS MPHO LEKOLOANE 171

ANNEXURE B: EXAMPLE OF A TIMESHEET MARCH 2005 172

ANNEXURE C: EXAMPLE OF A TIMESHEET JULY/AUGUST 2006.....174

LIST OF FIGURES

Figure 4.1:	Map of South Africa, showing Limpopo Province and Modimolle Local Municipality (the study area) (not to scale)	54
Figure 4.2:	Hand-held, locally made steel compactor	76
Figure 5.1:	A cross-section of a sewer trench excavated in steps to prevent trench-bank overloading and the trench collapsing	96
Figure 5.2:	From left: the Corporate Director, Chief Financial Officer, Social Director, Municipal Manager and Technical Director of the Modimolle Management Team holding the Modimolle Vuna Award cheque	98
Figure 5.3:	From left: the Modimolle Mayor, Technical Director, Project Manager and the Minister of Labour during their visit to Modimolle on 10 May 2005	103
Figure 5.4:	The TLB assisting with manhole construction	110
Figure 5.5:	Deep excavation at Phagameng Extension 8 using the TLB	110

LIST OF TABLES

Table 2.1:	Comparison of successful completed programmes in Africa	24
Table 3.1:	South African perspective: comparison of three major programmes implemented in South Africa	52
Table 4.1:	Road infrastructure and backlog as at May 2009	57
Table 4.2:	Water infrastructure and backlog as at May 2009	58
Table 4.3:	Sewer infrastructure and backlog as at May 2009	59
Table 4.4:	Electricity infrastructure and backlog as at May 2009	60
Table 4.5:	Phagameng Extension 5 and 6 project output as at 31 March 2003	78
Table 4.6:	Phagameng Extension 5 and 6 project cost breakdown as at 31 March 2003	78
Table 5.1:	Phagameng Extension 7 project output as at 31 March 2004	88
Table 5.2:	Phagameng Extension 7 project cost breakdown as at 31 March 2004	88
Table 5.3:	Phagameng Extension 8 project output as at 30 June 2005	105
Table 5.4:	Phagameng Extension 8 project cost breakdown as at 30 June 2005	106
Table 5.5:	Leseding project output as at 28 February 2006	116
Table 5.6:	Leseding project cost breakdown as at 28 February 2006	116
Table 5.7:	Leseding project team balancing as at March 2005	118
Table 5.8:	Mabatlane Extension 4 project output as at 30 June 2006	125
Table 5.9:	Mabatlane Extension 4 project cost breakdown as at 30 June 2006	126
Table 5.10:	Phagameng Extension 9 project output as at 30 June 2006	133
Table 5.11:	Phagameng Extension 9 cost breakdown as at 30 June 2006	134
Table 5.12:	Modimolle Town Letšema water project output as at 31 March 2007	142
Table 5.13:	Modimolle Town Letšema water project cost breakdown as at 31 March 2007	142
Table 5.14:	Compliance with Council objectives: indicators of success	147
Table 6.1:	Modimolle: comparison of all completed water and sewer projects	157

ABBREVIATIONS, ACRONYMS AND GLOSSARY

ANC	African National Congress. The African National Congress is the ruling party in the Republic of South Africa. Their Policy Conference is held once every five years and this is where the election of their President takes place, who, after the country's next national elections, is elected to be State President of South Africa. It is at this conference where the ANC puts together their five-year plan and strategies to deliver over the next five years until their next conference.
CBPWP	Community-Based Public Works Programme
COUNCIL	Modimolle Political and Administration Structure
EPWP	Expanded Public Works Programme
IDP	Integrated Development Plan
KRARP	Kenya Rural Access Roads Programme
Modimolle	Modimolle (formerly known as "Nylstroom") is a Category B municipality in Limpopo Province, which is within the Waterberg District Municipality. This municipality is located ~130 km north of Pretoria along the N1 and ~155 km to the south-west of Polokwane.
NGO(s)	Non-Governmental Organisation(s)
SMME(s)	Small Micro and Medium Enterprise(s)
TBVC	Four pre-1994 independent states within the Republic of South Africa, namely: Transkei, Bophuthatswana, Venda and Ciskei. These states were subsequently re-incorporated into the Republic of South Africa.
TLB	Tractor/Loader/Backhoe

CHAPTER 1:
INTRODUCTION

1.1 BACKGROUND AND STATEMENT OF THE PROBLEM

In 2002 the level of unemployment and concomitant poverty in the Republic of South Africa stood at 30.4 %, with Limpopo Province being in the lead at 34.1 % (SSA 2009: Labour Force Survey Historical Revision: September Series, 2000 to 2007). Apart from these problems of unemployment and poverty, the newly elected African National Congress (ANC) Government, which came into power in 1994, inherited infrastructure backlogs, illiteracy and a lack of skilled personnel from its predecessor. In 1994 the Government of National Unity embarked on programmes aimed at addressing these problems by introducing the Reconstruction and Development Programme during the 1994 fiscal year.

South Africa, as a developing country, has the responsibility to address the problem of unemployment, and to alleviate poverty and its attendant social consequences, while addressing infrastructure backlogs. The Nationalist Party Government (which was in power prior to 1994 before the Government of National Unity) was not completely indifferent with regard to the challenges of unemployment, poverty and infrastructure backlogs; hence there was an intervention by that Government which introduced the Strategic Oil Fund programme in April 1991 (funded from the sale of strategic oil reserves) which was aimed at addressing unemployment and alleviating poverty while addressing infrastructure backlogs.

Developing countries such as Kenya, Botswana, Malaŵi and Lesotho, for example, have embarked on labour-intensive construction methods to address their infrastructure backlogs, with the positive outcome of addressing unemployment and its attendant problems.

Prior to 1994 and post 1994 the South African Government has implemented large-scale, labour-intensive programmes such as the Strategic Oil Fund, the Reconstruction and Development Programme and many other programmes without success. The labour-intensive projects introduced by Modimolle Local Municipality

in November 2002 won them first prize in the 2003/2004 Municipal Vuna Award;[1] they were the Limpopo provincial winner of the 2006/2007 Govan Mbeki National Award[2] and they received third prize nationally in the 2006/2007 Govan Mbeki National Award. Modimolle's labour-intensive programme is among the few that have been considered successful in South Africa. This project report intends to describe and evaluate this programme.

1.2 LABOUR–INTENSIVE CONSTRUCTION

"Labour-intensive construction" is defined as the "economically efficient" use of as much labour as is technically feasible to produce as high a standard of construction as demanded by the specification without compromising time, cost and quality (McCutcheon, 1993, 1995, 2003).

The phrase *economically efficient*,[3] means it must be cost effective when compared with other methods of construction and also be within project budget.

As much labour as is *technically feasible*,[3] means – since emphasis is put on employing more labour – labour must not be used without considering the work they have to carry out and making sure that a "fair day's *wage*" versus a "fair day's *task*" principle is being applied.

To produce as high a standard of construction as demanded by the *specification*,[3] it means that quality should not be compromised for the sake of job creation, meaning compliance with specifications must not be affected by the method of construction.

It is therefore important that the implementation of projects using labour-intensive methods of construction must not compromise quality, quantity, time or budget (money) in the name of employing more labourers.

---

1 The Vuna Award is the award introduced by the then National Minister of Local Government, Mr Sydney Mufumadi, in which the municipalities competed against each other in each province according to different defined criteria and categories and the best municipality in each province and category would then compete with the winners from each of the nine (9) South African provinces at national level.

2 The Govan Mbeki Award is the award introduced by the then National Minister of Housing, Ms Lindiwe Sisulu, in which all the best municipalities in each province competed at national level and Modimolle obtained third prize out of 226 local municipalities in the country. For this award, focus was on service delivery and employment creation.

3 This is the researcher's interpretation based on the knowledge he acquired on the subject over 10 years.

1.3 SCOPE OF THE STUDY AND METHODOLOGY

1.3.1 SCOPE OF THE STUDY

Between November 2002 and March 2007 the Modimolle Local Municipality adopted a direct employment approach to implement nine (9) projects using labour-intensive methods of construction: six (6) water projects (including the pilot project) and three (3) sewer projects. This research report focuses on the information collected during the period November 2002 to March 2007 as the research was initiated within this period.

While the Municipality also carried out projects that involved contractor development and labour-intensive construction, the focus of this study is the nine (9) projects (including the pilot project) implemented by direct employment. During this period the researcher was in the employment of the Municipality in the role of Technical Director.

1.3.2 METHODOLOGY

The following resources were examined to compile this research report.

1) A study of literature on the topic of labour-intensive construction programmes undertaken in Africa, including journal articles and reports (Chapters 2 and 3).

2) An analysis – to identify the success factors – of the six (6) water and three (3) sewer projects that took place between 2002 and 2007 in Modimolle Local Municipality, Limpopo, South Africa.

3) Compilations of data from, for example, monthly reports which were at the researcher's disposal.

4) Interviews with one (1) general worker, one (1) supervisor, three (3) former Councillors of Modimolle municipality, 7 (seven) employees of Council (including a former University of Technology student), two (2) emerging contractors, two (2) individuals from materials suppliers, and one (1) consultant who was directly involved in the project.

5) The sample selected was purposive in that the interviewees were chosen specifically as they had been directly involved in several aspects of the Modimolle projects and were able to articulate their opinions clearly.

6) Prior to the interviews taking place, the interviewees were apprised of the purpose and need to obtain the information sought and they were assured of confidentiality.

7) Whilst it is hard to eliminate bias, one question was composed which was used for all interviews, irrespective of the level of education or literacy of the interviewee. The question posed was: "What is your view of the current "force-account system" used by the Modimolle Local Municipality to implement all their projects internally?"

8) Because the question asked was qualitative in nature, the researcher was able to probe (triangulate) the answers obtained from each interviewee to ensure reliability of the responses. Positive and negative answers were captured without modification.

9) Notes were taken during the interviews and transcribed immediately after each interview to ensure accuracy of the transcription.

1.4 OBJECTIVES AND PURPOSE OF THE RESEARCH

1.4.1 MAIN OBJECTIVES OF THE RESEARCH

The four (4) main objectives of the research were to:

1) analyse the pilot project and the training that was carried out in Modimolle Local Municipality prior to commencement of the programme,

2) document the successes, shortcomings and experiences of the projects,

3) detail the work carried out in labour-intensive (direct employment approach) client-based projects,[4] and to

4) describe, discuss, analyse and document the Modimolle labour-intensive construction projects to help strategic future labour-intensive programmes and projects in South Africa.

1.4.2 PURPOSE OF THE RESEARCH

The purpose of the research is to analyse the contribution of the direct employment approach, client-based in the Modimolle Local Municipality.

1.5 LIMITATIONS OF THE STUDY

The research is limited in that it discusses only the six (6) water projects (including the pilot project) and three (3) sewer projects implemented in the Modimolle Local Municipality within the period November 2002 to March 2007, even though there were other projects (such as roads[5] and stormwater projects, trenching for electricity projects, sidewalk projects, housing projects and taxi rank projects) which were also implemented within this period using labour-intensive methods of construction.

1.6 STRUCTURE OF THE RESEARCH REPORT

The first chapter provided the definition of the term "labour-intensive construction". It also stated the objectives and the purpose of the research.

Chapter 2 contains a literature survey from a regional perspective of labour-intensive programmes in Malaŵi, Lesotho, Ghana, Kenya and Botswana which will be evaluated and analysed. Best practices, reasons for successes and lessons learnt from

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4 The "direct employment approach" is an approach where the main participants are the Client and the community (Mthombeni 1996; McCutcheon 1993), this method is also known as "direct employment by employer". Emphasis on this approach is put on the Client having in-house capacity. According to Gertzen (1999), the Client keeps the community liaison, planning, design, documentation and execution of the project within his organisation while the community is directly involved as individual workers, managerial support, capacity building and financial control are all handled by the Client in this approach.

5 When the Council of Modimolle Local Municipality adopted the use of labour-intensive construction methods to be implemented also on all their internal roads, interlocking paving blocks were adopted as a surfacing layer, which in itself is labour intensive.

these major programmes will be outlined. This information will then be used in Chapters 4 and 5 when analysing the labour-intensive projects in Modimolle Local Municipality.

Chapter 3 focuses on literature from labour-intensive programmes in South Africa including a detailed discussion on the Strategic Oil Fund and the Community Based Public Works Programme (CBPWP) as well as the Expanded Public Works Programme (EPWP).

Chapter 4 contains a discussion and analysis of the pilot (water) project that took place in Modimolle Local Municipality between November 2002 and June 2003 and the training, focusing on the planning phase that took place within this period and evaluating it in line with experiences elsewhere in Africa.

Chapter 5 provides an analysis of the five (5) water projects and three (3) sewer infrastructure projects implemented in Modimolle Local Municipality between April 2002 and March 2007. These projects are analysed and evaluated and compared with successful programmes elsewhere in Africa (Chapter 2).

In Chapter 6 an overall analysis is provided of the findings from the pilot project and the evaluated projects. The researcher discusses the factors that contributed to the successes of the Modimolle Local Municipality labour-intensive projects.

Chapter 7 is the final chapter of this research report and conclusions are drawn based on the success of the pilot project and all the evaluated projects. Thereafter, lessons learnt are documented and recommendations are given for future projects of a similar nature based on the experiences gained in Modimolle Local Municipality.

CHAPTER 2:
LITERATURE REVIEW FROM A REGIONAL PERSPECTIVE

2.1 INTRODUCTION

South Africa's national problem remains the high level of unemployment associated with the high percentage of unskilled labourers, poverty and a high crime rate. Additionally, there is a need for infrastructure development to reduce the current backlogs on basic infrastructure such as roads, storm water, water, sanitation, electricity and housing.

The chapter examines examples of labour-intensive projects from a regional perspective.

2.2 LABOUR-INTENSIVE PROJECTS IN AFRICA

From a regional perspective, several labour-intensive projects in Africa are discussed in order to provide a broader setting. Table 2.1 (at the end of this chapter) contains a summarised comparison of successful completed programmes in developing countries, with the focus being on Malaŵi, Lesotho and Ghana as compared with Kenya and Botswana.

2.2.1 MALAŴI

Malaŵi started with their first labour-intensive District Road Improvement and Maintenance Programme in the 1980s, followed by other poverty alleviation programmes such as the Malaŵian Social Action Fund in the 1990s (Quainoo, 2010:179). Both programmes are discussed more fully below.

2.2.1.1 DISTRICT ROAD IMPROVEMENT AND MAINTENANCE PROGRAMME

Quainoo (2010:184) notes the District Road Improvement and Maintenance Programme took more than a decade (1974 to 1990), signifying the need for a programme approach to poverty reduction through employment-intensive infra-structure development.

Malawi's District Road Improvement and Maintenance Programme was a huge success: by 1987 it had constructed over 5 000 km of good quality roads and transferred capacity to previously unemployed local residents (Quainoo, 2010:185). The programme outputs are summarised below (Quainoo, 2010:190):

Scope of work	Actual: >5 000 km constructed and maintained
Was there a pilot project?	Yes
Employment created	6 800 casual labourers 50 % female casual labourers employed at improvement sites
Wages	38 % of project cost

2.2.1.2 MALAWI SOCIAL ACTION FUND

Another labour-intensive construction project, the Malawi Social Action Fund, was divided into three phases. Phase 1 – a three (3) year programme – was implemented from 1995 to 1999; followed by Phase 2 from 1999 until 2003 (a five (5) year programme). Phase 3 commenced in 2003 and is scheduled to end in 2015 (a 12-year programme) (Quainoo, 2010:194).

Quainoo (2010:200-201) asserts the Malawi Social Action Fund's achievements were:

Scope of work	9 000 km of non-designated earth roads by the year 2001
Was there a pilot project?	Yes
Employment created	13 million man-days[6] Between 197 000 and 200 000 people were given direct employment Over 50 % of labourers employed were women, and simultaneously approximately 40 % were in the Project Management Committee board
Wages	~38 % of total road construction budget went to labour.

2.2.2 LESOTHO

Pama (1992:1) claims that in 1992 Lesotho had a total population of 1.7 million and an estimated labour force of approximately 0.6 million. A conservative estimate was that over 0.4 million people were either unemployed or underemployed.

Two (2) labour-intensive projects are summarised below.

2.2.2.1 LESOTHO LABOUR CONSTRUCTION UNIT

The Lesotho Labour Construction Unit was established as a pilot programme in 1977. The Ministry of Works and Municipal Authorities shared joint ownership and responsibility for the country's road network, with a total road network of more than 5 000 km (Quainoo, 2010:213).

Quainoo (2010:213) posits that under the former ministry responsibilities were decentralised as follows:

6 For consistency, the term "man-days" (and hence "man-years") has been used throughout this document even though source documents referred to used "people-days" or "person-days".

- The Roads Branch was responsible for all classified gazetted roads including the development and management (traffic control and maintenance inclusive) of all primary and secondary roads,
- The Lesotho Labour Construction Unit was responsible for upgrading over 2 000 km of rural earth roads to engineering standards, as well as their maintenance and re-gravelling using labour-based methods,
- The Civil Works Section was responsible for the construction and maintenance of over 1 500 km of local earth roads, tracks and footbridges to a lower standard than the Lesotho Labour Construction Unit roads using labour-based methods.

Quainoo (2010:221) notes the Lesotho Labour Construction Unit's achievements were:

Scope of work	2 200 km of road
Was there a pilot project?	Yes
Employment created	23 000 man-years In 1985 the annual average number of labourers employed was 1020, an increase from about 700 in 1980 Labour intensity increased from 40 % to 44 % between 1985 and 1997 compared with just 6 % for (contractor) equipment-based methods
Wages	60 % of total project cost as at 2002
Financial	Labour-based construction techniques were 25 to 35 % less expensive than conventional techniques
Training	A training facility was built.

2.2.2.2 DEPARTMENT OF RURAL ROADS

The government of Lesotho has since adopted a long-term (20 years) labour-intensive road construction plan to service 2 000 km of road by the year 2010 (Quainoo 2010:215).

Twenty (20) years of successful "force account" system[7] construction operations are indicative of the viability of a labour-intensive system when tightly monitored and controlled (Quainoo 2010:222).

Quainoo (2010:234) maintains a major challenge to the implementation of the 20-year expanded programme was insufficient capacity. This has resulted in the commencement of a contractor development programme under the Department of Rural Roads – a merger of the Lesotho Labour Construction Unit and the Civil Works Section – to train local residents in labour-based methods of road construction and maintenance to be responsible for the country's feeder road network. Quainoo (2010:234) observes the Lesotho Labour Construction Unit adopted a three-pronged strategy to overcome the situation: (i) training and development of small-scale contractors to execute all maintenance and rehabilitation road works; (ii) increasing labour-intensive teams by training more supervisors; and (iii) strengthening in-house capacity by orientation and employment of local consultants.

Quainoo (2010:238) notes that the Department of Rural Roads' achievements were:

Scope of work	>60 km of earth access roads to all-weather gravel roads
Was there a pilot project?	Yes
Employment created	>4 000 temporary jobs generated by 2006 23 000 man-years of employment created by 2002
Wages	60 % of project cost

[7] A "force account" system means permanent, salaried staff who were seconded to, or worked on, the project or programme.

Financial	The scope was achieved at a cost of LSL20.98 million
Training	Planned: 36 contractors Achieved: 24 contractors in 1997 in road maintenance and re-gravelling. Each batch of graduates was given a stretch of road network as a contract to execute. 24 additional contractors from Limpopo Province were trained in 2004 on road maintenance and re-gravelling (including Ms Lokoloane who worked on the Gundo Lashu and the Phagameng Extension 8 projects – see Sections 5.1.3.2 and 5.1.4.5, and Annexure A). The final achievement was 105 contractors trained to execute various labour-intensive road works by 2006.

Quainoo (2010:244) holds the two (2) successful programmes implemented before and after 1993 highlight the feasibility of operating two (2) delivery systems ("force account" and contracting). However, the contracting approach is the method preferred by several donor agencies because of perceived better cost effectiveness and efficiency.

2.2.3 GHANA

Ghana, a sub-Saharan West African country with an area of 238 500 km^2, in 2008 had >42 623 km of road network of which about 32 600 km are feeder or rural roads Quainoo (2010:128).

Quainoo (2010:129) suggests that years of lack of maintenance (due to budgetary constraints until the mid-1980s) resulted in the rapid deterioration of the good road network Ghana once possessed. To alleviate rural poverty and unemployment, Ghana launched its first Economic Recovery Programme in 1983 with key objectives to stimulate economic growth, promote Private-Sector investments, and reduce the role of the state in economic activities. The programme was first piloted in 1987 to 1989 to identify local institutional, technical and administrative modifications to the Kenyan model.

The Ghana Feeder Roads Programme (essentially a labour-based road improvement programme) started in 1986 with the main purpose of boosting agricultural productivity by way of providing access roads for farmers. Ghana embarked upon a small-contractor development approach. The Feeder Roads Programme was first piloted at Sefwi-Wiawso in the Western Region. The Department of Feeder Roads was forced to decentralise and manage the programme through 110 district authorities.

Quainoo (2010:145) states the Ghana Feeder Roads Programme's achievements were:

Scope of work	10 000 km of roads maintained as at 1997
Was there a pilot project?	Yes
Employment created	4.4 million man-days
Wages	There was creation of 34 000 jobs, for which wages accounted for about 40 % of the total project costs.
Financial	An average cost of USD4 885 per kilometre was achieved for maintenance and rehabilitation work and analysis indicated that labour-based methods of construction created approximately 15 times more jobs per kilometre than conventional methods executing similar works
Training	21 contractors after three (3) training courses. By 1992 the programme had trained 110 labour-based contractors and they had formed their own labour-based Contractors' Association. By the end of 1997, the programme had trained 93 small contractors with approximately 60 % (54 contractors) fully equipped for rehabilitation work. The remaining 40 % were used for specific maintenance. As at 1998, 639 personnel had been trained consisting of: 93 Small contractors 380 Supervisors and foremen 102 Department of Feeder Roads' foremen 64 Department of Feeder Roads' engineers

2.3 NOTEWORTHY LABOUR-INTENSIVE PROJECTS

Elsewhere in sub-Saharan Africa a contribution to resolve these problems was through the implementation of projects and programmes using labour-intensive methods of construction, with Kenya and Botswana being good examples. The topic of labour-intensive construction has been thoroughly researched and well documented (McCutcheon 1993, 1995, 2003). The Malawi, Lesotho and Ghana labour-intensive programmes are analysed and compared with the Kenya and Botswana labour-intensive programmes in Table 2.1 (at the end of this chapter).

Lessons learned from the Kenya and Botswana perspectives will be drawn for use as the criteria for analysing the labour-intensive projects in Modimolle Local Municipality. In the sections that follow a background and brief discussion of both programmes is given, and the achievements and the successes of these programmes will be discussed. This chapter concludes by summarising the factors that contributed towards the successes of these two programmes, followed by an overall tabulated summary in Table 2.1.

2.3.1 KENYA: THE RURAL ACCESS ROADS PROGRAMME 1974

2.3.1.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME

The Kenya Rural Access Roads Programme (KRARP) is the largest and longest-running programme, having commenced in 1974 (McCutcheon 1993). In 1970 the responsibility for construction and maintenance of all classified roads in Kenya was centralised within the Ministry of Works. In 1972 the International Labour Organisation was commissioned by the Government of Kenya to look into the unemployment problem in Kenya. The International Labour Organisation recommended the use of labour-intensive methods of rural road construction with the view to increasing employment.

McCutcheon (1993) notes that in 1974 the programme started as a pilot project. In 1975 the programme was initiated within the Special Project Branch, which was housed within the Ministry of Works, which had two district programmes: (1) a gravelling, culverting and bridge-building programme (this was not labour intensive)

and (2) the rural access roads programme (KRARP) which was labour intensive. In 1976 KRARP was initiated as a pilot project.

2.3.1.2 ACHIEVEMENTS OF THE PROGRAMME AS AT DECEMBER 1986

McCutcheon (1993) notes that the major achievement of KRARP has been the large-scale demonstration of the technical feasibility and economic efficiency of labour-intensive methods.

2.3.1.3 PROGRAMME OUTPUT AS AT DECEMBER 1986

McCutcheon (1993) posits as at December 1986, the programme output was:

Scope of work		
Total earth roads	Planned: 14 000 km (revised to 9 000 km) over eight (8) years	Achieved: 7 753 km (55 % of the original planned target or 84 % of the revised target) over seven (7) years
Gravelled roads	Planned: 14 000 km	Achieved: 5 812 km (42 % of the original planned target)
Roads not requiring gravel	462 km	
Earth (unpaved roads)	1 479 km	
Number of districts involved		
Number of districts	Planned: 23	Achieved: 26
Number of units	Planned: 74	Achieved: 46
Employment created		
Number employed at peak	14 450 casual labourers	
Number employed in construction	9 696 casual labourers	
Number employed for maintenance	4 754 casual labourers However, in December 1986, >5000 casual labourers were employed as maintenance contractors	

Years of employment created

Casual labourers	Planned: 84 000 man-years	Achieved: 70 000 man-years
Supervisory employment	Planned: 6 000 man-years	Achieved: 6 000 man-years

Training

Labourers trained	Planned: 3 441 over five years from 1976 to 1980	Achieved: 484 by 1980 and 1 013 by 1984 (trained for 2 % of the programme)
Breakdown of labourers trained	Of the 1 013: 41 as officers-in-charge 11 as maintenance inspectors 474 as overseers (construction, gravelling, structures, maintenance)	
Training facilities	The field Training Unit was replaced by a large, specially built Training School at Kisii	

Financial

Overall expenditure	USD35 million according to the World Bank evaluation at the end of 1984 (deflated to the 1975 price) or 62 % of the amount originally projected for about 56 % of the projected output (an ~11 % unit cost overrun)	
Investment	US35 million	USD24 million (69%) remained inside Kenya
Wages	56 % of the cost of the programme Since 1980 wages have varied from 60 to 71 % of the direct costs	

Quality of workmanship	In 1979, the Transport and Road Research Laboratory gave a favourable report. In 1982, an internal study expressed concern about the quality of almost half the roads. In 1983 a study by Sir Alexander Gibb and Partners revealed that of the 6 970 km which had been constructed to earth road standard, only 1 111 km (representing 15.94 % of the contract) required rehabilitation.

World Bank's reasons for KRARP's success

- An effective and successful organisation structure was planned for the headquarters, district and construction units. It was implemented in 23 districts through 44 labour-intensive construction units.
- Construction units, especially the earthwork subunits, managed to construct rural access roads in full compliance with the design standards, even though there was a low supply of skilled technical staff to provide continual guidance in the typical cross-section layout.
- Production rates of the exclusively labour-based construction units (that of formal-level construction units) achieved on average 67 % of the estimated 45 km per annum per unit and, for two (2) years, 100 %. The low accomplishment of 33 % on average of the planned production rate in the gravelling operation was mainly due to inadequate investigation of the availability of gravel material leading to the inappropriate selection of hauling equipment. Even in the gravelling operation, labour-based activities (such as quarrying, loading/unloading, and spreading of gravel) were not constraints to achieving the planned production rates.

2.3.1.4 WORLD BANK'S CONCLUSIONS FROM THE KRARP EXPERIENCE

McCutcheon (1993) asserts the World Bank stated that the following conclusions may be drawn from the experience of KRARP:

- The use of labour-based methods for construction and maintenance of rural roads in Africa is technically feasible and financially cost-effective.
- Labour-based methods can bring significant economic benefits, in addition to having a positive impact on income distribution and the quality of life in rural areas.
- Major donor involvement may be needed at the early stages of a project in order to convince local decision-makers that labour-based methods can be successful.

- A heavy initial input of technical assistance and a well-prepared training programme can have a high pay off in developing viable, self-sustaining institutions to manage rural transport infrastructure.
- The time necessary to achieve this result is, under the best of circumstances, likely to be longer than the normal World Bank project period of about five (5) years.
- To maximise unit productivity, adequate tools, fuel and spare parts for equipment should be procured and made available to field units in a timely fashion.
- Technical and financial management of a labour-based rural roads programme should be decentralised to as low a level as possible.
- To execute more equipment-intensive tasks (such as road gravelling or structures), small local contractors may be used more effectively than a "force account" system.
- Following the execution of a labour-based programme of road improvements, it is relatively easy to initiate a "length-man" system for routine maintenance of rural roads.
- Local involvement in planning for a rural roads programme will facilitate its execution and will strengthen local capacity for development planning more generally.
- A monitoring and evaluation programme, though expensive, offers additional opportunities to support the development of local institutions for more effective planning in the future.
- The [World] Bank can play an important role as a catalyst for innovative programmes, but the active participation of several different donors may be needed to sustain such a programme over time.

McCutcheon (1993) opines the major reasons for the success of the programme were:

- The initial intellectual assessment of the feasibility of using labour-intensive methods was sound: productive employment was created which resulted in good quality roads.
- Technical aspects received concentrated alteration during the pilot project and the early stages of the national programme through the medium of a Technology Unit which also developed all the systems and the training material for the programme.
- Organisation was strong and there was a balance between the decentralisation essential for grassroots operation and the centralisation required for a national programme: initial selection of roads and construction itself were decentralised, but overall planning, budgeting, monitoring, systems control and training were centralised. The re-porting and monitoring system which was worked out during the pilot project was effective, while the momentum and capacity existed to ensure that it was done thoroughly; eventually it could not sustain its dual role and had to be revised.
- Training was extensive and good at what it set out to do, namely, the training of site supervisors and officers in charge of several teams of workers, vehicle and tractor drivers.
- There was long-term political support from key senior officials, first within the Ministry of Works, and later within the Ministry of Transport and Communications.
- There was long-term financial commitment from the Government of Kenya and the eight (8) donor agencies.
- There was good co-ordination between the Government, the Programme and the eight (8) donor agencies. This was partly facilitated by technical assistance from the International Labour Organisation. The co-ordination assisted the development among all parties of flexibility on points of contention to accommodate the views of one another to the

betterment of the programme as a whole. This flexibility on the part of Government, donors, programme and technical assistance was of crucial importance in a programme of this size extending over such a long period of time.

2.3.2 BOTSWANA: THE DISTRICT ROADS LABOUR-INTENSIVE IMPROVEMENT AND MAINTENANCE PROGRAMME

2.3.2.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME

McCutcheon (1992) opines, closer to South Africa – in Botswana – there is an example of a programme which was based upon District Councils which were a more decentralised institution than KRARP: the District Roads Labour-Intensive Improvement and Maintenance Programme: Local Government 34 (the LG 34 Programme). In 1974 the Botswana Government initiated a rural roads programme within the Ministry of Works and Communication. In 1980 a pilot project was initiated in the Central District for labour-intensive district road construction and maintenance.

Between 1980 and 1989 (a 10-year period), 145 people were trained for one (1) year as road builders, while 17 people received further training. The standard of construction was higher than Kenya's KRARP.

An animal-drawn (donkey) haulage system (McCutcheon 1992) – as opposed to an equipment-intensive operation – was adopted. By December 1986 District Council Labour-Intensive Road Units had been established in all nine (9) District Councils of Botswana.

2.3.2.2 ACHIEVEMENTS OF THE PROGRAMME AS AT MARCH 1990

McCutcheon (1992) notes the achievements of the District Council Labour-Intensive Road Units as at March 1990 were:

Scope of work	>2 000 km of roads upgraded	
Districts		
Number of districts	9	
Employment		
Number employed at peak	7 150 casual labourers at peak (July 1980 to December 1986)	
Number employed in construction	2 812 casual labourers of whom ~37 % were female	
Number employed for maintenance	935 casual maintenance workers	
Casual labourers	1 973 casual labourers (April 1986 to December 1986)	
Supervisory employment	180 gang leaders	
Training		
Labourers trained	145 supervisors and other senior staff trained by 1990	
Breakdown of labourers trained	81 gang-leaders 19 senior gang-leaders 21 maintenance team leaders 18 technical assistants 6 technical officers 40% women supervisors	
Training facilities :	Were established at the Road Training Centre of the Ministry of Works and Communications	
Financial		
Overall expenditure	BWP3.01 million (1979 to 1985)	
Investment	BWP3.01 million	BWP1.96 million was retained as wages (65 %)
Wages	Employment generated: >10 000 of which >70 % were casual labourers.	
Quality of workmanship	High quality of workmanship.	

The only sophisticated equipment was the four-wheel-drive utility vehicle which was essential for the senior supervisor and wage payments. Haulage was by donkey carts which were specifically designed for the programme (McCutcheon 1992). The carts

were locally manufactured and owned by the District Councils, while donkeys were hired from local people.

All construction and maintenance operations were carried out by labour-intensive methods. The roads were constructed by gangs of up to 25 labourers working under the strict control of supervisors (technical assistants). Senior gang leaders, who were responsible for 50 labourers (two (2) gangs), were also trained. One (1) supervisor was in control of 100 to 150 labourers (that is, four (4) to six (6) gangs). The supervisors were also trained. The process of selection, training and post-training of supervisors resulted in gang leaders who were technically competent and capable of understanding instructions from technical assistants.

After construction the roads were maintained by highly labour-intensive methods: that is, by an assistant road builder and 6 (six) to 10 maintenance labourers who were responsible for 6 to 10 km of road (McCutcheon, 1992).

2.3.2.3 LG 34 PROGRAMME'S SUCCESSES

According to McCutcheon (1992), the following factors contributed towards the successes of the LG 34 Programme:

- Government support or long-term political support.
- Training at different levels: both formal and informal (on-the-job) training.
- The availability and willingness of unskilled people to be employed as casual labourers.
- Community's involvement or buy-in which they ensured by appointing people in local areas where they were working.
- The pilot project that was carried out before the programme's implementation and lessons learned from KRARP.
- The support by the International Labour Organisation – both financially and technically.

2.4 DISCUSSION AND CONCLUSIONS

Labour-intensive construction has been advocated, explored and successfully implemented in Malaŵi, Lesotho, Ghana, Kenya and Botswana. This chapter has further highlighted that training has played a major role with regard to the success of these programmes. In all five (5) programmes a pilot project was first implemented and then followed by the programme that incorporated lessons learnt from the pilot project.

Based on the number of years of employment created, it is evident that labour-intensive methods of construction are a solution for countries with a high percentage of unemployed and unskilled people and can alleviate poverty. Labour-intensive construction methods have been extensively documented and, therefore, developing countries such as South Africa – with a high percentage of unemployment and poverty – have no reason not to replicate and learn from other countries how to implement such programmes successfully.

In conclusion, it is technically feasible and economically efficient to implement projects using labour-intensive methods of construction.

Finally, long-term political support and donors providing long-term financial commitment played a crucial role towards the success of both KRARP and the LG 34 Programme.

The success of the Kenya and Botswana programmes was adopted by the Modimolle Local Municipality, and Modimolle wanted to replicate these programmes.

Experience and lessons learnt provided a sound foundation and the base for Modimolle's labour-intensive programme. For Modimolle's successes these two programmes were used as a benchmark and, therefore, to evaluate Modimolle's projects, KRARP and the LG 34 Programme will be used for comparative purposes.

The next chapters focus on the local experiences and lessons learnt on labour-intensive construction methods, from a South African perspective – specifically in the Modimolle Local Municipality – while shortcomings will also be discussed together with lessons learnt.

Table 2.1: Comparison of successful completed programmes in Africa

Programme name	Was there a pilot project? (yes/no)	Pilot project duration (years)	Programme duration (years)	Number of casual labourers employed	Number of casual labourers trained	Quality of end product	Number of jobs created (man-days)	Money that went to labour as wages (%)	Total roads maintained and upgraded (km)
Malaŵi: Labour-intensive road construction programmes*	Yes	2	27	6 800	1 538	High	13.6 million	38	14 000
Lesotho: Labour-intensive road construction programmes*	Yes	3	20	4 000	105 small contractors	High	6 732	60	891
Ghana: Feeder roads programme*	Yes	2	8	34 000	639	High	4.4 million	51.4	10 000
Kenya: KRARP**	**Yes**	**1**	**12**	**14 450**	**1 013**	**High**	**20.1 million**	**56**	**13 565**
Botswana: LG 34 Programme**	**Yes**	**2**	**10**	**7 150**	**145**	**High**	**7 150**	**65**	**2 000**

CHAPTER 3:
LITERATURE REVIEW FROM A SOUTH AFRICAN PERSPECTIVE

3.1 INTRODUCTION

The previous chapter focused on literature with respect to labour-intensive programmes undertaken in countries outside South Africa's borders. This chapter focuses on labour-intensive experiences from a South African perspective. Labour-intensive methods of construction have been advocated and explored in South Africa prior to the introduction of the Expanded Public Works Programme (EPWP),[8] which will also be discussed shortly in this research report.

The previous Nationalist Party Government and the Government of National Unity initiated programmes with the aim of addressing the high level of unemployment and the poverty associated with it. However, prior to 2002, South Africa had not been successful in implementing any programmes of this kind.

This chapter focuses on the labour-intensive programmes implemented in South Africa before the 1994 general election and post-1994. These programmes will be discussed briefly and their methodology critiqued or shortcomings outlined and conclusions drawn from any lessons learned.

The three (3) major programmes implemented in South Africa that this research report will focus on are: the Strategic Oil Fund, the Community-Based Public Works Programme (CBPWP) and Phase 1 (April 2004 to March 2009) of the Expanded Public Works Programme (EPWP).

[8] After several attempts to implement national programmes which would generate more employment and generate skilled personnel, South Africa launched the EPWP in April 2004. The main aim of the EPWP was to create 1 million job opportunities in a five (5) year time frame in order to alleviate the increasing unemployment problem (EPWP 2004).

3.2 THE STRATEGIC OIL FUND (OCTOBER 1991 TO MARCH 1994)

3.2.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME

The Strategic Oil Fund was a programme established in 1991 by the government of South Africa funded from the sale of strategic oil reserves (Greyling 1994). Greyling notes the United Nations imposed an oil embargo on South Africa on account of the system of "apartheid" being enforced by the Nationalist Party South African government. The government decided to secure large quantities of oil reserves. As a result of several initiatives taken by the State in the reform process, the oil embargo was relaxed and the State regarded the reserves as being an unproductive form of investment which needed to be reconsidered.

The reserves did not contribute to South Africa's economic growth nor did they provide job opportunities. On 29 April 1991, during a budget debate in Parliament, the then State President, Mr FW de Klerk, in his speech, announced that the sum of approximately ZAR1 billion would be released from the sale of a portion of the oil reserves. These funds were to be used for specific projects within a special programme.

The President emphasised that because the funds were once-off, project applications had to be of a once-off nature and that the application of these funds was not in opposition to the State's firm control over expenditure. He further stated that all existing resources had to be used as effectively as possible and that communities had to be involved in all aspects, including project implementation and responsibility for the work carried out.

The programme was established to address the decline in economic growth and concomitant increase in unemployment and it focused mainly on the rural road infrastructure. Labour-intensive construction methods were stipulated. The implementation of the programme was based on the principles of the World Bank and the International Labour Organisation experience in terms of the quality of road construction, their cost effectiveness and the extent of job creation.

The programme was planned to commence in October 1991 and to end on 31 March 1994. During this period South Africa comprised 14 distinct states and provinces, namely:

- Four (4) provinces (Transvaal, Cape, Natal and the Orange Free State)
- Six (6) self-governing territories (KwaZulu, KaNgwane, KwaNdebele, Gazankulu, Lebowa and QwaQwa).
- Four (4) independent states (Transkei, Bophuthatswana, Venda and Ciskei – known as the TBVC).

The Department of Transport was given the task of co-ordinating the funds to be used for the road infrastructure. A sum of ZAR204.2 million was approved for the four (4) provinces and for five (5) of the self-governing territories (except for QwaQwa). A further ZAR45.5 million was approved in December 1991 and allocated to QwaQwa and the TBVC.

The projects in the four (4) provinces and five (5) of the six (6) self-governing territories commenced in October 1991. QwaQwa and the TBVC's project began in early 1992 as their budget was only approved on 4 December 1991.

By the end of March 1994, 95 % of the project was completed. In 1994 the Department of Transport announced that the funds could be rolled over to 1995, which resulted in projects being completed in 1995. The methods of construction used during the implementation of this programme differed from one province to another.

Greyling (1994) asserts labour-intensive construction programmes have been established successfully in other African countries for the following reasons:

- All the parties involved were fully committed to the objectives of their respective programmes (that is, government departments, funding agencies, technical experts and communities).
- A long-term national perspective was followed.
- The need for adequate preparation and analysis was identified early in their respective programmes.

- All the countries researched implemented pilot projects with extensive training programmes at all levels.
- The programmes were all gradually expanded to a national programme in line with the institutional and organisational capacities of the executing departments.

3.2.2 CRITIQUING THE METHODOLOGY

Even though labour-intensive construction methods were stipulated for this programme, many important aspects were ignored or neglected:

- No pilot project was implemented before the commencement of the programme.
- No time was allocated for training.
- The time allocated for the programme was appropriate for a *pilot* project, not for an *actual* programme.

3.2.3 SHORTCOMINGS WITH RESPECT TO THE STRATEGIC OIL FUND

Greyling (1994:218-223) notes:

- The concept of labour-intensive construction was not adequately promoted prior to the implementation of the programme. Consensus was not reached by all the parties involved with respect to conditions of employment and methods of construction, for example.
- The need for institutional development was ignored (pilot project).
- No technical research and development was carried out (pilot project).
- Generally, road authorities had little previous experience in the planning of labour-intensive road construction.
- Project costs were badly estimated, existing expertise was not consulted neither was international experience taken into account.
- The biggest failure of the inception and planning phases was that insufficient time was permitted to develop the necessary technology, establish training programmes (through pilot projects) and develop the institutions in general.

- Generally, supervision was inadequate because:
    a. There was no effective training for supervisors, overseers and gang leaders.
    b. Insufficient funds were budgeted for supervision and training.
    c. Insufficient power was granted to project managers by the works department to control plant and labour.
- The effort required to achieve full community participation was underestimated by the majority of project managers, contractors and state authorities.
- Payment by means of a fixed daily rate was preferred over incentive schemes for the following reasons:
    a. It was easy to organise.
    b. The payment system could be used for any form of work.
    c. It was traditionally done in this manner. Generally, there was a lack of awareness of the need for incentive payment schemes in labour-intensive construction.
- The fact that 60 % of the budget went to capital-intensive projects, indicates the failure of the cost-per-man index (to prioritise projects) and the general reluctance by provincial authorities to "go the labour-intensive route".
- The community-run projects were the least effective, as inadequate preparation (particularly training) took place beforehand.
- Projects were generally badly managed as a result of poor planning and little institutional development (including research and development).
- Experts, with extensive international experience in labour-intensive construction, were not consulted.
- Quality control was inadequately budgeted for. Appropriate simple field tests were generally not used.
- Although it was clearly stated that the funds were of a "once-off" nature, most road authorities did not consider how future maintenance requirements would be funded.
- Projects run by contractors were generally of better and more lasting quality. The opposite could be said for community-run projects.
- The quality of products was neither affected by the prevailing wage rate nor by the method of payment.
- The productivity of labour was generally lower than predicted by Coukis [in 1983]. It was also much lower than that achieved in established programmes. Insufficient time for experimentation,

planning and training in effective construction methods was allowed.

- There was very little improvement in production over time.
- Supervision costs were highly variable (between 8 and 37 % of total costs).
- The large variation in gravel road unit costs can again be ascribed to the lack of central guidance as well as to the fact that no research and development took place prior to and during the programme.
- The organisational structure used by the Department of Transport to co-ordinate the programme was ineffective.
- The lack of sufficient support in the Department of Transport resulted in emphasis being placed solely on expenditure rather than coupling it to physical progress.
- Where additional time was granted for 'planning', projects contributing to job creation were generally more successful than others.
- The variation in the figures for actual and planned employment generation is a direct result of the lack of previous experience in estimating the resources required, as well as the failure to consult experts.
- Some 60 % (ZAR150 million) of the allocation was spent on conventional capital-intensive projects. Labour-intensive construction, on its own, accounted for approximately ZAR20 million (or 8 % of the total allocation).
- A total of ZAR61.072 million (approx 25 %) was of direct benefit to the community (in terms of wages).

From the shortcomings noted by Greyling (1994), it is clear that there was a commitment from the previous government to address unemployment while addressing infrastructure backlog. However, authorities tasked with the responsibility to implement the projects labour intensively failed to fulfil the government's stipulated objectives as only 8 % of the total budget allocation of ZAR1 billion was used for labour-intensive construction methods.

3.2.4 EXTENT TO WHICH THE STATE PRESIDENT'S REQUIREMENTS WERE MET

Greyling (1994:223) observes:

- There was firm control over expenditure (accountability of funds).

- Economic growth and job creation were addressed only marginally and were effective only in the short term. The "alleviation of unemployment with specific reference to labour-intensive methods" was effective only in isolated cases.
- Projects were not of a "once-off" nature as most of the completed products required ongoing maintenance.
- Community participation was only partially addressed and, in general, the projects aimed at job creation were not cost effective.
- Insufficient time was allocated to "meet the needs" of the communities.

From Greyling's (1994) observations, it may be concluded that the State President's requirements were not met because, when the President announced that projects were of a "once-off" nature, the authorities responsible for maintenance after the projects were completed were supposed to make necessary adjustments to their respective operational and maintenance budgets to ensure that the newly constructed assets are maintained after hand-over and this did not happen.

3.2.5 MAIN FINDINGS AND RECOMMENDATIONS ON THE STRATEGIC OIL FUND

Greyling (1994:224-225) opines:

> A programme approach could not be taken for this initiative owing to its short duration. From its inception phase onwards, emphasis was placed on implementing projects as soon as possible, resulting in a general lack of planning. In future, a programme approach must be followed to ensure that general consensus is reached on the principles of labour-intensive construction. The lack of consensus in the Strategic Oil Fund programme is evident by the fact that <50 % of the funds were spent on projects with a substantial increase in employment per unit of expenditure. Only 8 % of the funds were spent on truly labour-intensive projects.
>
> The short-term nature of the programme did not allow for the necessary dissemination of improved methods of labour-intensive construction or organisation. Adequate research and development were also not possible. The duration of the programme was simply insufficient to allow the methods of construction used to become more efficient. The low level of labour productivity in general, throughout the programme, is evidence of this. Periods of up to three (3) years have been necessary in other countries with little experience in labour-intensive construction.

The Strategic Oil Fund programme did not achieve its objectives because, when compared with successful programmes such as KRARP in which labour-intensive construction alone accounted for 56 % of the total budget, only a paltry 8 % was achieved on this programme. The Strategic Oil Fund programme failed to start with pilot projects.

3.2.6 CONCLUSIONS

From the literature studied, it is clear that the Strategic Oil Fund failed to achieve its stated objectives, but there are lessons to be learnt from this programme. The lessons should be to do the opposite of all the shortcomings documented by Greyling (1994). Instead, the Kenya and Botswana experiences as documented by McCutcheon (1993, 1992) demonstrate that, for a programme of this nature to be successful, proper and adequate training is necessary, while a pilot project (technical research and development) is essential.

Despite all the negative and disturbing factors that arose during the Strategic Oil Fund programme, the Government of National Unity also embarked on job-creation programmes after taking over in 1994 and the next section focuses on the programme between 1994 and 1996.

3.3 THE COMMUNITY-BASED PUBLIC WORKS PROGRAMME (1994 TO 1996)

3.3.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME

In 1994 South Africa held its first democratic general election and a new Government (the Government of National Unity) was elected to lead South Africa. However, the Government of National Unity inherited from its predecessors a high level of unemployment, poverty, illiteracy, infrastructure backlogs and political problems. In an attempt to address these problems, the Government of National Unity introduced the Reconstruction and Development Programme (Mthombeni, 1996:143). This primary programme consisted of several secondary programmes that served as a delivery mechanism of the Reconstruction and Development Programme.

These primary programmes included, amongst others, the Independent Relief and Development Programme, the Employment Creation Programme and the National Public Works Programme. The National Department of Public Works was conceived as one of the most important role players and stakeholders in the delivery mechanism of the Reconstruction and Development Programme. The primary implementation of the National Public Works Programme was carried out through the Community-Based Public Works Programme (CBPWP). The objectives of the CBPWP were to use highly labour-intensive, capacity building for communities, and a high level of job creation through the construction of infrastructural assets.

Initially the CBPWP was to be a short-term programme with a focus on quick delivery and the piloting of approaches for the longer-term National Public Works Programme. With this programme the National Department of Public Works also wanted to demonstrate to government and the Private Sector how sustainable infrastructure backlog could be addressed with active involvement of communities without large-scale use of machinery and without lowering the standard of the end product (Mthombeni 1996:46).

As a delivery mechanism the CBPWP was to meet the expressed needs of the poorest communities for infrastructure and services. It was also recognised that, during the first year, the CBPWP could be used as a mechanism to capacitate provinces to implement development projects. It should also be noted that the Government of National Unity sub-divided South Africa into nine (9) provinces after the 1994 general elections.

The CBPWP consists of a governmental component through the Provincial Departments of Works in each of South Africa's nine (9) provinces, and a non-governmental component administered through NGOs that have a commendable record of management of projects and adherence to the principles of the CBPWP.

Mthombeni (1996:6;47) states that the Government of National Unity allocated ZAR250 million to the National Department of Public Works for the fiscal year 1994 to 1995. ZAR150 million was to be shared amongst the provinces in accordance with four (4) indices including levels of unemployment, poverty, need for skills and need for infrastructure. The remaining ZAR100 million was allocated to the four (4) NGOs chosen as they had a proven capacity to distribute funds.

Initially the CBPWP was a community-managed programme that was implemented by a CBPWP unit within each of the Provincial Departments of Works. Funds were allocated to the Provincial Departments of Works who were responsible for identifying projects from applications received from communities. The projects were chosen using the following CBPWP criteria: highly labour-intensive; community involvement in identifying needs and priorities; management and maintenance plans of assets created; usefulness of facilities and assets for improvement of community welfare; incorporation of training and capacity building in the programmes, and their design and implementation ability.

Funds were then transferred from the Provincial Departments of Works into community bank accounts for the planning and implementation of the projects. Communities were, in turn, responsible for appointing designers and trainers in order for these projects to be designed and then implemented by the community workforce. Mthombeni (1996:6;47) notes that for the NGO component the following four (4) NGOs were included: the Independent Development Trust's Community Employment Programme (ZAR70.25 million), the Siyakha Sugar Community Development Programme (ZAR12.0 million), Youth Supported Projects (formerly the National Youth Service Initiative) (ZAR8.9 million) and the Transkei Community School Building Trust (ZAR4.0 million).

The CBPWP had numerous organisational problems that developed from inappropriate administrative and institutional arrangements. Wage levels and other benefits were not clearly defined and CBPWP workers were contracted outside of formal employment conditions. Policies were often made without the flexibility to adapt to different circumstances and project types, for example, the Community Employment Programme recommended a very low blanket wage level as a vital "self-selection mechanism" that would make sure that only the poorest people were employed. However, this policy did not take into consideration the differences in economic development and unemployment levels across the country.

The communities involved had insufficient technical capacity and there was little technical support and training. Technical assistance was often missing at the planning stage, which led to inappropriate project choices. Issues like affordability and sustainability were sometimes neglected. Important aspects – such as

maintenance plans – were omitted, despite the fact that they were required by the project syntax selection criteria. Women, making up the largest proportion of the rural poor and the key target of the CBPWP, were not involved in the planning stages of projects and were usually involved only during implementation.

3.3.2 SUMMARY OF SHORTCOMINGS

In summary, the following shortcomings were noted:

- Despite the fact that CBPWP was a pilot programme, there was no effective monitoring and evaluation programme that led to a realignment of the National Public Works Programme based on the lessons learnt.
- It is clear that the National Department of Public Works did not fully take into consideration some of the lessons learnt from the other employment creation and infrastructure provision experiences.
- Important aspects were neglected, such as involvement of women at an early stage; maintenances plans; technical assistance at the planning stages, and training and technical development.
- The State budgetary processes did not allow for sufficient planning time at a provincial level.

3.3.3 CONCLUSIONS

From Mthombeni (1996) it is clear that the CBPWP failed in that:

- One (1) of the key indicators of the progress of the provincial aspect of the CBPWP up until 1996 was that only a very small proportion (14 %) of the allocated budget was spent.
- There was a lack of appropriate labour standards and regulations and no suitable wage policy for community-based projects aimed at the poorest of the poor.
- Since delivery was a key focus area, CBPWP did not place sufficient importance on a preparation and learning period for South African public institutions.

3.4 THE EXPANDED PUBLIC WORKS PROGRAMME PHASE 1 (APRIL 2004 TO MARCH 2009)

3.4.1 BACKGROUND AND BRIEF ABOUT THE PROGRAMME

On Friday, 26 August 2011, McCutcheon presented a paper prepared by McCutcheon and Taylor Parkins (2011) entitled "The Expanded Public Works Programme: policy, rhetoric, reality and opportunities foregone during the expenditure of over R40 billion on infrastructure." The researcher was part of the audience.

According to McCutcheon and Taylor Parkins (2011:1-2) salient points from the presentation are:

- South Africa has high levels of unemployment and poverty. The problems of unemployment (approximately 40 % unemployed according to the "broad" definition and close to 25 % using the "narrow" definition) and poverty alleviation are of national strategic importance.
- The Expanded Public Works Programme initiated in 2004 is one of Government's strategic components for generating employment and alleviating poverty.
- The goal of the Expanded Public Works Programme was to alleviate unemployment for least one (1) million people between 2004 and 2009. This goal was to be achieved by generating work opportunities in four (4) sectors of the economy: Infrastructure, Environment, Social and Economic.
- Labour-intensive methods were to be used in the provision of public goods and services. The budget for the infrastructure component was ZAR15 billion.
- The first five (5) years of the EPWP started in April 2004 and ended in March 2009. At the start of the Programme, the EPWP Public Sector Budget totalled ZAR21 billion; ZAR15 billion for infrastructure and the balance for the Environmental and Social Sector (the budget for the Economic Sector had not yet been determined).

- In May 2008 the Minister of Public Works announced that the goal of creating temporary work opportunities for a minimum of one (1) million people had been achieved a year ahead of schedule.
- It was intended that the findings of the study should guide approaches and strategies across all spheres of government in order to inform policy reviews of the programme. At the same time focus group discussions were held with communities in which the EPWP had been implemented and assets created.
- The paper goes beyond the conclusions reached in the studies. In particular it focuses on one (1) sector: *Infrastructure*. The paper begins with a brief outline of the objective of the EPWP and proceeds to outline the conditions which were originally set, particularly for implementation in the Infrastructure Sector, which accounted for 84 % of national expenditure and provided the greatest opportunity for the generation of a significant increase in employment per unit of expenditure.
- McCutcheon and Taylor Parkins (2011:7) note that the EPWP has generated a considerable amount of data, about 20 quarterly reports that contain over 3 949 pages of information. However, these reports say nothing about the amount and value of physical assets produced.
- From about halfway through the EPWP increasing attention was paid to one (1) item: the number of temporary work opportunities. To a lesser extent the amount of training was mentioned (McCutcheon and Taylor Parkins 2011:8).
- McCutcheon and Taylor Parkins (2011:8) opine that it is extremely disturbing that no attempt has been made to obtain the total amount of the different types of assets produced during the expenditure of >ZAR40 billion; especially given the amount of time and effort focused on the recording of details relating to the number of work opportunities generated. In itself this indicates that the intention of the EPWP regarding infrastructure was *relief* rather than *development*.

3.4.2 SHORTCOMINGS WITH RESPECT TO THE EXPANDED PUBLIC WORKS PROGRAMME PHASE 1

From McCutcheon and Taylor Parkins' (2011) paper, the shortcomings of Phase 1 of the EPWP are summarised below:

Scope of work		
Total infrastructure	Planned: (In the Infrastructure Sector 37 000 km of road, 31 000 km of pipelines, 1 500 km of stormwater drains, and 150 km of sidewalks were to be constructed) over five (5) years	Achieved: Not mentioned in the quarterly reports
Gravelled roads	Planned: Not clear	Achieved: Not mentioned in the quarterly reports
Employment created		
Number employed at peak	Planned: 1 000 000 casual labourers	Achieved: 1 069 819 of which 750 000 were to be casual labourers in infrastructure projects
Years of employment created		
Casual labourers	Planned: The goal of the EPWP was: to alleviate unemployment for a minimum of 1 million people in South Africa: at least 40 % women, 30 % youth and 2 % disabled	Achieved: Employment created not clearly categorised in terms of the goal in the quarterly reports
Training		
Labourers trained	Planned: (It was planned that 2 % of the programme budget must be allocated for training) from 2004 to 2009	Achieved: not mentioned in the quarterly reports.
Breakdown of labourers trained	Planned: Training will form part of the programme.	Achieved: Not mentioned in the quarterly reports

Training facilities	Planned: It was planned that a Training College on labour-intensive construction methods would be built	Achieved: Not in place (as at February 2012)
Financial		
Overall expenditure	Planned: ZAR15 billion (in 2004) for infrastructure	Achieved: ZAR42 billion (in 2009), amounting to 280 % of the 2004 planned expenditure
Wages	ZAR4.5 billion or 10.8 % of expenditure EPWP labour intensity decreased from 27.2 % in 2004 to 9.4 % in 2009, averaging 10.8 % over five (5) years	
Quality of workmanship	In December 2008 McIntosh Xaba and Associates were appointed by the Ministry of Public Works to carry out a meta-analysis of over 100 documents relating to the national EPWP since its inception in April 2004. McCutcheon and Taylor Parkins were members of the team that performed the studies. From this study the number of assets constructed over five (5) years were not part of the report as the focus was on the number of jobs created.	

McCutcheon and Taylor Parkins (2011:5) assert that in 2004 the Division of Revenue Act, Act No. 5 of 2004 (RSA 2004) made it **mandatory** to use labour-intensive methods for specific categories of infrastructure funded through the formal channels through which public infrastructure is funded: the Provincial Infrastructure Grants and the Municipal Infrastructure Grants.

Funding allocated for the Expanded Public Works Programme formed part of normal government expenditure and, therefore, had to follow normal procedures as specified by National Treasury under the Division of Revenue Act, Act No. 5 of 2004 (RSA 2004). These procedures included an annual audit. However, the National Treasury failed to undertake monitoring and penalise those Implementing Agents who did not comply, thus contributing towards the failure of Phase 1 of the EPWP.

Project costs were badly estimated. Indeed, in some cases, the actual costs amounted to twice or sometimes even quadruple the amount of the budget, indicating failure by implementing agents to monitor and contain project expenditure.

The Consolidated Overview – a paper by McCutcheon and Taylor Parkins (2011:6) – stated that "a National Training College for labour-intensive construction would be established." However, as at February 2012, the EPWP is in its 8th year of implementation but this college has not yet been established. When compared with the Kenya and Botswana programmes where Training Centres were established and training of supervisors, labourers and engineers took place and was successful, it indicates South Africa has failed to replicate them.

The specific categories for which it was mandatory for public bodies to use labour-intensive construction methods were: low-volume roads, stormwater drainage, sidewalks and trenches. However, the fact that little labour-intensive construction has taken place in South Africa's seven (7) predominantly rural provinces, where low-volume roads were possible to build, has contributed towards the failure.

Additional conditions were enumerated in the Guidelines. McCutcheon and Taylor Parkins (2011:5-6) note that these included:

- Consultants responsible for labour-intensive projects must have completed accredited training; the consultants who design infrastructure and prepare contracts should have accredited training – specific to the person and not to the firm. The intention was that when it came to designing projects the consultants would be equipped to optimise the use of labour.
- The EPWP guidelines contained "copy and paste" clauses for integration into standard contract documentation.
- Standard clauses would be included in the contracts, which would compel/ensure the use of labour-intensive methods.
- In particular, the contract would identify those items which could be constructed labour intensively and would compel their subsequent use by stating that if labour-intensive methods were not used for the specified items, the contractor would not be paid.
- Company owners, managers and supervisors of labour-intensive sites would also have to have accredited training. The contractors would receive accredited training in the following ways: the contractor would be trained to run a company; each contractor would have two (2) site supervisors who would be fully conversant with the organisation of teams of labour-intensive workers.

Implementation would be audited to see whether the specific categories of work had been constructed labour intensively. Site operations would be audited, as would provincial and municipal expenditure to see whether the institution had complied with EPWP regulations.

Furthermore, future allocations of funding were to be dependent upon the extent to which an authority had complied with these conditions. For example, if the institution had not constructed the specific types of infrastructure labour intensively, then they would not be given funding in future. Treasury took on the role of monitoring the work in terms of compliance with the legislated "conditionalities". This allowed for public accountability, again in contrast with previous programmes that had attempted to promote the use of labour-intensive methods.

It was also stated that, in the Infrastructure Sector, because labour-intensive methods would be used, the 750 000 work opportunities would be ***in addition to*** the opportunities that would have been provided through conventional machine-intensive construction. Additionally, the expenditure on infrastructure would be without detriment to the fiscus. (By contrast, expenditure on the social component of the EPWP required additional funding.)

The above elements provide the legislative and regulatory framework required for labour-intensive construction.

The factors mentioned above, combined with the objectives, comprise part of the frame of reference to evaluate the results of the EPWP.

3.4.3 MAJOR CONCLUSIONS FROM NATIONAL STUDIES ON THE EPWP

McCutcheon and Taylor Parkins (2011:7) reached a number of conclusions from a review of over 100 documents and categorised these conclusions into three (3) levels:

- Policy and Programme
- Issues requiring attention above the level of Programme Management
- Programme and Project management.

McCutcheon and Taylor Parkins (2011:7) mention four (4) related to Policy and Programme:

- The direct and indirect beneficiaries of the EPWP clearly (and desperately) welcomed the short-term work opportunities, and those that had worked on the EPWP were eager to get further work opportunities. They wanted more, much more.
- In relation to infrastructure, the EPWP is currently not a development programme but rather an ad hoc collection of existing and new projects.

- There was little compliance with the requirements as set out in the Division of Revenue Act No. 5 of 2004 (RSA 2004). These authors note there has been little or no enforcement to date (2011) with respect to labour intensity, type of project or component of project, related contractual documentation and training.
- Another major conclusion, which resulted in part from the lack of adherence to the Division of Revenue Act No. 5 of 2004 (RSA 2004) requirements, is that insufficient work opportunities have been generated given the amount of expenditure. In relation to the Infrastructure Sector for instance, just over 1 million work opportunities were generated at a cost ZAR42 billion, instead of a projected 750 000 for the ZAR15 billion budgeted in 2004.

According McCutcheon and Taylor Parkins (2011:7) the first conclusion is of critical importance:

> "Beneficiaries wanted more work opportunities– because so many decision makers and theorists with comfortable, well-paid jobs, state with confidence that, in South Africa, the poor are not prepared to do this type of work or, if they do, it will be done badly."

McCutcheon and Taylor Parkins (2011:8) briefly record and comment upon the main findings with respect to four (4) sets of data namely:

- EPWP budget versus actual expenditure by sector
- EPWP budget versus actual expenditure by province
- Labour intensity in the EPWP
- Labour intensity versus average project cost.

3.4.3.1 EPWP BUDGET VERSUS ACTUAL EXPENDITURE BY SECTOR

McCutcheon and Taylor Parkins (2011:8) note:

> The 2004 budget for the whole EPWP was ZAR21 billion; by 2009 almost ZAR50 billion had been spent. In itself this indicates a difference between the South African economy and most of the countries in sub-Saharan Africa: the additional expenditure was generated internally without reliance upon donor funding. Furthermore the actual 2004 to 2009 budget allocations amounted to more than four (4) times the original budget, or twice the actual expenditure. Although this indicates a severe inability to spend the allocated budget, it again indicates the scale of internal resources available to South Africa.

> The Infrastructure Sector had by far the greatest share, R42 billion or 84 % of total expenditure between 2004 and 2009. Actual expenditure on infrastructure amounted to 280 % of the 2004 budget estimate of ZAR15 billion.
>
> Comparison between allocated budget and actual expenditure shows that for the period 2004 to 2009 the trend was for the EPWP to spend a lower proportion of the allocation. The Economic Sector was the worst affected of the four (4) sectors. This is more than interesting, given the amount of attention and emphasis placed upon the role of small, medium and micro-entrepreneurial development in general and the EPWP in particular.

When comparing South Africa with other developing countries implementing labour-intensive construction programmes, a major concern is the budget overrun of 280 % that was committed on the infrastructure sector of the EPWP first phase. This was a sector with great potential, where more job opportunities should have been created but this was not the case. Because South Africa could afford to fund a programme of this magnitude without external funding this worked to the country's disadvantage as external funds would probably have come with certain conditions which would have had to be adhered to and monitored.

3.4.3.2 EPWP BUDGET VERSUS ACTUAL EXPENDITURE BY PROVINCE

McCutcheon and Taylor Parkins (2011:9) state:

> Gauteng Province and the Eastern Cape accounted for nearly half of the actual expenditure, while the remaining seven (7) provinces shared the other half. Five (5) provinces (namely, Free State, Limpopo, Northwest, Mpumalanga and the Northern Cape) combined made up less than one quarter of total expenditure. All five (5) of these provinces have significant rural populations, parts of which have been termed "deep rural". With the notable exception of the extremely poor Eastern Cape, the above distribution of funding shows insufficient focus on the rural areas within the EPWP, as does the fact that over 25 % of expenditure took place in Gauteng Province, which is the most urbanised province in South Africa.

These authors note (p9) that in 2008 Mitchell also concluded that "there was a lack of emphasis upon the rural" which was a severe shortcoming in programme design.

The EPWP's goal of generating work opportunities in the infrastructure sector stated clearly that it would be spent on four (4) categories of construction, of which low-cost, low-volume roads was one of them and this should have taken place in the five

(5) provinces which are predominantly rural as these roads are mostly found in rural areas. Instead, however, about 25 % was spent in the most urbanised province in South Africa, Gauteng, which indicates failure to achieve the programme's goals.

3.4.3.3 LABOUR INTENSITY IN THE EPWP

McCutcheon and Taylor Parkins (2011:9) observe:

> There was a steady decline in labour intensity from 26 % at the start of 2004 to nearly 11.3 % at the end of the fourth quarter of the 2008/2009 financial year. Even the Social Sector fell from 85 % to 43 %.

When considering the decline in the infrastructure sector with regard to employment generation, while the EPWP is still claiming to be labour-intensive, South Africans should be worried about the next phase of this programme: the major reasons for its failure are neglecting basics (such as training supervisors, allocating time towards development, research and the training stage (pilot projects)), which played a major role in the achievements of other developing countries' programmes.

3.4.3.4 LABOUR INTENSITY VERSUS AVERAGE PROJECT COST

McCutcheon and Taylor Parkins (2011:9) state:

> The average project cost was derived from the division of the actual expenditure by the total number of projects. Labour intensity dropped significantly over time as the value of the projects increased. As project values doubled, labour intensity decreased by two-thirds. Fast tracking the nominal incorporation of large and more sophisticated projects into the programme, thus increasing expenditure and numbers, intensified the "business as usual" attitude.

One of the factors to measure the success of any project is project expenditure. Therefore, if projects were stipulated to be implemented labour-intensively and the project costs doubled, then even the amount of money that goes to labour should also double but, in Phase 1 of the EPWP, this was not the case, which indicates a shortcoming.

3.4.4 INFRASTRUCTURE AND LABOUR INTENSITY

McCutcheon and Taylor Parkins (2011:9-10) concentrated upon the Infrastructure Sector not only because it is the largest but, more importantly, it is the main sector in which it was originally planned that a significant increase in productive employment would be generated per unit of expenditure.

> In the Consolidated Programme Overview of June 2004 it had been estimated that ZAR45 billion would be spent over five (5) years in the formally planned provision and municipal infrastructure throughout South Africa (EPWP, 2004).
>
> However, it was estimated that ZAR15 billion of this ZAR45 billion would be spent on four (4) categories of construction:
>
> - Low-cost, low-volume roads
> - Stormwater drainage
> - Trenches and
> - Pedestrian and cycle paths.
>
> These four (4) categories of infrastructure are eminently amenable to being constructed using highly labour-intensive methods. Using techniques and procedures that have been well tried and tested elsewhere in sub-Saharan Africa and in South Africa, it could reasonably be expected that at least 40 % of direct construction costs would be earned by the labourers.

Furthermore, as McCutcheon (1992) and McCutcheon and Taylor Parkins (2011:10) note:

> Insufficient attention has been paid to the rural areas. Their interpretation of this is that less money was spent in those areas on the types of infrastructure which are particularly amenable to being constructed using labour-intensive methods. Little attention has been paid to projects where successful models from elsewhere in sub-Saharan Africa could be replicated. For example, the Kenya Rural Access Road Programme and its immediate successor, the Minor Roads Programme, constructed and maintained over 12 000 km of low-cost, low-volume gravel road. At its peak the programme employed, at the same time, over 10 000 people on construction and 5 000 on maintenance. Similar programmes existed in Botswana, Lesotho and Malaŵi (Quainoo 2010 and Quainoo and McCutcheon 2009).

Furthermore, McCutcheon and Taylor Parkins (2011:11) note:

> Gauteng Province accounted for 25 % of expenditure on infrastructure...Very little of the expenditure on infrastructure in Gauteng was devoted to the four (4) categories that were supposed to be the main foci of the EPWP Infrastructure Sector. The majority of expenditure in Gauteng was on a much higher standard of road. That standard of road could have been constructed using labour-

intensive methods. Prior to the EPWP over 400 km of the standard of road (residential and urban bus routes) had been constructed in various parts of South Africa [citing Hattingh et al 2007 and McCutcheon and Taylor Parkins, 2003]. But the effective use of labour-intensive methods necessitates a re-engineering of the whole design, contract and construction process [citing McCutcheon et al 2007]. This has not taken place. The extent of the re-engineering required for low-cost roads is extensive but not to the extent required for higher standards of roads.

McCutcheon and Taylor Parkins (2011:11) discuss several anomalies that occurred, such as:

- Projects were simply labelled "labour intensive", but conventional methods were used.
- Consultants did not re-engineer the projects: new designs were not prepared; the greater use of productive labour was not the "design driver"; appropriate specifications were not included in supposedly labour-intensive contracts.
- Some of the contracts included clauses that indicated that labour-intensive methods would be used, but the clauses were ignored.
- Contracts were awarded to small contractors who were not able to use labour-intensive methods.
- Not only were contracts implemented using conventional capital-intensive methods: in some cases extra people were hired to sit under a tree alongside the site where the equipment was working in order to raise the number of employees. Often even this tokenism was not considered necessary.
- The essentially machine-intensive, conventional methods resulted in the cost per kilometre varying from two (2) to four (4) times the cost which would have been achieved during the same period using machine-intensive methods had the projects been implemented outside the umbrella of the EPWP.
- Given that these contracts generally use the same amount of labour as conventional projects, the extremely high total costs meant that the proportion of expenditure going to labour was even less than under conventional construction/normal conditions.
- Contractual clauses were not enforced.

Part of the reason for this sorry state of affairs is that there is very little in-house capacity or competence within most public bodies to assess technical matters. This is outsourced to consultants. Unless the consultants have been thoroughly trained, they cannot design labour-intensive projects, or prepare appropriate contract documentation, or assess the effectiveness of implementation.

Added to these factors is the prevailing prejudice in the civil construction industry against labour-intensive construction.

Infrastructure is one sector that has great potential to generate more job opportunities, when considering Table 2.1 (a comparison of successful completed programmes in Africa). Table 2.1 shows that the money that went to labour as wages ranges between 38 % and 65 %. In the case of South Africa's EPWP, looking at the worst case scenario (38 %) the amount of money that could have gone to labour in the form of wages on Phase 1 should have been ZAR15.96 billion, ZAR11.46 billion more than what was actually achieved. This aspect alone indicates the magnitude of the failure of Phase 1 of the EPWP.

3.4.5 CRITIQUING THE METHODOLOGY

Phase 2 of the EPWP started in April 2009 and was supposed to come to an end in 2014. As at February 2012 the programme has not yielded the expected (planned) results. Of major concern is the picture painted to the public at large, even as recently as October 2011 (EPWP 2011:9), in which it is claimed that the programme has been successful thus far, while it has not.

- Although the EPWP had no pilot programme, the fact that it is now on Phase 2 presents an opportunity for improvement but, since experts have not been consulted, the degree of failure is still high.
- In Phase 1 of the EPWP, there was no effective monitoring and evaluation. The same contention holds for Phase 2 which is currently in progress and, if no serious intervention is made, the whole programme will fail.
- It is clear that Phase 1 of the EPWP did not fully take into consideration some of the lessons learnt from the other employment creation and infrastructure provision experiences elsewhere in sub-Saharan Africa.
- During Phase 1 of the EPWP several important aspects were neglected (such as creating employment in rural areas; technical assistance at the planning stages, and training and technical development).
- More emphasis was put on the number of jobs created but nothing was said about the infrastructure constructed and its quality.
- Non-compliance with the Division of Revenue Act No. 5 of 2004 (RSA 2004) to enforce labour-intensive projects indicates failure from all

spheres of Government: Municipal, Provincial and National Departments and Treasury to fulfil their roles.

3.5 CONCLUSIONS

From the paper by McCutcheon and Taylor Parkins (2011) it is clear that Phase 1 of the EPWP has failed in that:

- Its objective was to create temporary work opportunities and income for at least 1 million unemployed people. Even though 1 069 819 jobs were achieved (which was 7 % greater than the target), it was achieved at nearly double the anticipated cost.
- The percentage of project cost that went to labour as wages was below 11 %, and this indicates failure when compared with other successful programmes, where more than 50 % was achieved.
- The fact that there was a decline in labour intensity from 26 % at the start of 2004 to nearly 11.3 % at the end of the fourth quarter of the 2008/09 financial year indicates failure of this programme to achieve its objectives.
- Another objective was to provide needed public goods and services, labour intensively to required standards. The fact that there is no record of assets constructed in the quarterly reports indicates a major failure.
- An objective was to increase the potential of participants to earn a future income by providing work experience, training and information related to local work opportunities, further education and training, and small-, medium- and micro-enterprise (SMME) development but, in the view of McCutcheon and Taylor Parkins (2011:13), little was achieved in this regard.
- It was also stated that there was going to be a National Training Centre for training of foremen, supervisors, contractors and engineers on labour-intensive construction (EPWP 2004:26), which, to date, (February 2012) has still not been established. This also indicates the programme's failure, when compared with the Kenya and Botswana programmes, where their successes were a direct result of the Training Centres they have established.

- Despite there being long-term political support and Government's commitment to the programme, the fact that there was a lack of in-house (municipal and provincial departments) capacity and/or skills on labour-intensive projects where the implementation was taking place and failure to consult experts with extensive experience on labour-intensive projects contributed to the programme's failure.
- The fact that in the Infrastructure Sector it was anticipated that the average duration of employment would be 80 days, whereas an average of about 66 days was achieved over the full five (5) year period, also indicates failure of Phase 1 of the EPWP.
- McCutcheon and Taylor Parkins (2011:13) opine "wages in the infrastructure components of the EPWP amounted to only ZAR4.5 billion or 10.8 % of expenditure." However, had proper labour-intensive methods been used for specific categories of infrastructure, a labour intensity of at least 40 % (p13) of direct construction costs would have been achieved. "This would have amounted to some R16.7 billion. Thus, an additional amount of >R12 billion should have reached the poor" (p13)... but this was not the case with Phase 1 of the EPWP.
- The fact that during the EPWP labour intensity decreased from 27.2 % in 2004 to 9.4 % in 2009, averaging 10.8 % over five (5) years, indicates how badly Phase 1 has failed as compared to the other successful programmes discussed in Chapter 2 of this research report.

In conclusion, Phase 1 of the EPWP has failed and currently (February 2012) Phase 2 of the EPWP is more than 50 % into its implementation but the basics are still not right and it is almost certain that it will also fail unless drastic intervention takes place. McCutcheon and Taylor Parkins (2011:14) opine

> if a proper programme is not established, the second phase [Phase 2] of the EPWP will be just as inefficient in generating a significant increase in effective work opportunities amongst the poor, particularly the rural poor, during the provision of public infrastructure.

Thorough research into Phase 1 of the EPWP is required in order to establish the number of assets created and the quality of these assets.

In summary, this chapter focused on experiences from labour-intensive programmes implemented in South Africa. Even though there were few successes, there were experiences and lessons that may be taken from the programmes studied with regard to employment creation.

The Strategic Oil Fund and CBPWP claimed that they were based on the principles of labour-intensive projects. Equally, they claimed to have incorporated lessons from international experiences. However, during implementation, there was little evidence of either of these claims. Firstly, a few of the projects were carried out labour intensively. Secondly, the so-called programmes did not follow the programme format adopted in Kenya and Botswana: planning a series of related projects, commencing with pilot projects to adopt labour-intensive methods through local authorities, training at first on a small scale then expanding gradually to provide human resources to implement the programme, all combined within a small framework guided by the principle of programme management.

Table 3.1 compares the three (3) programmes discussed in this chapter, indicating their shortcomings with regard to the amount of money that went to labour and employment created. By comparing this table with Table 2.1 on the regional African experiences it clearly indicates that South Africa has failed to replicate the Kenya and Botswana programmes. When looking at South Africa's programmes they claim to be labour intensive, yet – in some of the programmes – the amount of expenditure paid to labourers as wages cannot be accounted for or is not even mentioned. The same situation holds for the number of assets and the quality of the end product created.

The major failing in the projects implemented in South Africa has been that the research and development phase or pilot project phase and training were neglected. Little was done with regard to small contractor development, for which McCutcheon and Taylor Parkins (2011:13) note:

> considerably less start-up and operation capital is required and it was one of the prime considerations for the promotion of labour-intensive small contractors in the East and West Africa.

The negative and cautionary lessons learned from this chapter form a very good base for Chapter 4 which focuses on the Modimolle Local Municipality labour-intensive

pilot project. From the shortcomings identified in Chapter 3, Modimolle's aims and objectives were to benchmark on the regional experiences and do the opposite of the South African experiences outlined in this chapter.

The next chapter, Chapter 4, introduces Modimolle Local Municipality and their labour-intensive pilot project, which formed a base for the Modimolle Council to resolve to implement all their infrastructure projects using labour-intensive methods of construction as far as practicable. The problems encountered during the pilot project, together with the successes, are documented in Chapter 4.

Table 3.1: South African perspective: comparison of three major programmes implemented in South Africa

Programme name	Was there a pilot project (yes/no)	Pilot project duration (years)	Programme planned duration (years)	Programme achieved duration (years)	Number of casual labourers employed	Quality of end product	Money that went to labour as wages (ZAR)	Money that went to labour as wages (%)
Strategic Oil Fund*	No	0	3	4	Not clear	poor	20 million*[+]	8 %
Community-Based Public Works Programme**	No	0	2	After 2 years only 14 % of the budget was spent	Not clear	poor	Not clear	Not clear
Expanded Public Works Programme: Phase 1***	No	0	5	5	1 069 819	Not clear as the assets constructed do not form part of the quarterly reports	4.5 billion	10.8 %

Source: *Greyling (1994), *[+]Greyling (1994:223), **Mthombeni (1996), ***McCutcheon and Taylor Parkins (2011)

CHAPTER 4:
MODIMOLLE LOCAL MUNICIPALITY AND THE PILOT PROJECT

4.1 BACKGROUND

Post the 1994 general election, South Africa was demarcated into nine (9) provinces (Figure 4.1). The municipalities in these provinces were divided into three (3) categories (GCIS 2009):

- **Category A** are the metropolitan municipalities and, in June 2007 (when this research was conducted), South Africa had 6 (six) metropolitan municipalities, of which three (3) were in Gauteng Province, one (1) in KwaZulu-Natal, one (1) in the Eastern Cape and one (1) in the Western Cape. Limpopo, Free State Mpumalanga, North West and Northern Cape had no metropolitan (Category A) municipalities.
- **Category B** are the local municipalities. In June 2007 there were 227 local municipalities, of which 25 local municipalities were in Limpopo Province.
- **Category C** are the district municipalities, and as at June 2007, there were 45 district municipalities in South Africa. Limpopo had five (5) district municipalities.

Limpopo Province (Figure 4.1) is predominantly rural, with vast areas of land being utilised for farming. In September 2001 and September 2002, Limpopo Province was the poorest province in South Africa with a published unemployment rate of 33.1 % and 32.6 %, respectively (SSA 2009: Labour Force Survey Historical Revision: September Series, 2000 to 2007). All 25 local municipalities in Limpopo Province also battled with unemployment and backlog problems with regard basic services

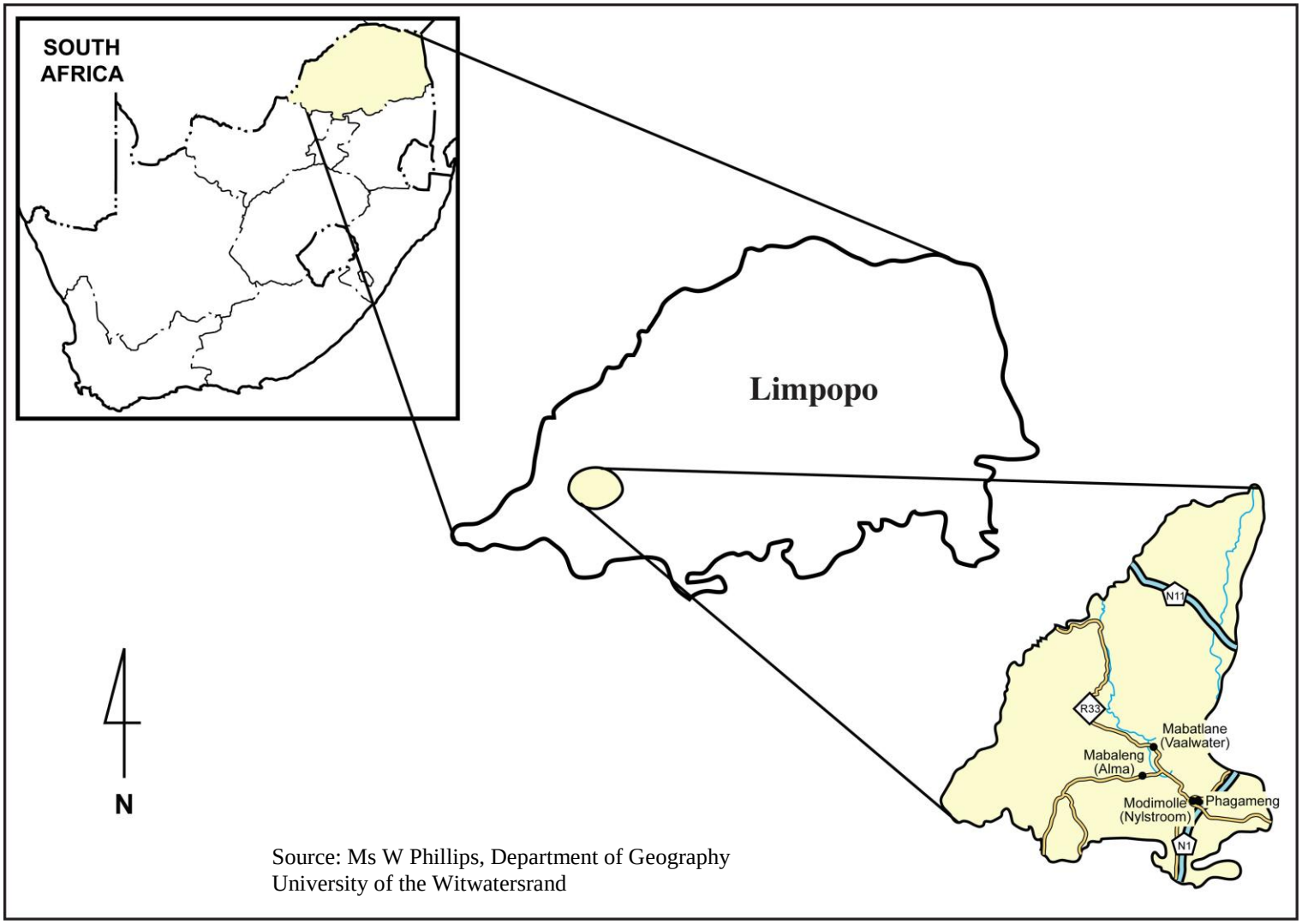


Figure 4.1: Map of South Africa, showing Limpopo Province and Modimolle Local Municipality (the study area) (not to scale)

such as water, sanitation, electricity, refuse removal, road and storm water construction, and maintenance. In this respect, Modimolle Local Municipality was no different, nor was it better off when coming to issues of unemployment: the level of unemployment was estimated to be at 50 % in 2002 (Modimolle 2003). Apart from the unemployment problem, Modimolle also had basic service backlog problems.

4.1.1 INTRODUCTION TO MODIMOLLE LOCAL MUNICIPALITY

Modimolle Local Municipality is a Category B municipality situated within the Waterberg District Municipality. It is 6 228 km^2 in size with a total population of 52 599 (Modimolle 2009). The Municipality is a water service authority and provides water and electricity to its community. Modimolle is situated ~130 km to the north of Pretoria along the N1 road and ~155 km to the south-west of Polokwane (the provincial capital of Limpopo Province).

Modimolle has hot summers and mild winters. Modimolle is renowned for its export-quality grapes and other fruit (such as melons and peaches). Modimolle is the administrative capital of the Waterberg region, which means that all government district offices are situated in Modimolle town including the Waterberg District Municipality.

The Modimolle Local Municipality is divided into the following areas:

- Modimolle town and Phagameng
- Mabatlane town and Leseding
- Mabaleng, while
- the remainder of the area is predominantly a farming area.

The eviction of farm dwellers by farmers around Modimolle following the promulgation of the Extension of Security Tenure Act, Act No. 62 of 1997 (RSA 1997) did not do justice to the Modimolle Local Municipality as many farm workers were fired from their jobs and had to leave the farms on which they resided, which created more unemployment and further increased the infrastructure backlog (with regard to the need for more serviced stands and housing). In 2007 the illiteracy level in Modimolle was high – 39 % of the population did not have Grade 12 (previously known as Standard 10) (Modimolle 2009).

Another Act promulgated by the Government of National Unity was the Local Government: Municipal Systems Act, Act No. 32 of 2000 (RSA 2000). This Act required all municipalities in South Africa to develop an Integrated Development Plan (IDP). The IDP is a five (5) year strategic plan for a municipality and is the process through which municipalities prepare a strategic development plan through an intense consultation process with its stakeholders. It informs all planning, budgeting, management and decision-making processes of a municipality.

The Act required that this five (5) year plan be reviewed annually. Other than the IDP, Modimolle Local Municipality also has the following Sector Plans which inform the IDP: the Water Service Development Plan, the Roads and Stormwater Master Plan and the Electricity Master Plan.

In addition to these Sector Plans, Modimolle Local Municipality, through its IDP processes which necessitate the involvement of all stakeholders, has managed to:

- Identify most needs and challenges, and key development priorities.
- Formulate a clear vision and mission.
- Align resources with the development priorities.

During the 2002/2003 municipal financial year, Modimolle Local Municipality identified unemployment as one of their major concerns and a problem to be given high priority. In their 2002/2003 IDP they also mentioned labour-intensive methods of construction as a possible solution to their problem of high unemployment.

This solution of labour-intensive methods of construction was well documented in the Modimolle Local Municipality's previous IDPs before the 2002/2003 financial year. In November 2002 the Council of Modimolle took a resolution to appoint the researcher as their Technical Director to head their Department of Technical Services.

This department consisted of the following divisions or sections:

- Water and Sewer Section
- Town Planning and Housing Section
- Electricity and Mechanical Section, and
- Public Works section (Roads and Stormwater Section).

In 2007 the Department of Technical Services was the biggest department in the Municipality. This was the service delivery department of the Municipality and, for the Municipality to realise their mission and vision, the initiative to start implementing projects labour intensively was supposed to originate from this department.

4.1.2 EXISTING INFRASTRUCTURE

4.1.2.1 ROADS

The existing road infrastructure and backlog is given in Table 4.1.

Table 4.1: Road infrastructure and backlog as at May 2009

Area description	Total length of all roads (m)	Length of surfaced roads (m)	Backlog %
Modimolle town	74 014	66 414	10.26
Phagameng	65 478	8 208	87.46
Mabatlane	43 793	8 740	80.11
Mabaleng	3 095	0	100
Total	**186 380**	**83 362**	**55.29**
Source: Modimolle (2009:17)			

The existing local municipal road network comprises a total of 186.4 km of roads of which 83.4 km are surfaced roads (that is, only 44.7 % of the total local road network is surfaced) and 103.0 km are gravel roads (representing 55.3 % of the total local road network). Of the surfaced road network, 85 % of the roads are in a relatively good to fair condition (Modimolle 2009:17).

The fact that Modimolle has a Roads and Stormwater Master Plan made it easy for their Public Works Section to maintain the existing road infrastructure.

4.1.2.2 WATER

Water for the townships surrounding Modimolle is obtained from the following sources (Modimolle 2009:21):

- Modimolle town/Phagameng has a storage capacity of 24 ML, which is sufficient to cater for the population in this area, and obtains potable water from:
  a. Donkerpoort water purification plant (the water is purified from Donkerpoort Dam situated within the Municipality);
  b. Boreholes within the Municipality; and,
  c. From Klipdrift purification plant near Hammanskraal.
- Mabatlane town/Leseding has a storage capacity of only 3 ML, and obtains their water supply from boreholes (their only source of water supply).
- Mabaleng has a storage capacity of only 3 ML and obtains their water supply from boreholes (their only source of water supply).

Table 4.2: Water infrastructure and backlog as at May 2009

Area description	Number of households with water connection on stands	Number of households without water connection on stands	Backlog %
Modimolle town	3 227	180	5.58
Phagameng	6 195	2 115	34.14
Mabatlane	3 998	720	18.01
Mabaleng	297	297	100
Total	**13 717**	**3 312**	**24.14**
Source: Modimolle (2009:21)			

The bulk water infrastructure in Modimolle town and internal reticulation is predominantly asbestos-cement pipes which were laid >50 years ago and ageing is creating problems in this network as there are many burst pipes encountered on a monthly basis.

4.1.2.3 SANITATION

The sanitation situation for the townships within Modimolle Local Municipality is (Modimolle 2009:22):

- Modimolle town/Phagameng is currently serviced by a waste-water purification plant which has a capacity of 3 ML/day, while the required capacity due to growth is 4 ML/day. The community in this area are supplied with waterborne sewerage.
- Mabatlane also has waterborne sewerage through oxidation ponds, with 720 stands having pit latrines.
- Mabaleng does not have any formal sanitation system in place. Some pit latrines did not meet the Reconstruction and Development Programme standard of service.

Table 4.3: Sewer infrastructure and backlog as at May 2009

Area description	Number of households with a sewer connection	Number of households without a sewer connection	Backlog %
Modimolle town	3 227	180	5.58
Phagameng	6 195	3 118	50.33
Mabatlane	3 998	720	18.01
Mabaleng	297	297	100
Total	**13 717**	**4 315**	**31.46**
Source: Modimolle (2009:22)			

4.1.2.4 ELECTRICITY

Modimolle Local Municipality has a licence to supply electricity to its community. The municipality purchases electricity in bulk from Eskom and distributes it through its infrastructure to the community. Council owns and maintains the entire infrastructure.

Details of the electricity infrastructure and backlog are provided in Table 4.4.

Table 4.4: Electricity infrastructure and backlog as at May 2009

Area description	Number of households with an electricity connections	Number of households without an electricity connection	Backlog %
Modimolle town	3 227	180	5.58
Phagameng	6 195	2 403	38.79
Mabatlane	3 998	520	16.77
Mabaleng	297	0	0
Total	**13 717**	**3 153**	**22.99**
Source: Modimolle (2009:22)			

For the purpose of this research report, other infrastructure (such as housing, refuse removal and social services) will not be discussed. Electricity and roads have been mentioned to emphasise the overall backlog of the municipality.

4.1.3 ROAD INFRASTRUCTURE

The backlog in Modimolle's infrastructure is detailed in the sections that follow.

4.1.3.1 INTERNAL ROADS

The current backlog on the internal roads in the municipality is that 103.1 km of 186.4 km are gravelled, which amounts 55 % which still need to be surfaced. This can be quantified in ZAR by considering the recently completed projects and Municipal Infrastructure Grant guidelines which "estimate that to complete a section of 1 km of low-cost road needs ZAR1.9 million." This means that Modimolle will require ZAR195.8 million just to address the roads backlog to date (as at February 2012). Other than the local road network, the following provincial roads have also been prioritised (Modimolle 2009:17-19).

4.1.3.2 ROADS FOR TOURISM

- R33 from Modimolle to Mabatlane to Lephalale: 120 km needs to be rehabilitated at a cost of ZAR240 million.
- R33 from Modimolle to Marble Hall: 83 km needs to be rehabilitated at a cost of ZAR166 million.

4.1.3.3 ROADS FOR AGRICULTURE

- Mokgopong to Mabaleng to Thabazimbi: 138 km requires surfacing at a cost of ZAR552 million.
- Bela-Bela to Mabaleng: 47 km requires surfacing at a cost of ZAR188 million.
- Marekele National Park to Leeupoort: 47 km requires surfacing at a cost of ZAR188 million.

4.1.4 WATER INFRASTRUCTURE

In Modimolle town/Phagameng, in 2009 the water supply backlogs in this area were:

- 150 households in Modimolle Extension 2
- 30 households in Modimolle Extension 11
- 300 households in Phagameng Extension 8 and
- 1 100 households in Phagameng Extension 10.

In 2009 in Mabatlane town/Leseding the water supply backlogs in this area were:

- 500 households in Mabatlane Extension 4 and
- 70 households for Mabatlane Extension 3.

There is also the need to find a reliable source of water – other than from boreholes – which are currently the only source of bulk water supply within this area.

In 2009 there were no water supply backlogs in Mabaleng although the water supply is from boreholes. Sufficient water was yielded from this source and the current storage capacity was also adequate.

4.1.5 SANITATION INFRASTRUCTURE

In 2009, for Modimolle town/Phagameng, the sewer backlog was: 3 298 households without proper sanitation, and at Mabaleng: 720 households were without proper sanitation at Reconstruction and Development Programme standard.

4.1.6 ELECTRICITY INFRASTRUCTURE

For this service, in 2009, other than bulk infrastructure that needs an upgrade from 20 MVA to 40 MVA, there was only a backlog for:

- Modimolle town/Phagameng: 2 583 households without an electricity connection.
- Mabatlane: 570 households without an electricity connection.

With the above-mentioned backlogs and the high level of unemployment and illiteracy, there was indeed a need for Council to come-up with innovative ideas as to how to address these challenges, and it was found that labour-intensive methods of construction could be an appropriate solution. After the use of this method was included in their previous IDP documents, the Council of Modimolle embarked on an ambitious mission to implement all their capital projects labour intensively with effect from November 2002.

4.2 THE PROCESS OF IDENTIFYING, BUDGETING FOR AND IMPLEMENTING PROJECTS

Modimolle Local Municipality through its IDP and Sector Plans such as the Water Service Development Plan, Roads and Stormwater Master Plan and Electricity Master Plan has very good documented systems in place to guide the process of implementing projects annually.

Briefly the seven (7) phases of the IDP process are:

4.2.1 ANALYSIS PHASE

The purpose of this phase is to provide the Municipal status quo and its compilation is through a desk-top study. Owing to the availability of Sector Plans in Modimolle, it was easy to provide the Municipal status quo from these plans.

4.2.2 STRATEGY DEVELOPMENT PHASE

This focuses on the development of strategies that illustrate how the municipality intends to address challenges and needs identified as a challenge at analysis stage. Labour-intensive methods might be identified as a strategy to address unemployment problems.

4.2.3 SPECIAL DEVELOPMENT FRAMEWORK PHASE

This phase guides development within a municipality. It provides a clear character or identity of a municipality and its potential for growth. It is developed within a framework which enables and directs development in an appropriate and desired manner.

4.2.4 IMPLEMENTATION PHASE

This phase ensures that all plans and programmes that are implemented within the jurisdiction of the municipality are integrated and aligned. Project development includes project costing, setting time targets, identifying beneficiaries and the source(s) of funding. All funded and non-funded projects are included in the IDP for the purpose of potential funders to assist as and when they are able to.

4.2.5 FINANCIAL PLANNING PHASE

This indicates the total municipal budget, including both the operational and capital budget. It is a three (3) year plan that indicates municipal budget, planned expenditure and planned income.

4.2.6 ORGANISATION STRUCTURE PHASE

This phase indicates municipal human resource capacity per department and factors hampering service delivery on day-to-day operation activities.

4.2.7 REVIEW PHASE

In this stage the process starts again from analysis by looking back and checking what was achieved and providing the municipal *status quo* again, and the other phases follow in the same sequence as discussed above.

If every phase is done in consultation with all stakeholders as required by the Local Government: Municipal Systems Act (RSA 2000), and also if all available Sector Plans are taken into consideration, this should guarantee a well-documented IDP and, in Modimolle, this was the case.

The Modimolle Local Municipality was one of the municipalities with the best IDP document, which enjoyed the support of almost all stakeholders. Through these processes local communities, provincial departments, NGOs, Councillors, and other important stakeholders are involved early in the selection of projects, and their prioritisation and implementation, ensuring transparency and their support throughout.

4.3 MODIMOLLE LOCAL MUNICIPALITY PILOT PROJECT (NOVEMBER 2002 TO JUNE 2003)

4.3.1 BACKGROUND AND BRIEF ABOUT THE PROJECT

Below follows the background and a brief précis of the project.

4.3.1.1 PHAGAMENG EXTENSIONS 5 AND 6 LETŠEMA PILOT PROJECT

Phagameng Extensions 5 and 6 is a township which is situated 7 km from Modimolle town. The total number of households in Phagameng Extensions 5 and 6 is 800. During the 2002/2003 IDP and municipal budget, the Council of Modimolle approved an amount of ZAR1 million to provide water to individual stands (Erfs/Erven) to this extension. By then 280 stands had a water connection in the yard, while 520 households were provided with water via stand pipes which were within a 200 m radius from their yards. The approved budget of ZAR1 million was to reticulate these 520 stands.

4.3.2 APPROVAL OF IDP AND MUNICIPAL BUDGET

The municipal financial year starts on 1 July and ends on 30 June the following year. Chapter 5 of the Local Government: Municipal Systems Act, Act No. 32 of 2000 (RSA 2000), requires all municipalities to adopt IDPs and approve budgets at least 30 days before the start of the new financial year.

In 2002 the Modimolle Local Municipality complied with this Act, and both their IDP and municipal budget were approved before the 31 May 2002. During the development of Modimolle's 2002/2003 IDP and municipal budget, unemployment was identified as one of the highest priorities to be addressed.

In their IDP, labour-intensive construction methods were adopted to implement all their capital and maintenance projects. The IDPs prior to 2002/2003 also suggested labour-intensive methods of construction as an appropriate solution to address their

infrastructure backlogs in order to reduce the high percentage of unemployment within the Modimolle Local Municipality.

In their IDP, Council also recommended the development and support of SMMEs to address unemployment, but neither the labour-intensive projects nor the SMMEs were properly measured to check if indeed they were achieved. By November 2002 the municipality was already five (5) months into the financial year and, as in the previous years, nothing had been done to implement Council's resolution to implement capital and maintenance projects using labour-intensive construction methods, so this remained a paper exercise.

4.3.3 PROCESS OF IMPLEMENTING THE FIRST-EVER, LABOUR-INTENSIVE PROJECT (PILOT PROJECT) IN MODIMOLLE

As mentioned above during November 2002 the researcher was appointed by the Council of Modimolle Local Municipality as their Technical Director. In 2002 the researcher attended a course at the University of the Witwatersrand (given by Prof. R.T McCutcheon) (McCutcheon 2002) on Employment Creation which changed his perception about labour-intensive methods of construction not being economical as compared with conventional methods of construction.

When the researcher resumed his duties in November 2002, during the first Management meeting, he suggested the implementation of this project in Phagameng Extensions 5 and 6 using labour-intensive methods of construction as a pilot project. After the Management Committee supported the suggestion, the proposal was presented to a Modimolle Local Municipality Executive Committee meeting in mid-November 2002.

The Executive Committee's support of this proposal, together with their recommendation for executing this water project in Phagameng Extensions 5 and 6 using labour-intensive methods of construction, was then tabulated at a Council meeting which was held on 29 November 2002. Council approved this pilot project and the Council resolution to implement this project further had a condition that following successful implementation of this pilot project, all other projects must follow the same methods of construction (labour-intensive).

The resolution was taken by Council that an excavation task, Table K3 of the Kenya Rural Access Road Programme (de Veen 1980,1983) would be used as a guideline to set the scope of each task on the Modimolle projects. The resolution was based on a complete task of 3.5 m^3 but it did not limit labourers regarding the number of tasks one could undertake in a day... "the sky was the limit". The principle of "no work, no pay" was also adopted by Council. The conditions of employment were adopted from Ministerial Determination No. 3: Special Public Works Programme (RSA 2002).

4.3.4 PROJECT IMPLEMENTATION PLAN PHASES

The project was implemented in three (3) phases:

4.3.4.1 PHASE 1: PLANNING

The planning details for Phase 1 were:

- The planning phase started in mid-November 2002 after the Management Committee's recommendation was adopted by the Executive Committee of Council. During this phase, which took two (2) months from mid-November 2002 to January 2003, all the necessary approvals were obtained and followed by procurement of material.
- Detailed design was completed long before the approval of the 2002/2003 municipal budget, as the 280 stands were reticulated already. During the reticulation of these 280 stands a detailed design for the entire extension was drawn up.
- Procurement of equipment and other small plant was also done at this phase. The recruitment of local labourers also took place in early January 2003 through a process which was agreed upon with the community. Anyone who was interested in being employed as a local labourer was invited to attend an open, public meeting. At this meeting, a box was used for all interested in working on the project to put their identity documents into and a minor – a child age ~6 years – was required to pick an identity document out of the box and the name of the person whose identity document was picked was read out and invited to be recruited. The process continued in this way until the required number of potential employees was reached.

- Twenty (20) casual men were appointed for excavation, while 10 women were appointed for bedding preparation and backfill duties. Two (2) men were also appointed from the community as Supervisors based on the previous experience they had acquired while working with the other contractors within the municipality and their duties were: setting tasks, checking completed tasks, booking labours working on the daily duties, supervising bedding preparation and backfilling of pipes in layers and pipe laying. Wages were kept low, with unskilled labours being paid R35 per task while supervisors were paid R50 per day. The minimum wage for Limpopo Province during November 2002 was R46.89 for unskilled labourers as per the South African Federation of Civil Engineering Contractors (SAFCEC 2003). The municipality made one (1) Technician from its Water and Sewer Section available as a Project Manager and his duties were to assist with the transportation of materials and equipment and also to monitor pipe testing, while the researcher was the Programme Manager.

4.3.4.2 PHASE 2: PRE-IMPLEMENTATION

The planning details for Phase 2 were:

- This phase took place in mid-January 2003, immediately after the appointment of local labourers. During this phase contracts were signed with all local labourers, conditions of employment were explained to them in the language that they understood. On-the-job training and orientation of local labourers took place. The on-the-job training that took place was focused on safety with regard to the trenches to be excavated and the safety of the local communities.
- During this phase it was checked to establish whether the 3.5 m^3/day was an achievable daily task. After it was found that some workers could achieve 3.5 m^3 of excavation even before lunch (while others took an entire day to complete a task), it was decided that 3.5 m^3 would be the daily task for the labourers on this site. The 3.5 m^3 daily task for 20 labourers digging the trenches was calculated at a daily production rate of 100 m of pipes to be laid and at least a 300 mm blanket layer to be completed daily.

4.3.4.3 PHASE 3: IMPLEMENTATION

The planning details for Phase 3 were:

- This phase started in the fourth week of January 2003. The following were already on site when construction started:
    - 50 % of all material purchased. The remaining 50 % had been ordered and the material suppliers were awaiting instructions as to when to deliver the balance;
    - All the personal protection equipment, and
    - Small equipment (such as shovels, picks, a Wacker and hand-held compactors).
- During the planning phase it was agreed that the minimum length of pipe the team should lay on a daily basis should be 100 m. The 100 m was based on the following assumptions: There was a team of 20 labourers on site each digging 3.5 m^3/day. This equated to 100 m minimum, with a trench width of 700 mm at a total length of 5 m by 1 m depth. The 10 remaining workers (daily rate workers), who were women, were supposed to do the following daily duties:
    - Prepare bedding.
    - Load and off-load the pipes from the municipal bakkie allocated to the site.
    - Assist the two local Supervisors to bring the pipes close to the trenches and to lay the pipes.
    - Backfill the first 300 mm and compact.

      On day two (2), the team for digging continued with the trenching, while some female workers backfilled the remain der of the trench and others delivered the pipes to site from the municipal storeroom.
    - At the planning stage it was agreed that all pipes and fittings for this pilot project should be kept at the municipal storeroom for control purposes. The municipal Storeman issued the materials but different, project-specific requisition and approval forms were used.

- On classifying the Phagameng Extensions 5 and 6 soil type as per Table A3-2 (Detailed task rates for excavation), according to de Veen (1980, 1983) the type of soil falls under "loose, not sticky soil" (with a throwing distance of 0 to 4 m). Thus the minimum of 5 m³/day, with a maximum of 6 m³/day, should have been achievable. But, during the pilot project, this rate of manual excavation was not thoroughly tried and tested and there was a profound fear of failure so the daily task was set on the low side at 3.5 m^3/day (even though some labourers could achieve it before lunchtime.

- During implementation it was found that the labourers were doing on average three (3) tasks each per day. In bench-marking this against Table A3-2 it was clear that a task of 6 m³ at a throwing distance of 4 m was achievable in these soil conditions. But, since the Programme Manager feared failure and he was relatively inexperienced on labour-intensive methods of construction (except for the theory gained at an Employment Creation course), he kept the daily task set at a low level during the pilot-testing stage irrespective of what research overseas has proved (de Veen 1980, 1983).

4.3.5 SYNOPSIS OF PROJECT MILESTONES

The project details were:

Project name	Phagameng Extensions 5 and 6 Letšema pilot project
Approved budget	ZAR1 million only VAT exclusive
Project sponsor	Modimolle Local Municipality
Client	Modimolle Local Municipality
Consultant	N/A
Contractor	Modimolle Local Municipality

4.3.6 OUTLINING AND DETAILING OF DUTIES FOR THE PILOT PROJECT

A total of 520 stands were to be reticulated, with 520 house connections and 12 500 m of pipes to be installed. The trench width was 700 mm, with a depth of 1 m across a total distance of 5 m to make a complete task (0.7 m x 1 m x 5 m) = 3.5 m^3. Thus, the number of tasks to complete the project = 12 500/5/20 = 125 tasks. It was assumed that each labourer would complete one (1) task daily. This meant that in one (1) day at least 100 m of pipe would be laid. To complete 12 500 m, assuming no work is done over weekends and also that no labourer is able to complete more than one (1) task in a day, would take the team 125 days.

The implementation of the pilot project started on 27 January 2003. The project was required to be completed within 22 weeks, including Easter, weekends and public holidays. Thus, in effect, there were only 111 days to complete a project that required 125 days, without considering any other delays that might be encountered as a result of rain (implementation started during the raining season). So the project team had to provide initiatives as to how to overcome these problems. The options that were available were:

- To encourage the team to do at least two (2) tasks per day.
- To allow the team to work for two (2) fortnights and assess the situation and, if necessary, increase the number of labourers in the team.
- To encourage the team to work some weekends to make up the 14-day periods and also any delays due to unforeseen conditions or inclement weather.

4.3.7 TEAM OUTPUT DURING IMPLEMENTATION

On average each labourer was able to complete three (3) tasks per day, which meant 300 m of pipe trench could be excavated in one (1) day. At this rate of production, bedding preparation due to the soil type was easy. The problem became backfilling and compaction, which necessitated that the team needed to be increased by an additional 10 women, which brought the total number of people in the team to 42 (namely, two (2) Supervisors, 20 pipe trench diggers and 20 women for bedding preparation, pipe laying, backfilling and testing). With this new rate of production it

meant that only 42 days were required to complete the pilot project. This team worked very well until the end of the fortnight (7 February 2003), when the labourers were due to be paid. It was at this point that a gap was identified: it was necessary to appoint a salary clerk and this was done immediately.

4.3.8 CHALLENGES THAT FACED THE PILOT PROJECT

Many challenges faced the pilot project. The main ones were:

- Proper team balancing was not performed before implementation and when setting out tasks.
- Although international experience (de Veen 1980, 1983) was taken into account in setting the daily task, fear of failure played a major role in reducing the task.
- Even though on-the-job training was provided to Supervisors and/or Overseers, the duration of the pilot project was too short to evaluate its effectiveness. McCutcheon (1991, 1992, 1993) suggests that a minimum of one (1) year for a municipal project is required to adequately assess effectiveness.
- Task determination, which took place during the pre-implementation stage by conducting trial excavations on site, was not supposed to have been performed by the same labourers who would be working on this pilot project, because it was misleading as, during the trial, it took some of the labourers almost an entire day to complete one 3.5 m^3 task. However, during implementation, the same labourers could complete up to three (3) tasks in a day.
- The involvement of permanent Council personnel to perform duties, such as the Storeman (to assist with issuing of material) and Salary Clerk (to issue payments), put more strain on the officials involved, even though they were paid extra for carrying out these additional duties.
- Resistance from what McCutcheon (1992) calls “business as usual” in Modimolle was also a big challenge. Amongst these people were the Divisional Manager for Water and Sewer, and the Divisional Manager Public Works – both are engineers by profession and were from the Technical Department – while, from the Finance Department, both the Salary Clerk and Divisional Manager Expenditure were not in support

of the use of labour-intensive methods of construction, claiming they are time consuming (inefficient), would require more administration and that the end product (quality) would be inferior.

- Lack of skilled and semi-skilled personnel locally with knowledge and experience of labour-intensive construction methods also put pressure on the Programme Manager as there were times when he was required to work overtime to train Supervisors.

4.3.9 GAPS IDENTIFIED DURING THE PILOT PROJECT

A number of shortcomings were identified during the pilot project. They are:

- Although it was found that the task determined was too low, the fact that the wage was kept below the minimum in the province cancelled out this shortcoming.
- The fact that on-the-job training was provided only with regard to technical skills identified a need for formal training.
- Sourcing of more skilled and semi-skilled personnel was also identified as a gap, in particular people with labour-intensive expertise.
- A need for the project to have its own personnel and not to depend on a Council official was also identified as a shortcoming. Specifically the project needed its own Technicians, Salary Clerks, Project Administrators, Project Manager and Artisans.
- Even though a team-balancing exercise was performed prior to implementation of the pilot project, it was not handled properly because the task determined was not revised prior to commencement of the main projects.
- There was a communication gap between the Finance Department and Technical Department with regard to the recording of completed tasks on the time sheets.
- The time allocated for planning, due to time constraints, and the fact that municipalities were not allowed to do multi-year budgeting or to roll over funds into the next financial year were also found to hamper labour-intensive projects.

4.3.10 EVALUATION OF PILOT PROJECT OBJECTIVES

When Council adopted the pilot project, the following were the project objectives:

- The use of labour-intensive construction methods.
- Training of local labour and transfer of skills.
- Creation of maximum employment for the local residents.
- Involvement of the local community on the project from initiation to close-out stage.
- Support of local businesses by procuring first locally in Modimolle, secondly in the Waterberg district if not available locally, thirdly provincially (Limpopo) if not available locally or in the district and, lastly, from elsewhere in South Africa.
- No compromise in the quality of the end product.

In order to evaluate the success of this project each objective will be looked at separately to establish whether it was achieved.

Training provided to the site Supervisors included:

- Setting out the works;
- Checking of levels and supervising trench excavation;
- Supervising bedding preparation;
- Pipe laying;
- Supervising blanketing;
- Supervising backfilling;
- Supervising compaction;
- Site supervision;
- Site administration duties;
- Health and safety courses, HIV and Aids awareness courses and
- Supervising concrete handling.

4.3.10.1 UTILISATION OF LABOUR-INTENSIVE CONSTRUCTION METHODS

The concept of labour-intensive construction was promoted adequately prior to the implementation of the project; the Ward Councillors went through their various wards to explain Modimolle's approached after Council passed the resolution. During implementation, consensus was reached by all parties involved, and/or all stakeholders with regard to conditions of employment and remuneration.

4.3.10.2 TRAINING OF LABOURERS AND TRANSFER OF SKILLS

Even though no formal training of the labourers was done on this project, on-the-job training took place and all those who were involved acquired technical skills with regard to site clearance, excavation, bedding, pipe laying, blanketing, backfilling and compaction. Other than these technical skills the labourers were also trained with regard to health and safety issues.

4.3.10.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

Modimolle's approach in itself allowed maximum use of local community members, because no contractor was involved. If contractors are involved, often they make excuses that their unskilled labourers must also be involved. In the case of employment creation within the local community, this objective was achieved.

- None of the activities on this project was done using conventional methods, every task was performed labour intensively. For example, compacting the sides of the pipes was done using man-made, hand-held steel compactors. This was very effective as the hand-held compactors were manufactured locally (Figure 4.2) while, for the rest of the backfill, a hand-held Wacker and hand-held compactors were used.
- To check compaction, a dynamic cone penetrometer test was used. Testing pipes in itself is labour-intensive and this was also carried out.



Figure 4.2: Hand-held, locally made steel compactor

4.3.10.4 INVOLVEMENT OF LOCAL COMMUNITY

The local community was involved because:

- The IDP processes forced the municipality to consult with their local community, from planning to completion, on all their planned projects.
- In Modimolle the consultation stage was taken seriously and hence Modimolle's IDP was regarded as one of the best in Limpopo Province.
- Prior to implementation, the Ward Councillor where the project was to be implemented called public meeting to brief people within his/her ward about the details of the project.
- Municipal officials were invited to these meetings to assist Ward Councillors, in case communities asked technical questions.
- This objective was also achieved, as the local community was involved from the initial stage of this project until close-out.

4.3.10.5 SUPPORT OF LOCAL BUSINESS

The procurement policy of Modimolle, with regard to Local Economic Development, stipulates that on procuring goods first preference must be locally, then from within the district, then provincially and lastly from anywhere within South Africa.

During the implementation of this pilot project this was achieved as all material which could be sourced locally was purchased from local businesses and the money was rotated locally. The reasoning behind this was that these businesses are paying rates and taxes and, by supporting them in this manner, it keeps the Municipality's economy strong.

4.3.10.6 QUALITY OF THE END PRODUCT

A high-quality end product was achieved because:

- The people responsible for the maintenance after project completion were also involved on this project as they undertook quality checks and quality assurance.
- The Technician who was seconded to work on this project was also the leader of the Maintenance team at the Water and Sewer Section of the Technical Department.
- From the interviews which were conducted with Municipal officials involved with regard to quality, the personnel indicated that this project's quality was one of the best ever, since they were more involved on the project than when projects were outsourced to contractors.

4.2.10.7 PROJECT OUTPUT

The Phagameng Extension 5 and 6 project output is summarised in Table 4.5. The cost breakdown for this project is given in Table 4.6.

Table 4.5: Phagameng Extension 5 and 6 project output as at 31 March 2003

Activity	Planned	Achieved
Duration	8 months (November 2002 to June 2003)	5 months (November 2002 to March 2003)
Cost	ZAR1 million	ZAR0.56 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water	520 standpipes with a water meter in each yard	520 standpipes with a water meter in each yard
Money to be retained in Modimolle	60 % of the budget due to water meters not being available locally	80 % of the budget due to water meters not being available locally
Employment created	2 200 man-days	1 848 man-days

Table 4.6: Phagameng Extension 5 and 6 project cost breakdown as at 31 March 2003

Activity description	Amount ZAR	Amount as a %
Professional fees	0	As the design was already done during the reticulation of the first 280 stands
Training cost	0	Only-on-the-job training was performed
Overhead cost	60 000	10.71 % of the project cost
Total indirect cost	60 000	10.71 % of the project cost
Total construction cost excluding indirect cost	500 000	89.29 % of the project cost
Direct cost to labour paid as wages	68 200	13.64 % of the project cost
Amount retained as saving (profit)	440 000	44 % of the approved project budget

The proportion of funding (13.64 %) that went to labour (in terms of wages) on this project was ZAR68 200, being the amount that was invested in local labourers.

Council saved ZAR440 000 on this project by implementing it internally. Had the project been outsourced, that saving would have become the Contractor's profit.

4.3.11 IDENTIFYING INDICATORS OF SUCCESS

The following identifying indicators of success were noted from the pilot project:

- The fact that the local community was involved from the initial stage of the project to close-out indicates success.
- The long-term political support by Council to approve the implementation of all their capital projects using labour-intensive construction methods indicates Council's commitment to use labour-intensive methods of construction.
- The appointment of all unskilled labourers from the local community indicates the success in reducing unemployment.
- The fact that 80 % of the project cost was retained in Modimolle also indicates how well the objectives were achieved.
- The three (3) month saving on the total project duration indicates the potential effectiveness of labour-intensive construction methods.
- The huge cost saving which was realised at the end of the project indicates how cost effective a labour-intensive project can be when compared with conventional methods.
- The quality of the end product was of a high standard and highly competitive when compared with conventional methods and this indicates the extent of how this project achieved its original goals, with regard to quality control.
- International experience and local expertise was consulted prior to the implementation of this project, showing how committed the Modimolle Local Municipality was to achieving their goals.

From the lessons learnt in this chapter, together with the gaps or indicators of failure identified, it was the Modimolle Local Municipality's main objective to close those gaps through identifying, improving and working on them. This pilot project may be taken as the base for future projects and, if the lessons learnt are properly applied, it can improve the outcome of future labour-intensive projects even further.

Chapter 5 introduces the next projects which were implemented labour intensively in Modimolle Local Municipality after completion of the pilot project. The problems encountered and successes are documented. Chapter 5 concludes by referring back to those gaps identified during the pilot project and the extent to which they were addressed to avoid repeating the same mistakes.

CHAPTER 5:
MODIMOLLE LOCAL MUNICIPALITY
LABOUR-INTENSIVE PROJECTS

This chapter focuses on the eight (8) labour-intensive projects that were implemented in Modimolle Local Municipality after the successful implementation and completion of the pilot project. It evaluates the five (5) water and the three (3) sewer projects and concludes by making recommendations from the lessons learnt and the pilot project for future projects and programmes.

5.1 PHAGAMENG EXTENSION 7 LETŠEMA WATER AND SEWER PROJECT (APRIL 2003 TO MARCH 2004)

Phagameng Extension 7 is a township within Modimolle Local Municipality, which is about 5 km from the centre of town.

This township consists of 755 low-income stands and covers 90 ha. The successful completion of the Phagameng Extensions 5 and 6 pilot project encouraged the Council to implement the Phagameng Extension 7 project using the same principles of labour-intensive construction methods.

5.1.1 PROJECT DETAILS

The project details were:

Project name	Phagameng Extension 7 Letšema water and sewer project
Approved budget	ZAR6.84 million
Project sponsor	Department of Local Government and Housing Limpopo Province, under the Human Settlements Programme
Client	Modimolle Local Municipality
Consultant	Dombo, du Plessis & Partners (Africa) (Pty) Ltd
Contractor	Modimolle Local Municipality

5.1.2 BACKGROUND TO THE PROJECT

During the period April 2002 to March 2003, Dombo, du Plessis & Partners (Africa) (Pty) Ltd approached the Council of Modimolle to request permission to submit a business plan on their behalf (at risk) to apply for funding to provide full services at Reconstruction and Development Programme standard (water, sewers, roads and stormwater) to Phagameng Extension 7. During this period, Phagameng Extension 7 township was fully established and proclaimed in terms of the town-planning processes. Before Council was approached by the consultant to source funding for them, this area had been earmarked for development in the 2004/2005 municipal financial year. Following the approach, Council saw this as an opportunity and a way to relieve the budget constraints that they had.

Council gave the consultant the necessary permission and funds were approved under the Human Settlements Programme. The Human Settlements Programme was a programme within the Department of Housing aimed at fast-tracking housing delivery, where municipalities made land available. Township establishment, and provision of full services at Reconstruction and Development Programme standard, were done under the Human Settlements Programme, so that when houses are allocated in the area, all basic township services are already in place. When the funds were approved, the following conditions were attached:

1) The Memorandum of Understanding was to be signed between the provincial department (Department of Local Government and Housing) and the municipality regarding these conditions before the project could start.

2) The procurement of services was to be done in line with Council's policy and the provincial department need only be notified.

3) No money would be transferred to the municipality for payment of any services: all service providers were to be paid directly by the Department of Housing's provincial Department of Local Government and Housing.

4) All invoices were to be made out to the provincial department, and municipalities were responsible only for certifying that the works had been completed.

5) The project was to be completed on or before the end of March 2004, as no roll-over of funds would be permitted.

As this was a conditional grant, Council complied with all the stipulated conditions, and Dombo, du Plessis & Partners (Africa) (Pty) Ltd were given permission to undertake detailed design and project specifications and construction supervision. By the end of April 2003 the design was complete and had been presented to the Municipality and approved.

This project was divided into three (3) main components:

1) Sewer reticulation to 755 stands in Phagameng Extension 7, which included the construction of 160 mmØ sewer pipes.

2) Main outfall sewer. The brief scope included 284 m of 450 mmØ class 100D reinforced concrete pipes and 376 m of 600 mmØ class 100D reinforced concrete pipes which were to be jacked beneath the Spoornet main passenger and goods railway line.

3) Water reticulation to 755 stands in Phagameng Extension 7, which included the construction of 75 mmØ UPVC pipes, including Erf connections and meters.

5.1.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR

An analysis of the project in line with Council's objectives is presented below:

5.1.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

The concept of labour-intensive construction was adequately promoted when a resolution of Council was passed to the effect that, should the pilot project be successful, all other projects would adopt this method of construction. The word "Letšema" was used to describe labour-intensive construction in Modimolle. It is a Northern Sotho word which describes a "team" of men and women who work to achieve a certain goal. For example, in years gone by a King would have his farm cultivated by his people and, when the crops were growing, the weeds would also grow, so the team of men and women who were doing the farming and weeding at the King's farm used to be called "Letšema". The labour-intensive projects in Modimolle had the word "Letšema" as an extension to them to indicate how serious Council was about promoting the labour-intensive concept.

5.1.3.2 TRAINING OF LOCAL LABOURERS

For labour-intensive training, it was agreed that a certain amount of budget – 2 % – be set aside on this project for accredited training, and this was achieved in that the actual figure was 2.42 % of the project cost.

The accredited trainer with the Construction Seta was also appointed, and fortunately the appointed Consultant on this project – Dombo, du Plessis & Partners (Africa) (Pty) Ltd – was accredited as service providers by the Construction Seta.

- The following formal training was covered:
    1) Setting out the works (Supervisors);
    2) Trench excavation (Labourers and Supervisors);
    3) Bedding preparation (Supervisors);
    4) Pipe laying (Supervisors);
    5) Blanketing (Labourers and Supervisors);

6) Backfilling (Labourers and Supervisors);

7) Compaction (Labourers and Supervisors);

8) Site Supervision (Supervisors);

9) Site administration duties (Supervisors);

10) Health and safety courses, HIV and Aids courses (Labourers and Supervisors), and

11) Concrete handling (Labourers and Supervisors).

- The training was structured in a manner that allowed, or gave, workers an opportunity to attend formal classes and thereafter to do practical work on site.
- Training was compulsory and, since labourers were paid a daily task wage even when they were attending classes, this encouraged them to participate in the training.
- Over and above the training budget of ZAR136 800 (2.42 % of the project cost) which was made available on this project, Council approached the Department of Labour to train and capacitate local labourers.
- The Department of Labour's commitment to training was long-term and more intensive than Council's because they had enough budget for training but most government departments were not using this opportunity.
- Annually the Department of Labour was rolling-over funds for training so, when Modimolle approached them, this was also a relief to them.
- The Department of Labour had on their database a list of accredited service providers who they could appoint and introduce to Council to perform training.
- Apart from this formal training Modimolle took a decision to retain all the labourers who worked on the pilot project (Phagameng Extensions 5 and 6 Letšema Water Project), in order to ensure continuity.
- On-the-job training also continued and was intensified.
- As part of training, Modimolle Local Municipality took advantage of the fact that students from the Universities of Technology needed

in-service training to complete their Diplomas. This project had three (3) students who were taken on as trainees.

- To strengthen the team and the on-the-job training, a Project Manager, Ms Mpho Lekoloane (see Section 2.2.2.2), who worked on the Gundo Lashu[9] programme was head-hunted to be part of this project and she added much value to this project. A brief curriculum vitae for Ms Lekoloane is provided in Annexure A.

5.1.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

Maximum employment was created for the local community:

- The employment created for the local community on this project was three (3) times the number of labourers who had been employed on the pilot project.
- A total of 120 labourers was appointed for the 12 months duration of this project. This number excluded in-service training students and the project manager.
- 31 680 man-days were achieved on this project for local labourers.

5.1.3.4 INVOLVEMENT OF LOCAL COMMUNITY

The Modimolle Local Municipality made a specific effort to involve the local community:

- Modimolle Local Municipality's record with regard to community participation was very good: it starts from the IDP stages when the project is identified and extends to project close-out.
- On this project the consultation process, where Ward Councillors invite the entire local community and other affected role players, was followed diligently.

[9] "Gundo Lashu" was the first long-term labour-intensive public works road sector programme in South Africa, where emerging contractors were given extensive formal training and a series of practical on-site training projects in labour-intensive road works over a period of 21 months (Ngebulana 2007, Annexure A).

- The community's support played a crucial role and was not neglected.
- The community was included throughout all the project stages.

5.1.3.5 SUPPORT OF LOCAL BUSINESS

Local business was supported by this contract as the materials were purchased locally through Council's procurement policy, which emphasised the support of local businesses.

5.1.3.6 QUALITY OF THE END PRODUCT

The Modimolle Local Municipality took particular care to ensure an acceptable quality of the end product as:

- Modimolle adopted a client-based approach and the project consultant was given supervisory duties.
- Quality monitoring and assurance were undertaken from both the consultant's side and from the Client's perspective.
- According to the project consultant, the quality of this project was one of the best amongst similar projects they had implemented previously.
- The Project Sponsor (the Department of Local Government and Housing) was happy with the method statement, quality control measures or plan, and the commitment not to compromise quality by project team members.
- While quality was given a priority, issues of health and hygiene also received appropriate attention to ensure compliance with safety standards.

5.1.3.7 PROJECT OUTPUT

The Phagameng Extension 7 project output is summarised in Table 5.1. The cost breakdown for this project is given in Table 5.2.

Table 5.1: Phagameng Extension 7 project output as at 31 March 2004

Activity	Planned	Achieved
Duration	12 months April 2003 to March 2004	12 months April 2003 to March 2004
Cost	ZAR6.84 million	ZAR5.64 million
Quality of end product	High standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water and sewers	755 Stands	732 Stands (Water and sewer services could not be provided to the remaining 23 stands because they were in a waterlogged area)
Money to be retained in Modimolle	80 %	85 %
Employment created	30 000 man-days	33 000 man-days

Table 5.2: Phagameng Extension 7 project cost breakdown as at 31 March 2004

Activity description	Amount ZAR	Amount as a %
Professional fees	957 600	16.98 % of the project cost
Training cost	136 800	2.42 % of the project cost
Overhead cost	342 000	6.1 % of the project cost
Total indirect cost	1 436 400	25.47 % of the project cost
Total construction cost excluding indirect cost	4 203 600	74.53 % of the project cost
Direct cost to labour paid as wages	1 201 200	28.58 % of the project cost
Amount retained as saving (profit)	1 200 000	17.54 % of the approved project budget

The proportion of funding that went to labour (in terms of wages) on this project was ZAR1.201 million (28.58 %), plus ZAR136 800 paid for training which totals ZAR1.34 million, being the amount that was invested in local labourers.

Of the total project cost, 31.00 % was spent on labour (excluding overheads, professional fees and other indirect costs), which was a great achievement when considering that a saving of ZAR1.2 million was achieved.

The direct construction cost on this project was ZAR4.20 million, while the cost of fully servicing a stand with both water and sewer, including basic road and storm-water drains, was ZAR7 705, which was within the Human Settlements guidelines of ZAR9 000 per stand.

5.1.3.7 ANALYSING THE PROJECT OBJECTIVES

The project objectives were analysed using the "SMART" principle, where "S" represents "Specific", "M" represents "Measurable", "A" represents "Attainable", "R" represents "Realistic" and "T" represents "Time". The individual objectives are discussed below.

5.1.3.7.1 SPECIFICITY

The project objectives were *specific* in that they clearly spelled out the methods of construction, documents were drafted, documented and amended in a manner that accommodated the use of labour-intensive construction methods.

5.1.3.7.2 MEASURABILITY

- The project objectives were *measurable* as, at the beginning of the project, targets were set with milestones, and one of the targets was to create 30 000 man-days of employment for local labourers.
- The consultation with the local community was also measurable in the sense that they had buy-in to the implementation of this: at no stage was the project stopped by the community.
- With regard to training it was also measurable, because targets were specified relating to the training to be covered, and indeed this was exceeded.

5.1.3.7.3 ATTAINABILITY

- The fact that all the targets were reached on this project, some even exceeded, indicates that the project objectives were *attainable*.
- Table 5.1 indicates what was planned, against what was achieved, from which it is clear that most of what was targeted for was exceeded.

5.1.3.7.4 RELEVANCE

- The project objectives were *relevant* to Council's goal of reducing the high level of unemployment and also building capacity with regard to training local unemployed residents.
- Training identified on this project was also relevant to the method of construction adopted by Council.

5.1.3.7.5 TIME CONSTRAINTS

- The project had a strict *time frame* as it was required to be completed within 12 months.
- The project was implemented within this time frame, without compromising quality, safety and with project saving.
- The project was done without the use (or assistance) of large construction equipment, but it was completed within the time frame, and without working on Saturdays, Sundays and public holidays.

5.1.4. THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

Lessons learnt from previous projects contributed to the success of the project as follows:

5.1.4.1 TASK DETERMINATION

- The excavation task was set at 3.5 m^3/task at a rate of R35 per task. This amount was not changed as all labourers who worked on the pilot project continued to work on this project.

- Payment per task ensured that stronger, more energetic labourers were rewarded for their efforts as they could complete several tasks per day although the task completion rate depended on the geotechnical conditions of the area in which they were working.
- Lessons learnt at the research and development stage were that, for future projects at the pilot-project stage, different people should be used to determine the task to those who will be involved at the programme's implementation to ensure that the scope of the task is correctly assessed.
- Even though the scope of the task was too small, considering the geotechnical conditions of Phagameng, the fact that the wage rate was also low (below the provincial rate) resulted in a saving and the project being cost-effective.

5.1.4.2 TEAM BALANCING

- The success of the team-balancing exercise that took place at the beginning of the pilot project played an important role in the efficiency of this project.
- The reason the labour force was increased by multiplying the number of labourers in a team by three (3) was that the pilot project worked well with a team consisting of 40 labourers. Thus, to increase the task completion output, one simply multiplied the number of labourers in a team by a predetermined multiplier. For this project, three (3) was chosen as the multiplier because a team of 120 labourers could be supervised effectively by two (2) supervisors.

5.1.4.3 SKILLS TRANSFER

- The pilot project was successful because the knowledge acquired in the pilot stage could be, and was, taken forward to project implementation.
- It was found during the implementation of this project that those who worked on the pilot project were more skilled than the newly recruited labourers, even when it came to interpreting the drawings and the specifications.

- The introduction of a project manager with extensive experience on labour-intensive construction methods also played a big role, with regard to skills transfer.

5.1.4.4 PAYMENT OF LOCAL LABOURERS

- During the implementation of the pilot project, all the labourers were paid in cash at the Municipal Stores. Payment was made fortnightly.
- With the team having increased threefold from the pilot project, fortnightly cash payments were no longer feasible so payment was made electronically into the bank accounts of the labourers. The labourers were still paid fortnightly.
- The Finance Department was also familiar with the task-based timesheets that were used. Council temporary workers' timesheets were adjusted from a daily-paid basis to paid-per-task basis, which was also introduced at the project pilot phase.

5.1.4.5 RETENTION OF SKILLS

- Council had a long-term goal of making this programme work. They adopted a policy to recruit from Letšema water and sewer projects whenever vacant posts were to be filled in their Water and Sewer Section.
- Council also adopted the principle of "training the trainer" so the retention of these skilled labourers also played a major role in training new technicians from the Universities of Technology.
- This strategy worked well, because the Project Manager, who was head-hunted from Gundo Lashu (Sections 5.1.3.2 and 5.1.3.4) ended up heading the Housing Section in the Technical Department, while the three students from the Universities of Technology (who were also recruited for in-service training) were appointed permanently as technicians in the Water and Sewer Section of the municipality.

5.1.4.6 HEALTH AND SAFETY ISSUES

- With the current Government emphasis on safety at the workplace and compliance with the Occupational Health and Safety Act, Act No. 85 of 1993 (RSA 1993) and its amendments, Council showed their intention

of not compromising safety by prioritising training on occupational health and safety.

- In addition to training, the involvement of a professional service provider of Dombo, du Plessis & Partners (Africa) (Pty) Ltd's calibre as a safety consultant indicated that Council was serious about implementing projects using labour-intensive methods.
- This project was completed without any injuries or near-miss incidents.

5.1.4.7 TOOLS AND EQUIPMENT

- Hand-held compactors were manufactured locally by a steel company, and were used to compact the soil to each side of the pipes that had been laid.
- Compaction on top of the blanket layer and up to the top was also done using a small hand-held steel compactor and/or a Wacker, which was labour intensive.
- To obtain the correct moisture content of the soil for compaction a small water trailer, hooked to and pulled by a light delivery vehicle (a "bakkie" in South African terminology) was used to dampen the soil. The same vehicle was used when pressure testing the water lines.
- A dynamic cone penetrometer test was used to check the compaction.
- For pressure testing the water lines, a water pump was used which was not labour-intensive but it was the only way the water lines could be pressure tested.
- For rock excavation, jack hammers with compressors were used to break rocks, which was also labour-intensive.
- The only plant that was used on this project was a Tractor-Loader/Backhoe (TLB), which was necessary to lift the concrete pipes on the main outfall sewer line.
- Dumpy levels were used for marking levels and placement of profiles for excavations. After levels were set on the profiles, fishing line attached to rods was used to control and check the levels.
- All small tools and equipment were sourced from local suppliers, including the TLB.

5.1.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

- Because the Client adopted a client-based method of construction, the use of SMMEs was not successfully implemented in line with Council's IDP. Thus, although the IDP recommends the use of SMMEs, it was decided that the use of labour-intensive construction methods was so innovative that it needed to be demonstrated first using in-house capacity ("force account" system).
- No sub-contracting of local sub-contractors took place on this project as labourers were sourced locally from the community and the Client retained the administration of the entire project.
- Although there were opportunities for sub-contracting other parts of the work (such as the construction of Erf connections, for example) to local and emerging contractors, this was omitted or overlooked as more emphasis was placed on direct employment.

5.1.5 CHALLENGES ENCOUNTERED ON THE PROJECT

A number of challenges or problems were encountered during the project:

- A high percentage of unskilled labourers due to the "earn as you learn" system that was adopted at the pilot project.
- Collapsing of the side walls of sewer trenches due to overloading of trench banks.
- A shortage of semi-skilled and skilled personnel with labour-intensive construction knowledge and experience to carry out engineering-related duties (such as site supervision, site administration, project management and other duties).
- Lack of support from provincial departments and some departments within the municipality. This took the form of what McCutcheon (1992) terms "business as usual", as those who did not want change and believed labour-intensive construction methods would not work, tried to convince the decision makers that the conventional methods of operation were the most economic and preferred option.

5.1.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

Because the municipality was so determined and focused to implement their projects labour intensively, every challenge was seen as an opportunity. Thus, in order to address the abovementioned challenges the following interventions were made:

5.1.6.1 UNSKILLED LABOURERS

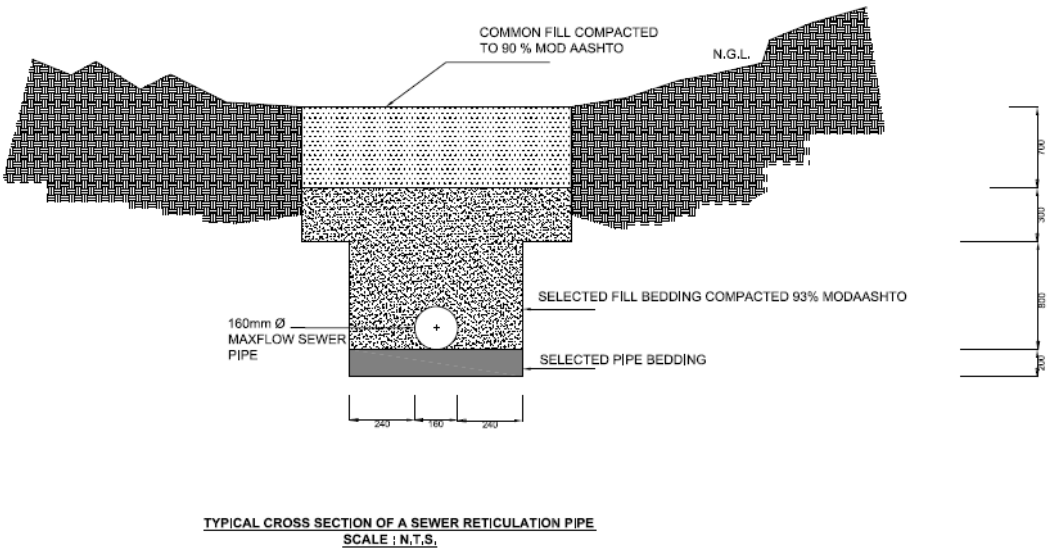
- Council introduced formal accredited classroom training with the assistance of Department of Labour funding, where emphasis was put on supervisory courses and technical courses (such as pipe laying, bedding preparation, blanketing, backfilling, pipe testing, plumbing, brick laying, concrete laying and manhole construction).
- On-the-job training was also effective where local labourers were trained how to use a dumpy level, how to prepare bedding, fill blanketing, pipe laying, backfilling in layers, testing of pipes, construction of manholes and site administration.
- The "earn as you learn" method worked well for the municipality and it was effective and successful.

5.1.6.2 COLLAPSING OF TRENCHES

The project team introduced effective team balancing on site, where two (2) labourers dug trenches, with one (1) labourer on the bank above the trench throwing the excavated soil away from the trench to reduce trench-bank overloading.

5.1.6.3 DEEP EXCAVATION ON THE SEWER LINE

- The project team introduced the method to excavate the trenches in a step form as indicated in Figure 5.1.
- This method was most effective because it also helped with the problem of trench-bank overloading since a 2 m deep trench was excavated to two (2) different, stepped depths.



Source: Researcher's own diagram, based on site observation.

Figure 5.1: A cross-section of a sewer trench excavated in steps to prevent trench-bank overloading and the trench collapsing

5.1.6.4 SHORTAGE OF SKILLED PERSONNEL WITH LABOUR-INTENSIVE EXPERTISE

- The recruitment of a project manager from the Gundo Lashu programme (Sections 5.1.3.2, 5.1.3.4 and Annexure A) played a major role in addressing this challenge.
- The three (3) in-service training students recruited from the Universities of Technology (then known as Technikons), were of great assistance owing to the post-matriculation education they had received.
- Professor McCutcheon (2002) used to say, during his lectures at the University of the Witwatersrand, that "Post matriculation is crucial, even one (1) year post matric plays a very important role in a person's reasoning, ability and understanding." In Modimolle this was indeed evident in that all the in-service training students understood concepts faster than either the unskilled labourers or labourers with only a Grade 12 (previously known as Standard 10) certificate.

5.1.6.5 LACK OF SUPPORT FROM GOVERNMENT AND MUNICIPAL DEPARTMENTS

Before indicating what intervention was made in relation to this challenge, it is important to elaborate what exactly was a "challenge" with regard to lack of support. Prior to the start of the project it was indicated that a service-level agreement had to be signed with the Department of Local Government and Housing regarding the method of construction and also that no funds would be paid into a municipal bank account but, instead, service providers would be paid directly by the Department. All the invoices from the project consultant – including training service providers – were paid in full by the Department of Local Government and Housing, including invoices from material suppliers, and invoices for the purchase of tools and equipment.

The challenge arose when the Modimolle Local Municipality wanted to be reimbursed for the amount they had paid to the labourers as wages and as salaries to the municipal officials who were seconded to this project (the "force account" system) and also when they wanted to claim the ZAR1.2 million which was realised as a saving on this project. The Department of Local Government and Housing's Financial Department and Legal Department, interpreted the matter differently and said this would be in breach of the service level agreement signed between the two parties.

But, with the support from the Mayor and Councillor responsible for infrastructure at Modimolle Local Municipality, after they had a meeting with the Member of Executive Council for the Department of Local Government and Housing, the service level agreement was amended in order to resolve this challenge. Since there was political support, this project was never stopped due to lack of funds or labourers not being paid. Instead, Council money was used to address the funding until the challenge was resolved and all outstanding money was paid to Modimolle by the Department of Local Government and Housing.

5.1.7 OVERALL PROJECT OUTPUT

By March 2004, the Extension 7 Letšema Water and Sewer Project had achieved:

- Creation of 33 000 man-days of temporary employment.
- Water reticulation to the entrances of 732 stands in Phagameng Extension 7 and 732 sewer connection points were also provided.
- Roads and stormwater drainage were also provided at a Reconstruction and Development Programme level of services (opening of roads, gravelling and stormwater provision).
- The training that took place ensured that, by the end of this project, sufficient skilled and semi-skilled personnel were developed from both formal and informal (on-the-job) training.
- This project was successful and Modimolle won first prize in the 2003/2004 Vuna Awards because of it and the pilot project (Figure 5.2).



Figure 5.2: From left: the Corporate Director, Chief Financial Officer, Social Director, Municipal Manager and Technical Director of the Modimolle Management Team holding the Modimolle Vuna Award cheque

5.2 PHAGAMENG EXTENSION 8 LETŠEMA WATER AND SEWER PROJECT (APRIL 2004 TO JUNE 2005)

Phagameng Extension 8 is a township within the Modimolle Local Municipality directly opposite Phagameng Extension 7. The two (2) extensions are separated by a street (Joe Slovo Street), which is the main street from Modimolle town into Phagameng Township. This township consists of 1 592 low-income stands and 300 middle-income stands covering 113 ha but, for the purpose of this research report, the 300 middle-income stands were not covered as Council decided during implementation to out-source this contract for the purpose of developing emerging contractors and SMMEs.

5.2.1 PROJECT DETAILS

The project details were:

Project name	Phagameng Extension 8 Letšema Water and Sewer Project
Approved budget: Initial	ZAR3.74 million
Approved budget: Additional	ZAR1 million
Approved budget: Total	ZAR4.74 million
Project sponsor	Department of Local Government and Housing under the Consolidated Municipal Infrastructure Programme and the Municipal Infrastructure Grant
Client	Modimolle Local Municipality
Consultant	Phala Consulting Engineers
Contractor	Modimolle Local Municipality

5.2.2 BACKGROUND TO THE PROJECT

The introduction of the EPWP saw the South African national government introducing a financial plan to provide infrastructure funding to this programme: the Municipal Infrastructure Grant. Prior to the introduction of the Municipal Infrastructure Grant, the national government used to provide funding for infrastructure to municipalities through the Consolidated Municipal Infrastructure Programme (which focused more on water, sewers, roads, storm water and other infrastructure), while the Department of Minerals and Energy funded only electricity projects. The then (in 2002) Department of Water Affairs and Forestry funded water and sewer projects relating to their schemes. The Human Settlements Programme funded housing-related developments. The Municipal Infrastructure Grant consolidated most of these sources of funding into one national fund for provision of basic infrastructure to municipalities. This was a conditional grant aimed at supporting the municipality to fast-track service delivery and, unlike other grants (such as the Consolidated Municipal Infrastructure Programme), the Municipal Infrastructure Grant allowed for multi-year budgeting, where projects could be implemented over a period of three (3) years or more, while, with other grants, funds were required to be used in that year, or a municipality had to apply for roll-over (which was a long-process) if a project could not be completed in the same year.

- Phagameng Extension 8 Letšema water and sewer project's first budget was an amount of ZAR3.74 million that was approved under the Consolidated Municipal Infrastructure Programme.
- Initially when Council applied for funding to the Consolidated Municipal Infrastructure Programme, the aim was to provide water at a Reconstruction and Development Programme level of service only, to the informal settlement, as the township was not properly formalised. Most of the people who were staying at this extension were former farm workers who had been evicted from various farms within the Municipality.
- When Extension 7 stands were serviced, it was Council's intention to relocate people who had informally allocated themselves stands in Extension 8, where there were twice as many people staying as in Extension 7.

- With the approved budget of ZAR3.74 million, Council decided to formalise the Extension 8 township and peg it *in situ* and not to relocate anyone. However, with the available budget being insufficient (it was supposed to cover pegging, formalising the township and providing basic infrastructure services), additional funding had to be applied for under new funding, the Municipal Infrastructure Grant.
- The only challenge become the fact that the conditions for the two (2) fundings were substantially different: the Municipal Infrastructure Grant focused on basic infrastructure at Reconstruction and Development Programme level, while the Consolidated Municipal Infrastructure Programme used a formula to allocate funding to the municipalities, and it was then up to the municipality concerned as to how they allocated available funding to their infrastructure. So the Municipal Infrastructure Grant regarded waterborne sewers as a high level of service (above Reconstruction and Development Programme level) and they needed the municipality to come up with counter funding. Fortunately with the saving that was realised at Extension 7, Council had no challenge in providing the additional funding required.

5.2.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR

Several aspects – in line with the Council's objectives for the project – are analysed below:

5.2.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

- Council took a resolution to replicate the Phagameng 7 labour-intensive project, and, therefore, a decision was made to keep the same personnel who worked at Extension 7, as most of them were well trained, and also to use the same construction methods, that saw Council making a saving of ZAR1.2 million.
- The concept of labour-intensive construction was therefore adequately promoted, considering that the local community was well informed about the methods to be used.

5.2.3.2 TRAINING OF LOCAL LABOURERS

- The Council's decision to retain all the labourers that worked at Extension 7, as all the labourers had received compulsory training, ensured that additional training was added to the skills which were already there.
- Formal training in the form of accredited training was sponsored by the Department of Labour, which was further followed by practical training on site.
- There was effective training for Technical, Supervisors and administration duties, due to sufficient funds having been budgeted and made available by the Department of Labour.
- The training that took place at Modimolle drew national attention: the Minister of Labour, Mr Membethisi Mphumzi Shepherd Mdladlana, visited the Extension 8 Letšema water and sewer project on 10 May 2005 (Figure 5.3).
- The Minister's visit took place because, at that stage, Modimolle was leading with regard to spending the Department of Labour's budget allocated nationally, and was also as a result of Modimolle continually benefiting from his Department's budget in terms of formal training. Therefore everybody wanted to see whether the training that was taking place was value for money.
- Over and above formal training, which was funded by the Department of Labour, on-the-job training continued on this project.
- To improve capacity of the Supervisory personnel or Overseers, three (3) more students were recruited from the Universities of Technology.
- Training was effective: this was confirmed by the fact that one (1) Head of Department from each of the Pretoria University of Technology, the Vaal University of Technology and the Durban Institute of Technology visited their students on this project and they were impressed about the standard of training that their students were receiving.



Figure 5.3: From left: the Modimolle Mayor, Technical Director, Project Manager and the Minister of Labour during their visit to Modimolle on 10 May 2005

5.2.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

This objective was achieved in that a total of 120 local labourers was retained from Phagameng Extension 7 and they worked for a period of 15 months – which was three (3) months more than the Extension 7 employment created for locals – the equivalent of 42 570 man-days.

5.2.3.4 INVOLVEMENT OF LOCAL COMMUNITY

- The process for the implementation of projects in Modimolle was formal and well documented in the IDP processes. On this project, the Project Steering Committee was established in accordance with formal Council processes.
- The fact that pegging of stands, formalising of townships, and provision of infrastructure were taking place in an area where people were illegally occupying stands, made it very difficult to implement this project. Hence, consultation with the local community was well structured and intensified, in order to move some people permanently from their current stands and relocate them to a new site nearby.

Services were supplied to the new residential site to Reconstruction and Development Programme level.

- Indeed, through the Project Steering Committee, Ward Councillor and Ward Committee members, Council managed to obtain "buy-in" from the local community and the project ran smoothly, with few delays.

5.2.3.5 SUPPORT OF LOCAL BUSINESS

On this project Council's procurement policy was adhered to, which ensured the development and promotion of local business, as all the goods, materials, tools and equipment that were available locally were purchased locally.

5.2.3.6 QUALITY OF THE END PRODUCT

On this project the project consultant, Phala Consulting Engineers, was allocated the responsibility to supervise and monitor the project to ensure quality control.

The quality on this project was of a higher standard than that of Phagameng Extension 7 because the labourers on this project were more skilled than those who worked on Extension 7 and more supervisory personnel were available due to the effective training that took place.

5.2.3.7 PROJECT OUTPUT

The Phagameng Extension 8 project output is summarised in Table 5.3. The cost breakdown for this project is given in Table 5.4.

Table 5.3: Phagameng Extension 8 project output as at 30 June 2005

Activity	Planned	Achieved
Duration	12 months (April 2004 to March 2005)	15 months (April 2004 to June 2005)
Cost	ZAR3.74 million	ZAR4.74 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water and sewers	1 592 stands	1 592 stands
Money to be retained in Modimolle	85 %	80 %
Employment created	31 680 man-days	42 570 man-days

As mentioned above the original approved budget was ZAR3.74 million, which was for water provision to 1 592 individual stands. However, during implementation it was decided that sewer must be included. Hence, there was a need to top-up the originally approved funds.

Roads and storm water and township establishment were catered for within the capital budget of the municipality and their cost does not form part of this report.

When compared with the previous project (Phagameng Extension 7) that had a saving of ZAR1.2 million – though the total number of stands serviced was 117 % fewer than in this extension – it was concluded that the Phagameng Extension 8 project was more successful and better implemented than the Extension 7 project.

Thus, an additional ZAR1 million – approved under the Municipal Infrastructure Grant funding – was necessary and cannot be regarded as a budget over-run, because the cost of fully servicing a stand with both water and a sewer as per the Municipal Infrastructure Grant guideline was ZAR2 200 and ZAR3 300, respectively, all costs included. On this project it cost Council only ZAR2 977 for servicing the stand with

both water and sewer, which was a saving of 54.13 % when compared with the Municipal Infrastructure Grant guidelines.

Table 5.4: Phagameng Extension 8 project cost breakdown as at 30 June 2005

Activity description	Amount ZAR	Amount as a %
Professional fees	523 600	11.05 % of the project cost
Training cost	0	Was provided by Department of Labour
Overhead cost	187 000	3.94 % of the project cost
Total in direct cost	710 600	14.99 % of the project cost
Total construction cost excluding indirect cost	4 029 400	85.01 % of the project cost
Direct cost to labour paid as wages	1 716 750	42.61 % of the project cost
Amount retained as saving (profit)	0	No saving was realised

The proportion of funding (excluding overheads, professional fees and all other indirect costs) that was invested in local labourers in the form of wages on this project was 42.61 % of the project cost (amounting to ZAR1.717 million), which was a good achievement when compared with the >50 % achieved by Botswana and Kenya.

5.2.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

5.2.4.1 TASK DETERMINATION

The task that was determined at pilot stage and the Phagameng Extension 7 Letšema water and sewer project was kept unchanged at 3.5 m³/task for ZAR35. The reason for the task remaining unchanged was that, when the Programme Manager went to the Management Committee to request that the task and the rate be amended to be in line with research and the development stage (pilot project) and the recently completed project, his suggestion was rejected because:

- According to Council standing rules, once a decision has been taken by Council, for it to be rescinded it needs to go the same route of first being presented to the Executive Committee of Council and then to the Council at which meeting the majority of Councillors must be present.
- Any item that had a cost implication, which in this case was the rate, would require a budget adjustment, which process required that the whole IDP processes need to be followed, and all the stakeholders mentioned above under the IDP processes must participate to make any amendments and approve the rate and management was not prepared to follow these processes again.
- Section 28 (1) and (2) of the Local Government: Municipal Finance Management Act, Act No. 56 of 2003 (RSA 2003) deals with reasons for municipal budget adjustments, and rate adjustments do not form part of those reasons.
- The concern raised concerning the rate adjustment was, however, noted and an agreement was reached by management that, during the next financial year's IDP and budget processes, this must be presented for approval.
- The only adjustment that was made was the rate per day for the seven (7) categories of Supervisor, who were produced by both formal and on-the-job training in the Phagameng Extension 7 project.

5.2.4.2 TEAM BALANCING

As Council decided to keep the unskilled labour force on this project unchanged at 120 local labourers, the same team-balancing exercise that was used on Extension 7 and the pilot projects was adopted.

5.2.4.3 SKILLS TRANSFER

- At the beginning of this programme, Modimolle Local Municipality adopted the policy of "training a trainer" and, to some extent, this worked.
- The Project Manager who was recruited from Gundo Lashu, together with the three (3) University of Technology students, who were

permanently employed by the Municipality, made themselves available to transfer skills to others.

- The skills transfer to the newly recruited University of Technology students was easy due to the availability of these trainers.
- Apart from receiving practical training, the students from the Universities of Technology were also given an opportunity to attend formal training (such as supervisory and health and safety courses).

5.2.4.4 PAYMENT OF LOCAL LABOURERS

- Even though there was a shortfall on the project budget, all local labourers were always paid on time from Council funding.
- The Project Steering Committee and Ward Committee members were given only a transport allowance of ZAR100 per meeting attended.

5.2.4.5 RETENTION OF SKILLS

Some of the workforce who worked on the previous project were not available (due to being recruited and joining the Municipality as permanent employees), while others had permanent employment elsewhere within Government departments or became employed in the Private Sector. However, about 90 % of the workforce was retained from the previous project.

5.2.4.6 HEALTH AND SAFETY ISSUES

- This service was outsourced to the project consultant, Phala Consulting Engineers, who ensured compliance with safety regulations.
- There were no major incidents or "near misses" that occurred on this project due to the commitment of all participants to health and safety issues.

5.2.4.7 TOOLS AND EQUIPMENT

- All the labour-intensive tools, which were specifically manufactured for Phagameng Extension 7, were used again on this project (including the Tractor/Loader/Backhoe (TLB)). Although there were no concrete pipes involved on this project, deep excavation and manhole construction necessitated the use of a TLB.

- The only other tools and equipment used on this project were hand-held compactors, dynamic cone penetrometers, Wackers, dumpy levels, jack hammers, breakers and compressors.

5.2.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

- The availability of 300 middle-income stands in this extension made it possible for Council to advertise and appoint emerging contractors to service them.
- After servicing the stands the appointed contractor was allowed to sell the fully serviced stands at a market-related price to cover their costs and some mark-up (profit).
- Council policy was followed to service the stands in this area, while the TLB was also sourced locally from an emerging enterprise.
- This research report does not cover these 300 middle-income stands, as that project lies outside the scope of the current research.

5.2.5 CHALLENGES ENCOUNTERED ON THE PROJECT

There is a saying that "in engineering no two projects are ever the same". This is true and it was witnessed in Modimolle.

On this project the team members were more skilled than the Extension 7 team. With the team balancing being in place, it was assumed that no major challenges would be encountered but, unfortunately, the following challenges were found:

- There were existing structures on the pipe route in the form of shacks and informal pit latrines.
- The high water table in this area necessitated deep excavation (with the assistance of the TLB) of the sewer pipe line varying between 1.5 m to 4 m deep (Figures 5.4 and 5.5).
- Insufficient funds for the project and the project being funded from two different sources.
- Loss of key personnel (semi-skilled and skilled).
- Non-compliance with certain clauses of the Code of Good Practice (RSA 2002:4) for employment.



Figure 5.4: The TLB assisting with manhole construction



Figure 5.5: Deep excavation at Phagameng Extension 8 using the TLB

5.2.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

With the assistance of the Project Steering Committee, Ward Councillors, Ward Committee members and the co-operation of the local community, it was easy to relocate people quickly without delaying the project.

Even though the pipe route had to pass through an area where there were temporary pit latrines which posed some health risks because the labourers were required to work with human waste, this problem was overcome through teamwork.

5.2.6.1 HIGH WATER TABLE

In relation to the high water-table problem, the labourers were provided with the right personal protection equipment to work in these types of conditions.

The design of the water and sewer reticulation had to be changed slightly to accommodate a sub-surface drainage system, which was also done labour intensively.

5.2.6.2 INSUFFICIENT FUNDING

Despite the fact that additional funding was later approved on this project, the problem remained of funding a project from two different sources that each had its own, slightly different conditions. However, the project team had to adjust to the conditions and all the grant's conditions were adhered to.

5.2.6.3 LOSS OF KEY PERSONNEL

Even though most of the personnel who played a major role in the successful implementation of the Phagameng Extension 7 project were lost to the Municipality, the fact that they now (in 2005) worked for the Council helped a lot in that they remained available to share their expertise.

5.2.6.4 NON-COMPLIANCE WITH CODE OF GOOD PRACTICE

There were contraventions of the clause for the duration of participation and the Unemployment Insurance Fund clauses (RSA 2002:4).

1) On duration of participation, the guideline states: "Special Public Works Programmes seek to provide as many people as possible with the opportunity to participate in the programme" (RSA 2002:3).

   It further says: "No person may be employed for more than 24 months within a 5-year cycle, except in circumstances where no other local labour is available" (RSA 2002:4).

2) Regarding the Unemployment Insurance Fund, despite the fact that the guidelines are clear that: "No Unemployment Insurance Fund contributions will be paid on behalf of or by workers in Special Public Works Programmes" (RSA 2002:4), the Council decided to deduct this contribution and register the local labourers for the Unemployment Insurance Fund. Even though this was not in line with the guidelines, it benefited the local labourers who participated on this programme as labourers whose services were terminated afterwards received money from the Unemployment Insurance Fund.

5.2.7 OVERALL PROJECT OUTPUT

The overall outputs of this project were:

- 42 570 man-days of temporary employment were created.
- 1 592 stands in Phagameng Extension 8 had water and sewer connections in their yard (Erf).
- Training was effective and it drew the attention of the National Ministry of Labour.
- Due to the success of this project and the previous two projects, Modimolle was nominated the winner of the prestigious 2003/2004 Vuna Award.

5.3 MABATLANE (LESEDING EXTENSION 2) LETŠEMA SEWER RETICULATION PROJECT (MARCH 2005 TO FEBRUARY 2006)

The town of Mabatlane (previously known as "Vaalwater") is situated in the Modimolle Local Municipality area about 65 km north of Modimolle town. In 2005 the Council received funds approved through Municipal Infrastructure Grant funding to provide waterborne sewers to this township as, at that time, informal pit latrines were used which did not meet Reconstruction and Development Programme standards.

5.3.1 PROJECT DETAILS

The project details were:

Project name	Leseding Extension 2 Letšema Sewer Project
Approved budget	ZAR6.679 million
Project sponsor	Department of Local Government and Housing under Municipal Infrastructure Grant funding
Client	Modimolle Local Municipality
Consultant	SSA Consulting Engineers
Contractor	Modimolle Local Municipality

5.3.2 BACKGROUND TO THE PROJECT

Leseding Extension 2 is a small township situated 2 km from Mabatlane town. It has a total of 1 316 low-income stands. Water reticulation had already been provided to all the stands, while sewers had been installed only to the first 250 stands with Reconstruction and Development Programme houses. The remaining 1 066 stands were to benefit from this project. Indications from the previous sewer installation contract were that rock could be expected at depths of 500 mm to 1 000 mm which made excavation by hand very difficult. Blasting was also problematic close to existing houses. The excavation was, therefore, expected to be relatively expensive,

hence there had to be sufficient budget to cover this contingency. Despite these challenges, Council maintained its decision of implementing the project labour intensively.

5.3.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES

The project is analysed under the following headings:

5.3.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

Even though the geotechnical conditions of Mabatlane, were not amenable to the use of labour-intensive methods (due to excessive rock within the area), the concept of labour-intensive work was adequately promoted.

A total of 30 local labourers (of whom 20 were male and 10 were female) was appointed.

5.3.3.2 TRAINING OF LOCAL LABOURERS

Training was effective as, during the implementation of this project, the working relationship between the Department of Labour and Modimolle was very good, so both formal and informal training took place. Some of the key personnel, who worked on the Phagameng projects, were seconded to this project as Supervisors in order to transfer skills to Leseding personnel.

5.3.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

This objective was achieved in that 100 % of the labourers who worked on this project were local residents. Even though it was difficult to excavate trenches by hand, the following activities were done labour intensively:

- Removal and reinstatement of fences before and after construction.
- Pipe laying, manhole construction and house connections.
- Setting-up for construction and controlling levels.

- Bedding preparation and subsurface drainage installation.
- Backfilling of trenches.
- Fixing of driveways.
- Site cleaning on completion of the works.

On this project the specifications and documentation took careful consideration of the ground conditions of Leseding. The tender bid was amended to cater for labour-intensive construction and all seven (7) activities mentioned above were strictly labour-intensive. A combination of labour-intensive and capital-intensive operations was used and, by the end of this project, a total of 8 976 man-days of employment were achieved (against the initially planned 6 732 man-days) despite the fact that all excavation on this project was done conventionally due to hard rock.

5.3.3.4 INVOLVEMENT OF LOCAL COMMUNITY

There was great involvement of the local community because most of the temporary pit latrines were on the pipe route – so, in addition to the normal consultation meetings, there were extra meetings to establish the Project Steering Committee in line with Council's policy. Ward Committee members and Ward Councillors participated and were also involved in consultations between the residents and the Council.

5.3.3.5 SUPPORT OF LOCAL BUSINESS

On this project, the project team members complied with the Council's procurement policy by procuring locally: only those items that could not be found locally were sourced from outside (such as the 30 t excavator and the blasting sub-contractor).

5.3.3.6 QUALITY OF THE END PRODUCT

The end product was of a very high standard of workmanship as the appointed project consultant, SSA Consulting Engineers, was also responsible for quality control, site monitoring and supervision.

5.3.3.7 PROJECT OUTPUT

The Leseding project output is summarised in Table 5.5. The cost breakdown for this project is given in Table 5.6

Table 5.5: Leseding project output as at 28 February 2006

Activity	Planned	Achieved
Duration	9 months (March 2005 to November 2005)	12 months (March 2005 to February 2006)
Cost	ZAR6.676 million	ZAR6.84 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scopeof work: Erfs connected with sewers	1 066 stands with waterborne sewers	1 000 stands with waterborne sewers 66 stands were not connected as they were too low for the sewerage to gravitate to the sewer connection point
Money to be retained in Modimolle	70 %	75 %
Employment created	6 732 man-days	8 976 man-days

Table 5.6: Leseding project cost breakdown as at 28 February 2006

Activity description	Amount ZAR	Amount as a %
Professional fees	934 642	13.66 % of the project cost
Training cost	0	Was provided by Department of Labour
Overhead cost	333 801	4.88 % of the total project cost
Total indirect cost	1 268 443	18.54 % of the total project cost
Total construction cost excluding indirect cost	5 571 556	81.46 % of the total project cost
Direct cost to labour paid as wages	659 280	11.83 % of the direct cost

On this project the proportion of budget that went to labour was only 11.83 % due to the excessive rock in the pipe route. Despite this challenge, the lesson learnt was that it is possible to implement a labour-intensive project under any conditions and circumstances.

There was a budget over-run of 2.46 %, which was as a result of the hard rock encountered. However, because the project was implemented internally, no variation order was required even though the amount of hard rock encountered exceeded the anticipated quantity by more than 200 %.

The cost to service a stand in this area was R6 840, which was more than double the Municipal Infrastructure Grant guidelines but, in cases of unforeseen conditions (as in the case of the hard rock encountered on this project), the Municipal Infrastructure Grant required a motivation as the site conditions necessitated this extra cost.

5.3.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

Experience gained from previous projects was applied and contributed to the success of the project in the following areas:

5.3.4.1 TASK DETERMINATION

As excavation did not form part of the labour-intensive scope, new tasks were determined based on the completed projects and international experience, while the task rate was also revised from R35 to R55 per complete task during the 2005/2006 municipal budget.

5.3.4.2 TEAM BALANCING

Since this project involved the use of machine- and labour-intensive methods, a team-balancing exercise for this project is provided in Table 5.7.

The size of the task was determined by using Table A3-1 (Average task output values according to McCutcheon (1983) and Simpson (1980)), which indicate a spreading rate of 12 m^3/day, while the throwing-distance task rates were taken from Table A3-2 (Detailed task rates for excavation (De Veen 1980,1983)).

Table 5.7: Leseding project team balancing as at March 2005

Activity	Work type	Unit	Quantity	Work rate/day	Number of days	Number of workers	Actual number of days	Balancing days	Actual number of workers	Rate/day ZAR	Cost ZAR
1. Site clearance	LIC*	m²	12 870	65	198	5	40	50	4	17.85	3 534.30
2. Fence removal	LIC	m	12 400	100	124	6	21	30	4	17.85	2 213.40
3. Excavation											
3a. Soft	Machine (TLB)	m³	25 483	150	170	4	42	60	3	1 620.00	275 216.40
3b. Hard	Machine (TLB)	m³	15 290	100	153	2	76	90	2	2 520.00	385 308.00
4. Bedding	LIC	m³	1 632	12	136	8	17	20	7	17.85	2 427.60
5. Pipe laying (160 mm diameter)	LIC	m	12 870	100	129	6	21	30	4	23.50	3 024.45
6. Blanket	LIC	m³	3 587	12	299	15	20	30	10	17.85	5 335.66
7. Backfill	LIC	m³	19 113	12	1 593	20	80	90	18	17.85	18 445.00
8. Fence reinstatement	LIC	m	12 400	12	1 033	18	57	80	13	17.85	18 445.00
9. Fixing driveways	LIC	number	8	12	7	4	2	3	2	17.85	119.00
10. Site clearance	LIC	m³	12 400	12	1 033	12	86	100	10	17.85	18 445.00
TOTAL					**4 874**	**100**	**462**	**583**	**77**		**742 499.40**

***LIC = Labour-intensive construction.**
Source: information accumulated by the researcher whilst working on the project.

5.3.4.3 SKILLS TRANSFER

Skills transfer was ensured because:

- Four (4) labourers from the Phagameng projects were seconded to this project to capacitate the labourers in Mabatlane as supervisors.
- The Project Manager was one of the four (4) University of Technology students who had also worked on the Phagameng Extension 8 Project.
- Skills transfer took place and it was effective.

5.3.4.4 PAYMENT OF LOCAL LABOURERS

The same method of paying labourers on a fortnightly basis was adopted, and money was transferred into their bank accounts by electronic funds transfer.

5.3.4.5 RETENTION OF SKILLS

Even though the skills retention was not 100 %, most of the labourers were retained on this project.

5.3.4.6 HEALTH AND SAFETY ISSUES

SSA Consulting Engineers was engaged to oversee safety and ensure that safety regulations were complied with on site at all times. Although there was a combination of machinery and labour on this site, the project was completed without any near-miss incident or accident.

5.3.4.7 TOOLS AND EQUIPMENT

Due to hard rock excavation on this project the following equipment was used:

- 1 x 30 t excavator for trench excavation.
- 1 x TLB 4 x 4 for loading of soft material for bedding and blanketing.
- 3 x 10 m^3 tipper trucks for transporting of material and loading of rocks from site.

For compaction, hand-held compactors and/or Wackers were used, in a similar way to the previous projects.

5.3.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

Local SMMEs were involved as follows:

- The TLB and tipper trucks were hired from local emerging contractors within Mabatlane.
- The 19 mm stone aggregate necessary for sub-soil drainage was purchased from a local quarry, the owner of which is also an emerging contractor.
- The blasting sub-contractor was an emerging contractor even though he was not local to Modimolle, but he was from Limpopo Province.

5.3.5 CHALLENGES ENCOUNTERED ON THE PROJECT

Three challenges were encountered on this project:

- Excessive hard-rock.
- High water table.
- Most of the pipe route passed through existing pit latrines.

5.3.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

The Council endeavoured to assist the team to mitigate challenges faced wherever possible.

5.3.6.1 EXCESSIVE HARD-ROCK

When hard rock was encountered, the Council dealt with the problem by using the services of a blasting sub-contractor and a 30 t excavator to carry out excavation as it was not possible to excavate by hand but, because Council wanted this project implemented labour intensively, some activities were set aside specifically for labour-intensive construction methods.

5.3.6.2 HIGH WATER TABLE

The high water table was addressed by adopting sub-soil drains during the contract to mitigate the problem.

5.3.6.3 PIT LATRINES

The pipe route passed through old pit latrines but this was easy to address as there was a 30 t excavator on site, so all the human waste was removed and the pit latrines were closed immediately.

5.3.7 OVERALL PROJECT OUTPUT

Notable project outputs were:

- The overall employment created on this project was 8 976 man-days as opposed to the planned 6 732 man-days.
- Even though the project exceeded the budget and the planned time frame by 3 (three) months, it produced a good product with regard to quality.
- Due to the success of this project, considering the ground conditions, Council decided to implement the other projects in the Mabatlane area using the same methods of labour-intensive construction.

5.4 MABATLANE EXTENSION 4 LETŠEMA WATER PROJECT (OCTOBER 2005 TO JUNE 2006)

5.4.1 PROJECT DETAILS

The project details were:

Project name	Mabatlane Extension 4 Letšema Water Project
Approved budget	ZAR2.25 million
Project sponsor	Premier's office under the Premier's Emergency Infrastructure Grant
Client	Modimolle Local Municipality
Consultant	CES Consulting Engineers
Contractor	Mayishe Business Enterprises

5.4.2 BACKGROUND TO THE PROJECT

During October 2005 the Province of Limpopo made available a sum of ZAR200 million for the upgrading of water and electricity infrastructure in the Province. The funds were allocated as follows: ZAR100 million was for electricity and the other ZAR100 million was for water projects. These funds were from the Premier's office but were managed by the Department of Local Government and Housing in Limpopo Province together with the Provincial Treasury Department. The funds were once off and all the Local Municipalities in Limpopo Province were encouraged to apply by submitting their business plans. Due to the high level of unemployment in the province at that time, a labour-intensive method of construction was decided on as being the preferred option. The funds were available for a period of six (6) months with an additional period of a further three (3) months for a worst-case scenario. Modimolle Local Municipality also submitted their business plan and it was approved for three (3) water projects, namely:

- Mabatlane Extension 4 Letšema Water Project
- Phagameng Extension 9 Letšema Water Project and
- Leseding Extension 2 Reservoir Project.

The total amount approved for Modimolle Local Municipality under this programme was ZAR8.1 million. On this project Council saw an opportunity to develop SMMEs. The Engineer was appointed to produce the Design and Contract documentation, while construction monitoring and supervision was kept in-house by the Client. A local contractor was appointed to implement this project with the assistance of the Technical Department. Labour-intensive methods of construction were adopted from the design phase and items were properly and clearly marked in the bill of quantities that they should be done labour intensively. Council assisted the appointed Contractor to procure material (for them) and to hire equipment on their behalf on a cession (particularly those items that needed or required large amounts of capital). The previous contract indicated that in Mabatlane hard rock could be encountered at a depth of ~500 mm, while the water table was also high within this area (at ~1000 mm below ground level). Owing to Council's commitment to creating jobs and developing local SMMEs, the decision was taken at Council to implement this project labour intensively.

5.4.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR

5.4.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

The concept of labour-intensive construction methods was adequately promoted, considering the fact that the Project Sponsor, Design Engineer and the Client were committed to this method of construction and non-compliance was not permitted.

The appointed contractor also signed the contract, in which Design, Specification, Drawings and Contract Documentation were all done to accommodate labour-intensive methods of construction.

5.4.3.2 TRAINING OF LOCAL LABOURERS

Even though a local SMME contractor was appointed to implement this project, it was clearly specified that the appointment of unskilled labourers should be 100 % from the local community. The contractor was not allowed to bring any unskilled

labourers from outside Mabatlane. Accredited training such as technical training (trenching, bedding, blanketing, backfill, pipe laying and pipe testing) was provided through the Department of Labour. Other training (such as financial training) was also provided. On-the-job training was provided by keeping the construction monitoring and supervision in-house, because the personnel from Council (officials) were already capacitated to manage labour-intensive projects.

On this project, with regard to training, Council, reached its objective considering the fact that both formal (accredited) and informal (on-the-job) training took place and was well co-ordinated and managed.

5.4.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

Even though the construction part of this project was outsourced (contracted out), the contractor was compelled by the contract to hire all unskilled labourers from the local community of Mabatlane. Indeed, the contractor complied with the contract and 30 local labourers were appointed (of whom 10 were women). The amount of employment created for locals on this project equated to 6 732 man-days, despite the fact that some excavations were done by the TLB due to the ground conditions.

5.4.3.4 INVOLVEMENT OF LOCAL COMMUNITY

The process for the implementation of projects in Modimolle was outlined in Chapter 4. It is well documented in the IDP processes and compels the involvement of the community from the project initiation stage through to project completion and hand-over, which was the case on this project.

5.4.3.5 SUPPORT OF LOCAL BUSINESS

Local business was supported by this contract:

- The appointed contractor was local, while the TLB was hired locally.
- The material was purchased locally through the Council's procurement policy, which emphasised the support of local businesses.

5.4.3.6 QUALITY OF THE END PRODUCT

The quality of the end product was of a very high standard, considering the fact that site supervision and construction monitoring were done in-house by the Department of Technical Services which had to maintain the project after completion and hand-over.

5.4.3.7 PROJECT OUTPUT

The Mabatlane Extension 4 project output is summarised in Table 5.8. The cost breakdown for this project is given in Table 5.9.

Table 5.8: Mabatlane Extension 4 project output as at 30 June 2006

Activity	Planned	Achieved
Duration	6 months (October 2005 to March 2006)	9 months (October 2005 to June 2006)
Cost	ZAR2.25 million	ZAR2.2 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water	503 stands	503 stands
Money to be retained in Modimolle	80 %	80 %
Employment created	4 488 man-days	6 732 man-days

Table 5.9: Mabatlane Extension 4 project cost breakdown as at 30 June 2006

Activity description	Amount ZAR	Amount as a %
Professional fees	315 000	14 % of the project cost
Training cost	0	Was provided by Department of Labour
Overhead cost	188 500	Project was outsourced but Contractor's Preliminary and General cost was 12 %
Total indirect cost	503 500	22.89 % of the total project cost
Total construction cost excluding indirect cost	1 696 500	77.11 % of the total project cost
Direct cost to labour paid as wages	394 020	23.22 % of the direct construction cost
Amount accumulated as loss/profit	Not applicable	This project was implemented by locally based SMMEs

The proportion of funding (23.22 %) that went to labour (in terms of wages) on this project was ZAR394 020, being the amount that was invested in local labourers.

By implementing this project using locally based SMMEs, and labour-intensive methods of construction, Council achieved its goal of developing SMMEs as well as providing temporary employment to local labourers.

5.4.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

Experience gained from previous projects was almost three (3) full years of Modimolle implementing projects labour intensively. This experience contributed to the success of the project in the following areas:

5.4.4.1 TASK DETERMINATION

As the bulk of the excavation was done by the TLB due to site conditions, tasks were determined for bedding preparation, pipe laying, blanketing, backfill, pipe testing and clearing of site on completion.

As the Client retained the responsibility for monitoring the construction, the tasks determined on the previous project were adopted. Labourers were paid for a completed task and they were paid on a fortnightly basis by electronic funds transfer.

5.4.4.2 TEAM BALANCING

A team-balancing exercise (similar to that shown in Table 5.7) was performed on behalf of the contractor, to train her and give her support as to how tasks are balanced in a labour-intensive project, and it was a success.

5.4.4.3 SKILLS TRANSFER

The four (4) Supervisors, together with the University of Technology student, were seconded from the Phagameng projects, for implementation of this project. The four (4) Supervisors were paid by the contractor, while the Technician was paid by the Client (Council) as she performed the duties of a full-time Resident Engineer. Skills transfer also took place, considering the training that formed part of this project through the Department of Labour.

5.4.4.4 PAYMENT OF LOCAL LABOURERS

Labourers were paid on a fortnightly basis, through electronic funds transfer, while the Resident Engineer was paid on a monthly basis.

5.4.4.5 RETENTION OF SKILLS

The skills retained were those of the Resident Engineer because she was later appointed in the Technical Department as a Project Manager.

5.4.4.6 HEALTH AND SAFETY ISSUES

Council was responsible for health and safety issues on this project, hence formal and informal training formed part of this project. The Resident Engineer was responsible for the oversight of all safety issues on this project, while the Contractor also had a safety officer on site.

5.4.4.7 TOOLS AND EQUIPMENT

Due to site conditions, the following equipment was hired locally:

- 1 x TLB to excavate and to load trucks.
- 2 x 10 m^3 tipper trucks for transporting the soft material and removing the hard rocks from site.
- For backfill, compaction and testing density, Wackers, hand-held steel compactors and dynamic cone penetrometers were used.
- 1 x bulldozer for opening the pipe route and streets as the area of Mabatlane Extension 4 was undeveloped before the implementation of this project.

5.4.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

Local SMMEs were involved as follows:

- The TLB and tipper trucks were hired from local emerging contractors within Mabatlane.
- A bulldozer for opening the pipe route and streets was also hired locally, the owner of which is also an emerging contractor.
- On this project a local emerging contractor was appointed to implement the project on behalf of Council labour intensively.

5.4.5 CHALLENGES ENCOUNTERED ON THE PROJECT

Two main challenges were encountered:

- Excessive hard rock.
- The contractor appointed was not conversant with labour-intensive construction methods but, owing to on-the-job training and her willingness to learn, she was trained and she gained skills to implement the project labour intensively.

5.4.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

Where challenges were encountered on the project, the Municipality was most accommodating:

- With regard to the hard rock, a TLB was used for most of the excavation where the hard rock was encountered. To a depth of 1 m, there was soft rock which was easy to break with the TLB.
- With regard to the appointed contractor not being familiar with labour-intensive construction, there was skills transfer to the appointed contractor and, after nine (9) months with her on site, she was trained with regard to labour-intensive construction methods.

5.4.7 OVERALL PROJECT OUTPUT

The overall project output was:

- A total of 6 732 man-days was achieved on this project, while 503 stands were reticulated with water and had a tap on each Erf.
- The project was completed three (3) months later than was originally planned but it was within budget.

5.5 PHAGAMENG EXTENSION 9 LETŠEMA WATER PROJECT (OCTOBER 2005 TO JUNE 2006)

5.5.1 PROJECT DETAILS

The project details were:

Project name	Phagameng Extension 9 Letšema Water Project
Approved budget	R3.9 million
Project sponsor	Premier Emergency Infrastructure Grant
Client	Modimolle Local Municipality
Consultant	CES Consulting Engineers
Contractor	Modimolle Local Municipality

5.5.2 BACKGROUND TO THE PROJECT

Phagameng Extension 9 consists of low-income stands covering 90 ha. This extension came about as a result of pressure on the need for low-income housing as a consequence of the eviction of farm dwellers. Council decided to establish a new extension next to Phagameng Extension 8. There was total of 1 003 low-income stands in this extension. After the township was established, while Council was planning to budget funds to put infrastructure (water) into this extension, the Premier's Emergency Infrastructure Grant was introduced and it came to Council's rescue. Phagameng soil conditions, as previously mentioned, permit the use of labour-intensive construction methods to the fullest. After funds were approved, all the labourers (other than some who were appointed permanently by Council, some by other departments, some by the Private Sector, and a few who had moved) who worked on the Phagameng Extension 8 Project were appointed on this project to implement it.

5.5.3 ANALYSIS OF THE PROJECT IN LINE WITH COUNCIL'S OBJECTIVES AND THE PROJECT SPONSOR

5.5.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

Three (3) main benefits resulted from this project:

- The concept of labour-intensive construction was adequately promoted, Council's resolution was very clear that the successful implementation of the pilot project would ensure that all other projects would follow the same route.
- The team was increased to 150 labourers. All 150 labourers appointed on this project were from Phagameng Township.
- The direct employment approach was still adopted on this project, where the managerial support and financial control were handled in-house by the Municipality.

5.5.3.2 TRAINING OF LOCAL LABOURERS

The following points should be noted regarding the training of local labourers:

- All the labourers who worked on this project benefited from training provided by the Department of Labour.
- The working relationship between the Department of Labour and the Modimolle Local Municipality was very sound at that time, resulting in a visit by the National Department of Labour Minister. The Waterberg District Department of Labour relied a lot on the Modimolle Local Municipality to ensure that they spent their budget wisely, as most municipalities were not using this opportunity to provide training through the Department of Labour's budget.
- Both formal and informal training took place.
- The major focus with regard to training was on supervisory, financial, technical and soft-skill training.
- All local labourers who worked on this project benefited from the training provided.

5.5.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

This project created and achieved:

- A total of 24 948 man-days (against a planned 15 840 man-days) of employment created.
- As this project ran concurrently with the Mabatlane Extension 2 project, this means that across both projects, a total of 33 924 man-days of employment was created between the period October 2005 to June 2006 which was an excellent achievement.

5.5.3.4 INVOLVEMENT OF LOCAL COMMUNITY

There was substantial involvement of the local community because:

- The local community was greatly involved on this project through the Municipality IDP processes and the on-going community meetings during project implementation.
- There was a democratically elected Project Steering Committee in place which ensured that there was community buy-in on this project.
- The community buy-in played a major role on this project towards its success, as there was never a time where the community had a problem or a complaint about this project.

5.5.3.5 SUPPORT OF LOCAL BUSINESS

Local business was supported because:

- All materials and small tools and equipment that were available locally were purchased locally in line with Council's procurement policy.
- This principle of procuring locally ensured that local business was developed and capacitated.

5.5.3.6 QUALITY OF THE END PRODUCT

The quality of the end product at hand-over was high because:

- On this project there was continuity with regard to personnel who had worked on the previous projects in Phagameng, ensuring that the quality was not compromised.
- The same labourers, who started with the pilot project in 2003, were still part of this project.
- The fact that the maintainer of the completed project was also the implementing agent added an advantage with regard to the standard of the end product produced and delivered by the project team.
- On this project, construction, construction monitoring and supervision were kept in-house by the Client, as the consultant's mandate was to do only the design.

5.5.3.7 PROJECT OUTPUT

The Phagameng Extension 9 project output is summarised in Table 5.10. The cost breakdown for this project is given in Table 5.11.

Table 5.10: Phagameng Extension 9 project output as at 30 June 2006

Activity	Planned	Achieved
Duration	6 months (October 2005 to March 2006)	9 months (October 2005 to June 2006)
Cost	ZAR3.9 million	ZAR2.9 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water	1 003 stands	1 003 stands
Money to be retained in Modimolle	80 %	85 %
Employment created	15 840 man-days	24 948 man-days

Table 5.11: Phagameng Extension 9 cost breakdown as at 30 June 2006

Activity description	Amount ZAR	Amount as a %
Professional fees	546 000	14 % of the total project cost
Training cost	0	Was provided by Department of Labour
Overhead cost	195 000	5 % of the total project cost
Total indirect cost	741 000	22.89 % of the project cost
Total construction cost excluding indirect cost	2 159 000	74.45 % of the total project cost
Direct cost to labour paid as wages	1 422 450	65.88 % of the direct construction cost
Amount accumulated as profit	1 000 000	25.64 % of the approved budget

The amount of funding that went to labour in the form of wages – excluding overheads, professional fees and all other indirect costs on this project – was ZAR1.422 million. The total percentage of money that went to labour equates to 65.88 %, which was the best achievement of all projects implemented in Modimolle. (This achievement still stands as at February 2012.)

5.5.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

5.5.4.1 TASK DETERMINATION

The task determined during the pilot project was adopted: the only slight change was the rate per task which was reviewed to R55/task from R35/task.

5.5.4.2 TEAM BALANCING

The team-balancing exercise performed on the previous project was replicated as it proved to be successful and it also worked well on this project.

5.5.4.3 SKILLS TRANSFER

Substantial skills transfer took place:

- Most of the 150 labourers who worked on this project formed part of the previous projects and therefore skills transfer took place.
- There were two (2) University of Technology students who did their in-service training on this project.
- The other University of Technology students who worked on the previous labour-intensive projects also played a major role with regard to skills transfer as they were seconded to this project as Resident Engineer, Project Managers, Site Agent and Contract Managers.

5.5.4.4 PAYMENT OF LOCAL LABOURERS

The system of paying labourers on a fortnightly basis was again adopted and labourers were paid directly into their bank accounts through electronic funds transfer.

5.5.4.5 RETENTION OF SKILLS

Skills retention is essential to maintain a consistent, motivated labour force.

The retention of skills on this project with regard to local labourers was almost 90 % because those who left the programme were either appointed permanently in the Municipality or within the District, with the remainder still being on the programme.

With regard to the University of Technology students who benefited on this programme, in total 12 students received in-service training from the Municipality between January 2003 and December 2006. At least 10 of the 12 students were appointed permanently by Modimolle Local Municipality as Technicians in various departments in Technical Services. These employees left the Municipality only after being appointed elsewhere to a better post or to a promotion post.

5.5.4.6 HEALTH AND SAFETY ISSUES

The appointment of a Resident Engineer and Site Agent from in-house personnel, who were part of the training offered by the Department of Labour, also ensured that compliance with Health and Safety regulations was not compromised.

5.5.4.7 TOOLS AND EQUIPMENT

The only tools used on this project were hand-held compactors, Wackers, dynamic cone penetrometers, jack hammers, breakers and two (2) compressors to assist in areas where hard rock was encountered on the project.

5.5.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

On this project no emerging contractors were involved as the Client kept all the administration of this project in-house and local labourers were appointed as casual labourers to implement the project.

5.5.5 CHALLENGES ENCOUNTERED ON THE PROJECT

Several challenges were encountered on this project:

- Non-compliance with the Special Public Works Programme Code of Good Practice (RSA 2002:4) with regard to South Africa's Unemployment Insurance Fund and
- Non-compliance with the duration of participation on the programme.

5.5.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

The Modimolle Local Municipality implemented two (2) interventions to mitigate the challenges encountered:

- Even though Council took a decision to register all the employees who worked on the Letšema projects with the Unemployment Insurance Fund, their argument was that the guidelines were there for guidance purposes only. Regarding the basic conditions of employment, the

Council's view was that if one does more than the basic or guideline level of implementation then the employer was still complying with the principles of the guidelines.

- The guidelines clearly specified that "No person may be employed for more than two (2) years within a five (5) year cycle except in circumstances where no other Local is available" (RSA 2002:4) Despite the fact that 50 % of Modimolle's township residents were unemployed, the same people worked and benefited for a period of more than four (4) years on this programme. However, the Council's practice of employing the same labourers for extended periods benefited the Technical Department because, with more experienced personnel or labourers on site, productivity and progress were very good.

5.5.7 OVERALL PROJECT OUTPUT

At the end of the municipal financial year 2005/2006, the overall project's output was:

- About 150 local labourers and four (4) local Supervisors who had benefited from the project, bringing the total amount of employment created within a period of nine (9) months to 24 948 man-days.
- 1 003 stands in Phagameng Extension 9 were provided with water in their yards.
- 1 003 beneficiaries received serviced stands with regard to water and roads and storm water at a Reconstruction and Development Programme level of service.

5.6 MODIMOLLE TOWN LETŠEMA WATER PROJECT: REPLACEMENT OF ASBESTOS-CEMENT PIPES WITH UPVC PIPES (JULY 2005 TO MARCH 2007)

5.6.1 PROJECT DETAILS

The project details were:

Project name	Modimolle town Letšema Water Project, Replacement of asbestos-cement pipe with UPVC
Approved budget	ZAR3 million over 3 years at ZAR1 million per annum
Project sponsor	Modimolle Local Municipality
Client	Modimolle Local Municipality
Consultant	N/A (As-built drawings were used to replace existing pipes)
Contractor	Modimolle Local Municipality

On this project local labourers were appointed or transferred from successfully completed Letšema projects.

This project was structured in a way that allowed any surplus labourers from existing Letšema projects to be transferred to this project. At peak this project had appointed 154 local labourers (including local supervisors), with each team having a total of 30 local labourers and one (1) supervisor.

5.6.2 BACKGROUND TO THE PROJECT

The introduction of EPWP, its funding (the Municipal Infrastructure Grant) and its budgeting processes worked to the Council's advantage. This EPWP introduced the Medium-Term Revenue and Expenditure Framework. The Medium-Term Revenue and Expenditure Framework allows municipalities to undertake medium-term budgeting for three (3) years, which was not the case with the old municipal budgeting system, which allowed for only one (1) year budgeting and, if projects were not completed, application was required for funds to be "rolled-over" (the term used to move funding from one financial year to the other). Therefore, with the

Medium-Term Revenue and Expenditure Framework, a project could be budgeted for a minimum of three (3) to a maximum of five (5) years, without having to request roll-over, as long as there are funds allocated to it every financial year.

Through the Modimolle Local Municipality Water Service Development Plan there was a project that was identified for the replacement of existing old asbestos-cement pipes with UPVC pipes. This project came about as a result of asbestos-cement pipes that formed 100 % of water reticulation in and around Modimolle town, having problems due to ageing. These asbestos-cement pipes were laid more than 60 years ago during the time of Nylstroom Town Council.

Frequent pipe bursts that occurred mainly during winter were causing maintenance problems, inconvenience and water interruptions to the people living in and around Modimolle town. Therefore, with the Medium-Term Revenue and Expenditure Framework, Council budgeted for replacement of these old asbestos-cement pipes over a three (3) year period. This project was funded mostly from the savings realised on the other projects (such as Phagameng Extensions 7 and 9 Letšema Projects). Council realised a huge saving on these two (2) projects by implementing them in-house (using a direct employment approach) and using labour-intensive methods of construction. Since they were funded from conditional grants, Council was not allowed to make profit. Therefore, all the savings were required to be declared and to be used on other projects of a similar nature. So this project was implemented with funds from savings and other internal funding from Council.

5.6.3 ANALYSIS OF THIS PROJECT IN LINE WITH COUNCIL'S OBJECTIVES

This project is analysed in accordance with Council objectives under the headings below.

5.6.3.1 USE OF LABOUR-INTENSIVE CONSTRUCTION METHODS

The concept of labour-intensive construction methods was adequately promoted. The fact that asbestos-cement pipes were to be replaced in a developed area where there were other underground services (such as telecommunication cables, electricity

cables, sewer pipes and existing water pipes, for example), mitigated in favour of labour-intensive methods of construction being more favourable than conventional methods in order to minimise damage to existing infrastructure. Although this project started in July 2005, during the period July 2006 to March 2007, a total of 154 local labourers benefited on this project as additional labourers were seconded to this project as and when other labour-intensive construction projects that were running concurrently ended.

Annexure B contains an example of a timesheet for a fortnight in March 2005 before the daily or task rate was revised. From this timesheet it can be seen that Modimolle Local Municipality was committed to implementing projects using labour-intensive methods.

The timesheets were very simple and straight forward, with the first column indicating the name of the employee and the second column containing the identity document number (it was compulsory for everyone working on this programme to have a South African identity document). The third column showed the number of tasks the employee completed within that period; the fourth column indicated the number of tasks completed or days the employee had worked; the fifth column was the pay rate of that employee; the sixth column was the total nett pay for the employee, while the seventh column showed the money deducted (for the Unemployment Insurance Fund) for the work period. The last column contained the vote number (the cost centre number from where the money was paid for wages during the period). The reason it was important to record the number of days worked was for control purposes, because even though workers were paid for tasks completed and the principle of "no work, no pay" was applied, those people who were often absent without a valid reason were disciplined and replaced with more committed employees. All the employees indicated on the time sheet that they came from the local community.

5.6.3.2 TRAINING OF LOCAL LABOURERS

From the example of a timesheet in Annexure C (July/August 2006), it can be noted that the rate for labourers is not consistent. The reason for this was the continual training that was offered through the Department of Labour. Employees or labourers

who did well at training were promoted to: Gang Leaders, Pipe Layers or Artisans, Project Administrators and Salary Clerks. The salaries of the Project Managers, Site Agents and Resident Engineers are not reflected on these timesheets but are included in the proportion of costs that went to labour. The fact that people were promoted from one project to the next indicates how effective training was on this project.

5.6.3.3 CREATION OF MAXIMUM EMPLOYMENT FOR LOCAL RESIDENTS

This project alone created a total of 37 268 man-days of employment, focusing only on local labourers from the community. All (100 %) the unskilled labourers appointed came from local communities around Modimolle.

5.6.3.4 INVOLVEMENT OF LOCAL COMMUNITY

This project was in an existing developed area and a business node so it was anticipated that disruption of the water supply might negatively affect the community and the business community. To minimise this impact Council took extra measures to involve the community through public meetings and discussion forums. During this project the community was affected throughout the project's life cycle as the project interfered with their daily activities and some of their walkways and driveways were also affected.

5.6.3.5 SUPPORT OF LOCAL BUSINESS

Local business was supported because material was purchased locally wherever possible as per Council policy.

5.6.3.6 QUALITY OF THE END PRODUCT

With about four (4) years of using the "force account" system, the quality of workmanship on this project was rated as excellent. Quality assessment was done by Local Government project managers.

5.6.3.7 PROJECT OUTPUT

The Modimolle Town Letšema Water project output is summarised in Table 5.12. The cost breakdown for this project is given in Table 5.13.

Table 5.12: Modimolle Town Letšema water project output as at 31 March 2007

Activity	Planned	Achieved
Duration	36 months (July 2005 to June 2008)	21 months (July 2005 to March 2007)
Cost	ZAR3 million	ZAR3 million
Quality of end product	Very high standard of workmanship	Very high standard of workmanship
Scope of work: Erfs connected with water	3 227 stands	3 227 stands
Money to be retained in Modimolle	80 %	85 %
Employment created	35 840 man-days	37 268 man-days

Table 5.13: Modimolle Town Letšema water project cost breakdown as at 31 March 2007

Activity description	Amount ZAR	Amount as a %
Professional fees	0	As-built drawings were used
Training cost	0	Was provided by Department of Labour
Overhead cost	150 000	5 % of the total project cost
Total indirect cost	150 000	22.89 % of the project cost
Total construction cost excluding indirect cost	2 850 000	95% of the total project cost
Direct cost to labour paid as wages	2 049 740	71.92 % of the direct construction cost
Amount accumulated as profit	0	0% of the approved budget

The proportion of funding (71.92 %) that went to labour on this project was ZAR2.049 million, which is the amount invested in local labourers in the form of wages. It should be noted, however, that the 71.92 % is not a true reflection of the direct construction cost as the actual cost was considerably reduced as it was not necessary to purchase the full amount of material required as surplus pipes and materials from previous projects were transferred to, and used on, this project.

5.6.4 THE EXTENT TO WHICH PREVIOUS PROJECTS CONTRIBUTED TO THE SUCCESS OF THE PROJECT

5.6.4.1 TASK DETERMINATION

The task determined at the pilot stage was adopted throughout all the projects and, on this project, there was no difference except that the rate for labourers was revised from R35/per task to R55/task with effect from 1 July 2005.

5.6.4.2 TEAM BALANCING

The previous projects' team-balancing exercise, which proved to be effective and efficient, was adopted and implemented on this project.

5.6.4.3 SKILLS TRANSFER

From the timesheets in Annexures B and C, differences in daily rates indicate the different roles each labourer was undertaking. Those with daily rates slightly higher than others were promoted from the local labourers after they had undergone training and shown an improvement and competence. The skills transfer was done successfully both through on-the-job training and thorough formal training that was offered through the Department of Labour.

5.6.4.4 PAYMENT OF LOCAL LABOURERS

Labourers were paid on a fortnightly basis, and each labourer was given his/her task completed, number of days worked and the nett pay. The deductions made from their wages were also shown. This information was printed and made available on Tuesday prior to being paid on Friday. Even though the labourers were paid on a

fortnightly basis, their fortnight was structured such that they worked one (1) week in advance (meaning that when the project commenced, they worked three (3) weeks before being paid for the first fortnight period. Thus, in effect there was a one (1) week retention held for each worker. At the end of the contract the retention money was paid to the workers).

5.6.4.5 RETENTION OF SKILLS

The allowance that was made on this project (anent promotion and training from within) played a major role with regard to retention of personnel. More than 90 % of labourers were retained on this project.

5.6.4.6 HEALTH AND SAFETY ISSUES

Training played a major role in ensuring that none of the project labourers was injured on duty. This project was also completed injury-free.

5.6.4.7 TOOLS AND EQUIPMENT

No sophisticated tools were used on this project other than a walking roller, a Wacker, hand-held steel compactors and dynamic cone penetrometers.

5.6.4.8 INVOLVEMENT AND CAPACITATION OF EMERGING CONTRACTORS

On this project the involvement of emerging local contractors was minimal as they were involved only with detecting underground services (electricity cables and telecommunication cables) before hand excavation for pipe trenches could take place, where "as-built" drawings do not exist.

5.6.5 CHALLENGES ENCOUNTERED ON THE PROJECT

The challenges encountered on this project were minor and more of an irritation than a major inconvenience. There were:

- Minor water interruptions which were encountered when switching to the new water lines.

- Minor damage to existing infrastructure, especially electricity cables.
- Damage to residence walkways and driveways, which were later fixed.

5.6.6 INTERVENTIONS BY THE MUNICIPALITY TO MITIGATE THE CHALLENGES

The municipality assisted as far as possible to minimise disruptions as follows:

5.6.6.1 WATER INTERRUPTIONS

When switching to the new pipeline, notice was given seven (7) days in advance before the switch over to the new pipeline to minimise major interruptions. Switch overs were done over the weekend when most of the businesses were closed.

5.6.6.2 DAMAGE TO ELECTRICITY RETICULATION

In Modimolle the Electricity Section and Water and Sewer Section were within one (1) department, making it easy for the community to reach the correct section responsible when problems were encountered. These two (2) sections also worked together so that if damage was caused by a work team from one (1) section to another section's property, that damage was reported and attended to immediately.

5.6.6.3 DAMAGE TO RESIDENCE WALKWAYS AND DRIVEWAYS

Through training that was provided on the programme, fixing of driveways and walkways was done internally by the labourers that worked on this project. This was evidence that the skills they had acquired were adequate because they never received any comebacks or complaints after fixing and maintaining the damaged infrastructure.

5.6.7 OVERALL PROJECT OUTPUT

The overall output from the project was:

- By the end of the of March 2007, about 150 local labourers and four (4) local Supervisors benefited on the project, bringing the total amount

of employment created within a period of 21 months to 37 268 man-days.

- A total of 3 227 stands in Modimolle town were provided with uninterrupted water in their yards.
- The proportion of funding that went to labour on this project was in the form of wages, totalling ZAR2.049 million.
- The 71.92 % direct cost on the project that was paid to wages (even if it was not a true reflection of the direct construction cost because it was not necessary to purchase all the materials as surplus pipes, fittings and other materials from previous projects were transferred to this project) was most encouraging for future labour-intensive projects or programmes using a "force account" system.
- The success of this project was a result of proper consultation with the local and affected community members and the long-term "force account" system that Modimolle adopted.

The next chapter contains a discussion of the shortcomings and the factors that contributed to the success of the Modimolle Local Municipality labour-intensive projects.

Table 5.14: Compliance with Council objectives: indicators of success

Project name	Use of labour-intensive construction methods	Training of local labourers	Creation of employment for local residents	Local community involvement	Support of local business	Task determin-ation	Skills transfer	Payment of local labourers	Retention of skills	Tools and equipment
Phagameng Extension 5 & 6 water project	*Met	Met	Met	***Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**
Phagameng Extension 7 water & sewer project	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**
Phagameng Extension 8 water & sewer project	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	Met
Phagameng Extension 9 water project	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**
Mabatlane Extension 4 water project	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**
Leseding sewer project	Met	**Exceeded**	Met	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	Met
Modimolle Town Letšema Water Project	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**	Met	**Exceeded**	**Exceeded**	**Exceeded**	**Exceeded**

***Exceeded = 75 to 100 %** **Met = 50 to 74 %** **Not met = 0 to 49 %**

CHAPTER 6:
ANALYSIS OF THE MODIMOLLE PROJECTS

Chapter 4 documented, evaluated and analysed the pilot project that took place in Modimolle prior to the implementation of the labour-intensive construction projects. Chapter 5 documented, evaluated and analysed the eight (8) Modimolle labour-intensive projects based on international and national best practices. This chapter details the successes and shortcomings from both the Modimolle pilot project and the eight (8) labour-intensive projects.

6.1 FACTORS THAT CONTRIBUTED TO THE SUCCESS OF THE MODIMOLLE LABOUR-INTENSIVE PROJECTS

Many factors contributed to the success of the Modimolle labour-intensive projects:

- Training played a major role towards the success of the Modimolle labour-intensive projects.
- Long-term political support and political will also played a substantial role towards the success of the projects.
- The introduction of EPWP and its funding (the Municipal Infrastructure Grant) also contributed towards the projects' successes.
- The concept of labour-intensive construction was adequately promoted prior to, and during, the implementation of the projects.
- All parties involved were properly consulted about, and supported, the method of construction.
- Experts, with extensive national and international experience in labour-intensive construction, were consulted.
- Documented literature – international and local (South African context) – on labour-intensive construction was studied thoroughly and the

information gleaned was applied to the Modimolle labour-intensive projects.

- Supervision was adequate, which was due to effective training for Supervisors through both formal and informal (on-the-job) training.
- The training budget allocated by the Department of Labour to technical training and Supervision training was sufficient as there was not a time that labourers could not be trained due to budgetary constraints.
- There was long-term support from the Department of Labour, the Department of Local Government and Housing and the Department of Public Works (provincial office).
- There was long-term financial commitment and support by the Council of Modimolle.
- The effort and commitment the Modimolle Town Council made to achieve community participation and acceptance of a labour-intensive method of construction through its IDP processes and other Sector Plans (Water Service Development Plan, Storm Water, Road Master Plan, and Electricity Master Plan) was enormous and contributed positively to the outcome of the projects. The annual budget discussions also contributed to the projects' successes.
- The availability and willingness of unskilled labour to work as labourers on the programme.
- Quality control was adequate and those responsible to monitor quality were committed as all tests required by the South African Bureau of Standards' codes or the South African National Standards were complied with.
- The fact that the daily task and task rate were kept low ensured that more labourers benefited from the project and projects were completed within the available budget constraints.
- Productivity improved drastically over time, as the longer the labourers were involved on these projects and attended training, the more productive they became.
- The organisational structure adopted and used by the Modimolle Local Municipality to co-ordinate the programme was effective because there was commitment and support from the Technical Department

directorate, which was the responsible department tasked with ensuring the success of the projects.

- The overall productivity of labour was generally higher than that achieved in international programmes, considering the number of tasks that were completed daily on these projects. This increased output was in itself an incentive to work efficiently and reliably as the labourers benefited from the additional wages earned.
- Health and safety issues were not neglected and this is attributed to the effective on-going training that was provided through the Department of Labour.
- The awards that were received by the Modimolle Local Municipality also contributed positively towards their long-term commitment to this programme.
- Between November 2002 and December 2006, Modimolle Local Municipality received the following awards: the 2003/2004 Vuna Award for the best Municipality in Limpopo (with a prize of R750 000). In 2005/2006 they were the provincial winners of the Govan Mbeki Award and, at national level, they achieved third position out of 262 local municipalities.

The Govan Mbeki Award, was the award introduced by the then Minister of Housing, Ms Lindiwe Sisulu, during the 2005/2006 financial year. For this award the Municipality competed in the following areas:

- Best innovations in implementation of projects.
- Best in project implementation and management, budget spending in line with the Integrated Development Plans submitted to provincial and national government.
- Best in infrastructure development with regard to provision of basic services (water, sewer, roads and storm water at Reconstruction and Development Programme level of service).
- Best in employment creation, training and skills transfer for local residents.
- Best with regard to readiness to provide serviced stands for Reconstruction and Development Programme houses.
- Best in Local Economic Development and Financial Viability.

6.2 ACHIEVEMENTS OF MODIMOLLE LABOUR-INTENSIVE PROJECTS AS AT MARCH 2007

Table 6.1 depicts the man-days of employment generated during the programme between 2002 to 2007. The following were achieved:

- Modimolle was successful in replicating the Botswana programme. The greatest achievement was that a total of 65.88 % went to labour as wages and salaries, which is slightly higher than Botswana's 65 %.
- A total of 4 330 stands received water in their yard (Erf connections), while a total of 19 485 households benefited by receiving water.
- A total of 33 % of stands received a waterborne sewer connection in their individual stands, while a total of 15 255 households benefited by receiving decent and proper sanitation.
- A total of 12 students (Technicians) from the Universities of Technology, benefited from the programme, graduated and received their qualifications.
- At peak operation, water and sewer projects managed to employ a total of 154 local labourers at a time.
- A total of 154 022 man-days of employment was generated during the programme between 2002 and 2007 on only water and sewer projects. Considering that even trenching on electricity projects and roads and stormwater projects was implemented labour intensively, this figure would be enormous if labour-intensive methods of construction were implemented nationally.
- Over a period of four (4) years an amount of ZAR7.5 million went to local labourers as wages, which represents 29.25 % of the total project cost. The figure would have been higher had hard rock conditions not been encountered on two (2) of the projects which necessitated the use of machinery to overcome the problems.
- A total of 8 577 households received access to basic water and sanitation in their yards.
- The quality of the end product achieved using a "force account" system in Modimolle was high when compared to similar equipment-intensive projects carried out before.

- Training at different levels played a major role in the success of the Modimolle projects.
- Council received three (3) awards: two (2) at provincial level and one (1) at national level.

6.2.1 POSITIVE INTERVIEWS FROM VARIOUS ROLE PLAYERS

Below are positive comments made to the researcher by 13 individuals in the construction industry to whom he spoke:

- **Interviewee 1 (a former – now deceased – Municipal Manager of Modimolle) at the Govan Mbeki Award:**

  "Modimolle Letšema Projects is one of the success programmes [sic] this municipality ever had in its history, which is why we have been winning awards year in year out."

- **Interviewee 2 (a former Mayor of Modimolle during the Vuna Award Presentation):**

  "With the Letšema Water and Sewer Projects, our Municipality has indeed been proactive in its approach to the challenges [poverty and inequality] faced by our new developing and emerging democracy."

- **Interviewee 3 (the former Chief Financial Officer of Modimolle Local Municipality):**

  "Letšema Water and Sewer Projects is a good initiative to create employment for unskilled labourers in Modimolle... it has just won the Municipality the Vuna Awards and through hard work and team work we can achieve even more."

- **Interviewee 4 (the former Director Corporate Services Modimolle Local Municipality and currently (2012) Senior Manager at SALGA Limpopo who suggested the term "Letšema" at Management and Council, which was adopted as an extension to all labour-intensive projects in Modimolle):**

  "Letšema projects was [sic] a trend setter, the best model ever in Limpopo that changed people's lives through income redistribution through wages and purchasing of all materials and equipment from local suppliers, skills levels were too low before the programme but through training that was provided people left the programme well equipped and skilful."

- **Interviewee 5 (former Chief Whip and Councillor at Modimolle Local Municipality):**

  "With Letšema Projects we like to thank management for coming up with this great idea... it has created jobs for people in various wards in the Municipality and we will like to make commitment [sic] that as long as we are still in charge we will support it."

- **Interviewee 6 (former Speaker and Councillor at Modimolle Local Municipality):**

  "Letšema Projects has 'put us on the map', we are proud as Councillors and we walk tall because of its success. At the beginning I was not sure that it will work, but I will like to thank you officials [sic] for all the hard work and dedication you have put together... in particular the Municipal Manager as the head of administration."

- **Interviewee 7 (a Director and Shareholder of a Consulting Engineering firm):**

  "In the consultancy work he is providing to Limpopo Province and the municipalities in the province, the Modimolle projects were unique and were well structured and well implemented."

- **Interviewee 8 (Project Manager on the Modimolle programme recruited from the Gundo Lashu programme):**

  "Labour-intensive projects are considered poverty alleviation projects in that they target mainly rural areas. They also provide long-term road maintenance. Lesotho Department of Rural Roads [equivalent to Department of Public Works in South Africa], is using strategies of labour-intensive projects from construction and up to maintenance of their roads.

  Modimolle Local Municipality labour-intensive projects were targeting people residing in low-cost housing of which the majority had no jobs. These were projects that provided a sustainable income over a period of years.

  The economic livelihoods of the people involved in the projects were remarkable, most would work on targets like painting their houses, buying furniture, minor house improvements like paving, putting ceramic tiles etc. The improvement was remarkable.

  The skills transfers in the projects were very much remarkable [sic] as most labour-intensive beneficiaries ended up working in the Municipality. Most Municipalities have Local Economic Development programmes where use of local suppliers and contractors was encouraged... as Modimolle Local Municipality was small and the grants received from the Municipal

Infrastructure Grant were limited, most construction-based projects were labour-intensive based and the Municipality was the contractor, huge savings were done [sic] on these projects in terms of time, resources and red tape involving tendering processes.

It would be ideal if most municipalities would follow similar routes as the ageing infrastructure is in need of maintenance... instead of procuring services of contractors for maintenance purposes, labour-intensive projects could be implemented for roads and storm water, road marking, grass cutting, replacing asbestos-cement pipes, paving, painting etc."

- **Interviewee 9 (a student from the Vaal University of Technology, who did her in-service (practical training) at Modimolle from July 2003 to June 2005 to meet the University's requirements for her Civil Engineering Diploma).** This interviewee worked on the Phagameng Extension 7 project on the main outfall sewer portion and also on the Phagameng Extension 8 water and sewer project as a Site Agent:

"I believe that it was a good impression [sic] to get the local labourers to be involved in the projects than getting contractors. It saved time and money because we were able to finish the project before the estimated completion date. It also created opportunities for the local labourers because they were able to get skills which benefited and enabled them to easily get other jobs in future."

- **Interviewee 10 (the owner of a materials supplier in Modimolle):**

"I think it is a good thing that Council is doing the projects themselves, apart from us benefiting as the Local Businesses, the Local Community is also benefiting and this is good for the local economy."

- **Interviewee 11 (the manager of a materials supplier in Modimolle):**

"I think [it] is a good thing that Council is doing the project in-house, this create[s] job opportunities for local[s] and reduce[s] crime... They should do more of this [sic] type of projects."

- **Interviewee 12 (a general worker at Letšema Projects from March 2003 to March 2007):**

  "with Letšema our councillors have done a good thing and I am going to vote as long as our councillors when we vote for them don't only think of themselves but for us the people who voted them [sic]. I also want to thank you Mr Hlabela for bringing Letšema to Nylstroom, we (workers) call you 'Letšema Manager'."

- **Interviewee 13 (a supervisor of Letšema):**

  "I am 49 years old and before Letšema I was struggling to take care of my family but currently I am working and even my kids are like other kids at school. I thank our Municipality for giving us such an opportunity and hope and pray that Letšema must not come to an end."

The achievements highlighted above demonstrate the practical implementation of a "force account" system (direct employment by employer) to execute projects labour intensively, with the major focus being on building capacity in-house, while creating employment for local residents.

6.3 EXTENT TO WHICH COUNCIL'S OBJECTIVES WERE MET

The Modimolle projects may be considered successful because:

- The objective with regard to alleviating unemployment by implementing projects using labour-intensive methods of construction was achieved.
- Labour-intensive methods of construction were effective, efficient and well promoted and therefore this objective was met.
- Training of local labourers that ensured skills transfer through on-the-job training was achieved by training the trainer.
- Extensive training (both formal and informal) which was sponsored by the Department of Labour at all levels assisted Council to achieve its objective.
- The fact that a total of 154 022 man-days of employment was achieved on the programme, focusing on water, sewer (excluding electricity,

roads and storm water), indicates the success with regard to local employment creation.

- The proportion of expenditure that went to labour increased as the team worked together for a long period, with the greatest achievement of 65.88% being recorded. This achievement meant that Council had achieved its objectives.
- The involvement of the local community through Council's IDP, at all stages of the projects (project life cycle) was achieved.
- The fact that all the equipment, material or services that were available locally were sourced locally indicates the success of Council meeting its objective with regard to support of local businesses.
- Quality of the end product was very high in all the completed projects implemented labour intensively, indicating the extent to which this objective was met.

These successes are summarised in Table 6.1.

Table 6.1: Modimolle: comparison of all completed water and sewer projects

Project name	Planned duration (months)	Actual duration (months)	Planned budget (ZAR) (million)	Actual expenditure (ZAR) (million)	Number of households planned to benefit (stands)	Number of households actually benefited (stands)	Quality of end product	Number of jobs created (man-days)	Money that went to labour (%)	Amount paid as wages per project (ZAR)
Phagameng Extension 5 & 6 water project	8	5	1	0.56	520	520	High	1 848	13.64	68 200
Phagameng Extension 7 water & sewer project	12	12	6.84	5.64	755	732	High	31 680	28.58	1 201 200
Phagameng Extension 8 water & sewer project	12	15	3.74	4.74	1 592	1 592	High	42 570	42.61	1 716 750
Phagameng Extension 9 water project	6	9	3.90	2.9	1 003	1 003	High	24 948	65.88	1 422 450
Mabatlane Extension 4 water project*	6	9	2.25	2.2	503	503	High	6 732	23.22	394 020
Leseding sewer project*	9	12	6.68	6.84	1 066	1 000	High	8 976	11.83	659 280
Modimolle Town Letšema Water Project	36	21	3	3	3 227	3 227	High	37 268	**71.92	2 049 740
Total	**77**	**83**	**27.41**	**25.68**	**8 666**	**8 577**	**High**	**154 022**	**29.25**	**7 511 640**

*Hard rock conditions were encountered on these projects, necessitating the use of machinery to overcome the problems.
**This figure is not a true reflection of the situation as the actual direct construction cost was considerably reduced as it was not necessary to purchase the full amount of material required as surplus pipes and materials from previous projects were used on this project.
Source: Summary of researcher's project notes.

6.4 SHORTCOMINGS OF THE MODIMOLLE PROJECTS

There were several shortcomings in the Modimolle projects:

- The pilot project was too short: experts and experience (Gertzen 1999; McCutcheon 1993; Mthombeni 1996) indicate that a minimum of one (1) year is required for a pilot project at Municipal level. This was evident when, on average, one labourer was able to complete a minimum of three (3) tasks per day and is indicative of failure to properly determine or set tasks, which were a "fair day's *wage* for a fair day's *task*".
- The first 40 labourers' contracts were supposed to be terminated at the beginning of the Phagameng Extension 8 project because the labourers had already worked for 15 months on the programme and the Special Public Works Programme guidelines (RSA 2002) do not permit labourers to work more than 24 months in a five (5) year period. Initially the Phagameng Extension 8 project was estimated to be implemented over 12 months. So, by renewing their contracts, the labourers were already guaranteed that they were going to exceed the maximum time allocated by three (3) months at the end of the Phagameng Extension 8 project. The worst case was that some of the labourers who had worked on the pilot project, worked throughout the entire programme, which brought their total duration of employment to more than 48 months continuously. This indicates a shortcoming.
- Non-compliance with regard to Special Public Works Programme guidelines (RSA 2002) indicates that although the Modimolle Town Council achieved successful implementation of their labour-intensive programme, they were reluctant to terminate labourers' contracts after a period of two (2) years – hence there were labourers who had worked four (4) years without a break (the only break these labourers received was during the South African Construction Industry December/January shutdown).
- Even though team balancing was performed before the start of the pilot project and the programme, it was not effective as, after the successful implementation of the first project, no further adjustments were made to the composition of the team. This should not necessarily be seen as an inadequacy, given that the daily rate on which the task was set was below the minimum wage prescribed by Government.

- While focus was put on the creation of jobs (by using a "force account" system) and training of local labourers, little was done to promote SMMEs, despite this being a priority within Council's IDP and budget.

6.4.1 NEGATIVE INTERVIEWS FROM VARIOUS ROLE PLAYERS

Below are comments made to the researcher by four (4) individuals in the construction industry to whom he spoke:

- **Interviewee 14 (an owner of an emerging local contractor):**

  "I think it is not fair how the municipality is currently running projects... we are being denied the opportunity of contracting in our own municipality as they are implementing the jobs in-house. I think the correct way should be that the municipality should contract the work out and only do supervisions [sic]."

- **Interviewee 15) (a manager for expenditure at Modimolle Local Municipality):**

  "Letšema project is creating more work for us as Finance Department... the projects must be contracted out and Council should appoint competent contractors to deliver infrastructure. This will save us time of paying wages every fortnight, which become [sic] even more hectic if the fortnight for wages coincides with the payment of permanent Council staff."

- **Interviewee 16 (a salary clerk in Modimolle Local Municipality):**

  "This Letšema thing is making extra work for us [Finance Department] and you management don't even bothered [sic] to pay us additional money [for] the extra effort... I think it should be stopped and the work be contracted out."

- **Interviewee 17 (an emerging contractor in Modimolle Local Municipality):**

  "You [Modimolle] cannot be a referee and a player at the same time; you [Modimolle] should contract all these works out that you are currently doing and remain the Client and leave contract work to contractors."

Having analysed the Modimolle projects and discussed their successes and shortcomings, the conclusions and recommendations of the research are presented in Chapter 7.

CHAPTER 7:
CONCLUSIONS AND RECOMMENDATIONS

Chapter 1 (the Introduction) of this research report has provided a background, the problem statement, a definition of labour-intensive construction, the scope of study, the methodology, objectives and purpose of the research project, and the limitations of the study.

Chapter 2 provided a literature review from a regional perspective (Malaŵi, Lesotho, Ghana, Kenya and Botswana) on labour-intensive methods of construction. Chapter 3 provided a similar review from a South African perspective (the Strategic Oil Fund, the Community-based Public Works Programme 1994 to 1996, and the Expanded Public Works Programme Phase 1 April 2004 to March 2009).

In Chapter 4 the Modimolle Local Municipality pilot project was documented and analysed.

The information gathered during the pilot (water) project (Chapter 4) was implemented in Modimolle Local Municipality's labour-intensive five (5) water projects and three (3) sewer projects as detailed in Chapter 5. These eight (8) projects were documented and analysed in Chapter 5.

Chapter 6 documented the shortcomings of the Modimolle Local Municipality's labour-intensive projects and all factors that contributed to the success of these projects.

This final chapter of the research report draws conclusions based on the successes of the pilot project and all the evaluated Modimolle Local Municipality labour-intensive projects. Lessons learnt, suggestions and recommendations for future projects of a similar nature based on the Modimolle Local Municipality experiences are also documented.

7.1 CONCLUSIONS

A number of conclusions was reached after analysing the findings from the Modimolle pilot project and the eight (8) labour-intensive projects:

- The time allocated for the pilot project, was much shorter than that normally recommended by experts, namely, a minimum of one (1) year for a municipal project.
- Training of supervisors and/or gang leaders played a major role in the success of the Modimolle Local Municipality projects, while the training of unskilled labourers on various technical aspects increased productivity.
- The concept of labour-intensive construction was adequately promoted prior to, and during, implementation of the projects and consensus was reached by all stakeholders with regard to the method of construction.
- The IDP processes ensured that community participation prior to, and during, construction was fully achieved. Community participation is a formal procedure that is documented and guides the processes of implementing the projects, in Modimolle.
- During construction, the increase in productivity resulted mainly from:
    - Effective training of Supervisors and labourers.
    - Payment of labourers on time (every two weeks).
    - Timeous delivery of material and payment of all material suppliers on time.
    - Strict application of the “no work, no pay” principle.
    - Absenteeism was very low due to strict control measures which were in place and the discipline on site.
    - The parties involved (including the residents in the Townships) encouraged the labourers because they were consulted on the projects prior to their implementation.
    - The good morale among the labourers as they were able to exceed the single task set per day and thus earned higher wages for increased production.

- Effective health and safety training resulted in few injuries or near-miss incidents occurring on these projects.
- Long-term political support played a major role towards the success of these projects.
- The availability of local labour and their willingness to work as unskilled labourers also played an important role in the success of these projects.
- The project was run by the Municipality on a direct employment approach ("force account" system), creating more job opportunities than when projects are outsourced to emerging contractors.
- The Council objectives were very clear and specific and they did not want the "business as usual" scenario described by McCutcheon (1992) because that would have stifled the programme.
- The time allocated for the programme was sufficient even though the practice of non-compliance with the Special Public Works Programme guidelines should be condemned.
- Long-term financial support by various funding agencies also played a major role towards the success of the programme.
- The introduction by the national Government of awards (such as the Vuna and Govan Mbeki awards) was a motivating factor for Council, because the more awards they won, the more awards they competed for.
- Lack of rotation of local labourers after two (2) years of continual employment benefited the Council negatively, because skills transfer and poverty were alleviated for fewer people than initially intended.
- The fact that 114 320 man-days were created on only the water and sewer projects over a period of four (4) years, indicates that labour-intensive construction methods, when used productively, can alleviate poverty and unemployment in South Africa.
- Overall there was a great improvement in production over time, because extensive training took place on this programme.

It can be concluded that labour-intensive construction methods can create a significant number of jobs in water and sewer infrastructure projects using a "force account" system without compromising the project cost, quality and time. This is

only on condition that all parties involved are fully committed to the objectives of the programme; the programme must commence with pilot projects and extensive training at all levels (in particular at supervisory level), and if a long-term perspective is followed.

7.2 LESSONS LEARNT

Several lessons were learnt from the projects:

- The time allowed for the pilot project was short and this did not work in favour of Council because the final task set was far less than the international standard and experiences indicated.
- Technical research and development was carried out. However, too little time was allocated to identify the physical work to be carried out so that aspect was not handled well, with the result that too low a daily task target was agreed upon throughout the implementation of all projects.
- The fact that the wage rate was kept low, below the principal wage rate, assisted to ensure that the project budgets were not overrun, despite the low task targets.
- Training was effective at all levels and the long-term financial support by the Department of Labour contributed positively toward the success of this programme.
- Experts (such as Emeritus Professor McCutcheon) with extensive experience in labour-intensive construction were consulted – hence the programme was a success.
- Quality control was not neglected, field tests were carried out – hence the programme resulted in a product of high-quality standard.
- The overall productivity of labour was generally higher than those predicted by McCutcheon (1983), Simpson (1980) and de Veen (1980, 1983). It was also much higher than those achieved in established programmes internationally.
- The projects run by the Municipality were generally of higher quality standard than those outsourced to contractors.

- The direct employment approach (client-based) proved to be the most successful approach in reaching the goal of employing as high a percentage of labourers as possible.
- The effort to achieve full community participation was not underestimated or undermined throughout the life-cycle stages of the projects (at identification, conceptualisation, implementation and close-out). Thus, in all completed projects, there was support from the local community.
- The fact that all water and sewer projects were implemented using labour-intensive construction methods between November 2002 and March 2007 indicates the Council's success, willingness and commitment to reduce unemployment.
- Projects were generally properly managed as a result of good planning, training and institutional development that took place prior to implementation.

7.3 RECOMMENDATIONS

The long-term nature of the programme allowed for improvement in labour-intensive construction methods and long-term financial support. It is recommended that enough time be allowed for adequate research and development (of a pilot project) at the beginning of a programme.

- Training was adequate, the success of the Modimolle projects and other successful international programmes was as a result of training at all levels. It is recommended that to replicate a programme of this type training at all levels must be given priority.
- The establishment of a Training College or Centre in South Africa should be a priority as they have contributed towards the success of programmes in Kenya and Botswana and elsewhere in sub-Saharan Africa.
- Long-term political support is crucial for any programme success, and it is therefore recommended that political support be obtained in order to implement a programme of this type successfully.

- Community participation played a major role in the success of the Modimolle projects and it is recommended that the community be involved at all stages of the programmes and projects.
- Attention needs to be paid to the time allocated to the pilot project especially considering the fact that task determinations are done at this stage. To avoid failure in programmes and projects of this nature, a minimum of one (1) year should be considered or allocated for a municipal pilot project as per experts' recommendations.
- Institutional development played a major role in the success of the Modimolle Local Municipality projects. It is therefore recommended that any labour-intensive programmes or projects should focus on it.
- It is recommended that quality control and training be adequately monitored and budgeted for, whether the projects are implemented labour intensively or capital intensively, because the success of every project is measured on the quality of the final product.
- Health and safety issues have become one of the most important issues in construction since the 1990s and it is recommended that emphasis and focus be put on this.
- The direct employment approach does not only benefit the local community but it also benefits the client or employer by developing skills in-house and effecting cost savings, so it is recommended.
- It is recommended that experts, with extensive international experience in labour-intensive construction, be consulted when planning or considering implementing programmes of this nature as was the case in Modimolle.
- A great deal of research has been documented and there are many lessons to be learnt from similar programmes throughout the world. Countries with huge unemployment problems need to research and replicate effective labour-intensive construction methods.
- In Modimolle Local Municipality the wage levels were set below the minimum to attract the poorest of the poor, which was adopted from the successful programmes elsewhere in Africa. However, although it is recommended that wages be kept low, they should not be too low in order to attract the targeted group.

- The successes achieved in the Modimolle projects are neither new nor unique. All the successful programmes implemented elsewhere in sub-Saharan Africa followed the same route. For any country faced with unemployment and poverty it is recommended that they adopt carefully thought out, labour-intensive construction methods.
- The effort required to achieve full community participation and support cannot be over-emphasised. It played a major role in ensuring the Modimolle projects' successes and it is recommended that it be given priority when planning future labour-intensive projects.

It must, however, be noted that any programmes or projects will have their own challenges, whether labour-intensive or conventional construction methods are to be used. However, it is recommended that the project team members be trained and acquire relevant skills to address any difficulties that might be encountered as this research has demonstrated that it is possible to implement a labour-intensive project under many conditions and circumstances.

7.4 FURTHER RESEARCH

Further research needs to be done in the following areas:

- The development and training of emerging contractors to implement labour-intensive construction projects.
- The maximum duration permissible for local labourers to work on labour-intensive projects.
- The comparison of a "force account" system and the development of SMMEs in labour-intensive projects in South Africa.
- The analysis and evaluation of EPWP Phase 1 and Phase 2. Critical investigation and analysis are required to check whether it has reached its original stated objectives – in particular, with regard to the number of man-days of employment generated and the quality and quantity of assets created.

REFERENCES

Coukis, B. 1983. Labour-based Construction Programs: A Practical Guide for Planning and Management. Oxford: Oxford University Press for the World Bank.

De Veen, J.J. 1980. *The Rural Access Roads Programme: Appropriate Technology in Kenya*. Geneva: International Labour Organisation.

De Veen, J.J. 1983. *The Rural Access Roads Programme: Appropriate Technology in Kenya*. Geneva: International Labour Organisation.

EPWP (Expanded Public Works Programme) 2004. *Consolidated Programme Overview and Logical Framework Phase I*. Version 6. Pretoria: Department of Public Works.

EPWP (Expanded Public Works Programme) 2011. *Environment and Culture Sector EPWP Phase II Logframe: 2010 to 2014*. Version 1. Pretoria: Department of Public Works.

GCIS (Government Communication and Information System). 2009. *Local Government Resource Centre*.
http://www.gcis.gov.za/resource_centre/contact_directory/index.html
Accessed: 3 March 2009.

Gertzen, D.M. 1999. *An evaluation of labour-based urban street construction in Soweto during the period 1992-1996 with particular reference to small contractor development*. Unpublished MSc report. Johannesburg: University of the Witwatersrand, 1999.

Greyling, M.R. 1994. *Critical analysis of labour-intensive road projects in South Africa funded from the sale of strategic oil reserves*. Unpublished MSc Dissertation. Johannesburg: University of the Witwatersrand.

Hattingh, J., McCutcheon, R.T. and Richardson, A.E. 2007. "Practical implementation of a philosophy towards increased job creation for the construction industry as a whole". Department of Public Works / International Labour Organisation. 12th Regional Seminar for Labour-Intensive Construction, 8th to 12th October 2007. Durban.

McCutcheon R.T. and Taylor Parkins F.L.M. (eds.) 2003. *Employment and High Standard Infrastructure*. Johannesburg: Research Centre for Employment Creation in Construction, University of the Witwatersrand.

McCutcheon, R.T 1991. "The main findings of the district pilot project of labour-intensive road construction and maintenance: Botswana". *Development Southern Africa*: 8(3): May 149.

McCutcheon, R.T 1993. Kenya: the Rural Access Programme 1974 to 1986. *Orientation Course on Labour-based Road Engineering*: Section 3.2: Case Studies. DELFT: IHE 22.

McCutcheon, R.T 1995. "Employment creation in public works". *Habitat International*: 19(3): 331-335.

McCutcheon, R.T. 1983. *District Pilot Project of Labour-intensive Road Construction and Maintenance. Final Report, CTP 17*. Geneva: International Labour Organisation (ILO). September 1983, 108pp.

McCutcheon, R.T. 1992. Botswana: A description of the district roads improvement and maintenance programme. *Development Southern Africa*: 9(3): 269-294.

McCutcheon, R.T. 2003. "Concepts, potential, principles, issues, lessons and guidelines". In: McCutcheon, R.T. and Taylor Parkins, F. (eds.) 2003. *Employment and High Standard Infrastructure*. Johannesburg: Research Centre for Employment Creation in Construction, University of the Witwatersrand.

McCutcheon, R.T. 2002. *Graduate Diploma in Engineering: course lecture notes*. Johannesburg: University of the Witwatersrand.

McCutcheon, R.T. and Taylor Parkins, F. (eds.) 2003. *Employment and High Standard Infrastructure*. Johannesburg: Research Centre for Employment Creation in Construction, University of the Witwatersrand.

McCutcheon, R.T. and Taylor Parkins, F.L.M. 2011. *The Expanded Public Works Programme: policy, rhetoric, reality and opportunities foregone during the expenditure of over R40 billion on infrastructure*. IMESA Seminar 26 August 2011 held in Centurion (Tshwane Metropolitan Municipality).

McCutcheon, R.T., Hattingh, J., and Croswell, J.A. 2007. "Re-engineering high standard heavily trafficked roads to achieve the objectives of the Expanded Public Works Programme". *Institution of Municipal Engineers of South Africa 71st Conference, Durban*. 22-28 October 2007.

Modimolle (Modimolle Local Municipality) 2003. *Modimolle Local Municipality Integrated Development Plan 2002/03*.
www.modimolle.gov.za
Accessed: 19 July 2006.

Modimolle (Modimolle Local Municipality) 2009. *Modimolle Local Municipality Integrated Development Plan 2009/10*.
www.modimolle.gov.za
Accessed: 09 August 2010.

Mthombeni C.A. 1996. *A Critical Analysis of Community-Based Public Works Programme (CBPWP) in South Africa*. Unpublished MSc Dissertation. Johannesburg: University of the Witwatersrand.

Ngebulana M.R. 2007. *Evaluation of Labour-Intensive Construction Projects in Madibeng Municipality, North West Province, South Africa*. Unpublished MSc report. Johannesburg: University of the Witwatersrand.

Pama M.C. 1992. *Productive employment creation in road construction and maintenance in Lesotho: the critical importance and nature of training*. Unpublished MSc report. Johannesburg: University of the Witwatersrand.

Quainoo H.A. 2010. *Comparative Study of Five-Country-Specific Labour-Intensive Infrastructure Development Programmes: Implications for South Africa*. Unpublished PhD Thesis. Johannesburg: University of the Witwatersrand.

Quainoo, H.A. and McCutcheon, R.T. 2009. "A comparative study of four country-specific labour-intensive infrastructure development programmes: Policy implications for sub – Saharan countries including South Africa". In: Graham Wrightson (ed) *Labour Underutilisation, Unemployment and Underemployment, incorporating the 11th Path to Full Employment Conference and 16th National Conference on Unemployment*, 3 – 4 December 2009, Centre of Full Employment and Equity, The University of Newcastle, Australia, Proceedings - Refereed Papers: pp243-258.

RSA (Republic of South Africa) 1993. Occupational Health and Safety Act, Act No. 85 of 1993. *Government Gazette*: Vol. 2471 No. 15369. Pretoria: Government Printer.

RSA (Republic of South Africa) 1997 Extension of Security Tenure Act, Act No. 62 of 1997. *Government Gazette*: Vol. 389 No. 18467. Pretoria: Government Printer.

RSA (Republic of South Africa) 2000. Local Government: Municipal Systems Act No. 32 of 2000. *Government Gazette*: Vol. 425 No. 21776. Pretoria: Government Printer.

RSA (Republic of South Africa) 2002. Ministerial Determination No. 3: Code of Good Practice for Employment and Conditions of Work for Special Public Works Programmes. *Government Gazette*: No. 23045: Notice 465. Pretoria: Government Printer.

RSA (Republic of South Africa) 2003. Local Government: Municipal Finance Management Act No. 56 of 2003. *Government Gazette*: Vol. 464 No. 26019 Pretoria: Government Printer.

RSA (Republic of South Africa) 2004. Division of Revenue Act, Act No. 5 of 2004. *Government Gazette*: Vol. 465 No. 26222. Pretoria: Government Printer.

SAFCEC (South African Federation of Civil Engineering Contractors. 2003. *Wage Schedule*.
http://www.safcec.org.za/upload/civil_det.htm
accessed on 17 July 2007.

Simpson, J. 1980. "The Design, Construction and Maintenance of Low Cost Roads". Proceedings*: International Roads Federation 4th African Conference*. Nairobi 20-25 January 1980.

Solberg, K., Nteta, D.A.N. and Tessem, T. 1990. *LG34: Districts Roads Labour-Intensive Improvement and Maintenance Programme Project Review*. Oslo: NORAD. 58pp plus 6 Annexures. May.

SSA (Statistics South Africa): Statistical release P0210. 2009. *Labour Force Survey: Historical Revision September Series 2000 to 2007*. Pretoria: Statistics South Africa.

ANNEXURE A:
RESUMÉ OF MS MPHO LEKOLOANE

Briefly about the Project Manager, Ms Mpho Lekoloane:

Ms Mpho Lekoloane was a Project Manager at Modimolle labour-intensive programme. She was trained on labour-intensive construction methods in Lesotho, through the Province of Limpopo under the programme "Gundo Lashu".

Training received:

Ms Lekoloane attended a "labour-intensive based methods of road construction" course at Lesotho Department of Rural Roads as an initiative of the Limpopo Public Works, Road Agency Limpopo (formerly Northern Province Road Agency) and the International Labour Organisation between February 2002 and July 2002. She was trained as a Technical Assistant for Nenis Construction. The training she covered when in Lesotho includes: supervision of works, setting out using labour-intensive methods, management of labour-intensive construction for roads, site administration for labour-intensive works, tendering for labour-intensive works, monitoring work programmes for labour-intensive work, and using task rates and measurements of task as an incentive for production.

Projects undertaken:

Regravelling of roads using labour-intensive methods at Ha-Koali/Sebekela Village at Teyateyaneng in Lesotho.

At Nenis Construction Ms Lekoloane was appointed as a Site Agent.

The list of her duties between August 2002 and November 2003 was:

Overall management of site/works and all inputs (labour, tools, materials, fuel and equipment); setting out of works prior to construction as well as measurements of tasks; site administration; liaison with the Community Liaison Officer on behalf of social facilitators and the Project Steering Committee; construction supervision; monitoring work progress and updating work plans; tendering for labour-intensive works on behalf of the contractor.

Projects undertaken:

Regravelling of roads using labour-intensive methods at Tswaing/Lesetsi Village at Ga-Mphahlele (Lepelle-Nkumpi Municipality Region). Project value: ~ZAR980 000.

Additional information about the Gundo Lashu programme:

Ngebulana (2007) notes the achievement of Gundo Lashu was that 24 contractors were trained under the programme and 2 400 people who had no income received a monthly remuneration through the creation of 320 000 work-days that were created through the programme. It is further indicated that the contractor employed between 60 and 100 local workers on a task-based payment system and that on average 51 % of workers were women, 58 % youth. By 2004, the budget for the programme was R50 million and it was achieving a 600 % increase in employment compared to similar conventional machine-intensive road works without increasing the overall cost per kilometre (Phillips, 2004 quoted in Ngebulana 2007).

ANNEXURE B:
EXAMPLE OF A TIMESHEET
MARCH 2005

An example of a time sheet used for a fortnight during March 2005 is provided on the next page.

TEMPORARY WORKERS

WEEKLY TIME RECORD FOR PERIOD 05 MARCH 2005 TO 18 MARCH 2005

MPLOYEE NAME	ID NUMBERS	TASK COMPLETE	NO. OF DAYS WORKERS	RATE PER DAY	NETT PAY	UIF	VOTE NUMBER
1. BALOYI JOHANNES	620215 5965 086	10	10	R35-00	R350-00	R3-50	304/0027/0(
2. BALOYI LAWRENS	760514 5390 083	10	10	R50-00	R500-00	R5-00	304/0027/0(
3. BALOYI RUTH	740610 0675 083	10	10	R35-00	R350-00	R3-50	304/0027/0(
4. BALOYI PETRUS	760111 5962 084	10	10	R35-00	R350-00	R3-50	304/0027/0(
5. BALOYI SABINA	550316 0710 081	10	10	R35-00	R350-00	R3-50	304/0027/0(
6. BOYE MARIA	800601 0282 084	9	9	R35-00	R315-00	R3-15	304/0027/0(
7. CHABALALA MARIA	790315 1081 088	10	10	R35-00	R350-00	R3-50	304/0027/0(
8. CHAUKE FLORA	750212 0489 081	9	9	R35-00	R315-00	R3-15	304/0027/0(
9. CHEPAPE OLYVIA	680303 0609 086	8	8	R35-00	R280-00	R2-80	304/0027/0(
10. CHILANDO PAULUS	810805 5500 089			R75-00			304/0027/0(
11. CHOKWE OBADIA	770101 5689 082			R75-00			304/0027/0(
12. CHUMA SAMUEL	670110 5305 087	10	10	R35-00	R350-00	R3-50	304/0027/0(
13. DAPO PETRUS	580605 6019 080	10	10	R50-00	R500-00	R5-00	304/0027/0(
14. KAISARA ISIAH	640512 6011 084	10	10	R65-00	R650-00	R6-50	304/0027/0(
15. KEETSE JAMES	530603 5727 086	10	10	R35-00	R350-00	R3-50	304/0027/0(
16. KEKAE JAN	560902 5469 084	10	10	R65-00	R650-00	R6-50	304/0027/0(
17. KEKANA HENDRICK	560709 5806 086	10	10	R35-00	R350-00	R3-50	304/0027/0(
18. KHOZA LUCAS	821215 5391 082	17	9	R35-00	R595-00	R5-95	304/0027/0(
19. KHOZA NKELE	751205 0981 080	10	10	R35-00	R350-00	R3-50	304/0027/0(
20. KHOZA OBED	700910 6026 085	8	8	R35-00	R400-00	R4-00	304/0027/0(
21. KOLOBE HANDRICK	790602 5981 086	19	9	R35-00	R665-00	R6-65	304/0027/0(
22. LEBELO FRANS	750114 0701 087	7	7	R35-00	R245-00	R2-45	304/0027/0(
23. LEBELO MOLOKWANE	710601 5965 088	16	10	R35-00	R560-00	R5-60	304/0027/0(

ANNEXURE C:
EXAMPLE OF A TIMESHEET
JULY/AUGUST 2006

An example of a time sheet used for a fortnight during July/August 2006 is provided on the next page.

TEMPORARY WORKERS

WEEKLY TIME RECORD FOR PERIOD 24 JULY 2006 TO 04 AUGUST 2006

MPLOYEE NAME	ID NUMBERS	TASK	NO. OF DAYS WORKERS	RATE PER DAY	NETT PAY	UIF	VOTE NUMBER
1. BALOYI JOHANNES	620215 5965 086	25	10	R55-00	R1375-00	R13-75	304/0027/007
2. BALOYI LAWRENS	760514 5390 083	25	10	R75-00	R1875-00	R1875	304/0027/007
3. BALOYI LEWIS	691212 6250 082	20	8	R55-00	R1100-00	R11-00	304/0027/007
4. BALOYI RUTH	740610 0675 083	25	10	R55-00	R1375-00	R13-75	304/0027/007
5. BALOYI SABINA	550316 0710 081	25	10	R55-00	R1375-00	R13-75	304/0027/007
6. BOYE MARIA	800601 0282 084	25	10	R55-00	R1375-00	R13-75	304/0027/007
7. CHABALALA MARIA	790315 1081 088	25	10	R55-00	R1375-00	R13-75	304/0027/007
8. CHAUKE FLORA	750212 0489 081	25	10	R55-00	R1375-00	R13-75	304/0027/007
9. CHEPAPE OLYVIA	680303 0609 086	25	10	R55-00	R1375-00	R13-75	304/0027/007
10. CHILANDO PAULUS	810805 5500 089	25	10	R85-00	R2125-00	R21-25	304/0027/007
11. CHUMA SAMUEL	670110 5305 087	25	10	R55-00	R1375-00	R13-75	304/0027/007
12. DAPO PETRUS	580605 6019 080	25	10	R75-00	R1875-00	R18-75	304/0027/007
13. KEETSE JAMES	530603 5727 086	22	9	R55-00	R1210-00	R12-10	304/0027/007
14. KEKANA HENDRICK	560709 5806 086	22	9	R55-00	R1210-00	R12-10	304/0027/007
15. KHOZA LUCAS	821215 5391 082	25	10	R55-00	R1375-00	R13-75	304/0027/007
16. KHOZA NKELE	751205 0981 080	25	10	R55-00	R1375-00	R13-75	304/0027/007
17. KHOZA OBED	700910 6026 085	23	9	R75-00	R1725-00	R17-25	304/0027/007
18. LEBELO FRANS	750114 0701 087	25	10	R55-00	R1375-00	R13-75	304/0027/007
19. LEBESE MITTAH	781010 0912 083	25	10	R55-00	R1375-00	R13-75	304/0027/007
20. LEHUTSO FRANS	570411 5452 086	25	10	R75-00	R1875-00	R18-75	304/0027/007
21. LEHUTSO TOBIAS	531005 5708 083	25	10	R55-00	R1375-00	R13-75	304/0027/007
22. LEKALAKALA HENDRICK	621124 5603 086	25	10	R85-00	R2125-00	R21-24	304/0027/007
23. LERUMO MINNA	591211 0652 089	25	10	R55-00	R1375-00	R13-75	304/0027/007