Comparative Study of Five-Country-Specific Labour-Intensive Infrastructure Development Programmes: Implications for South Africa

Harry Akyen Quainoo

Thesis submitted to the Faculty of Engineering and the Built Environment,
University of the Witwatersrand,
in full fulfillment of the requirements for the degree of
Doctor of Philosophy

September 2010

DECLARATION

I declare that this thesis is my own, unaided work. It is submitted for the degree of Doctor of Philosophy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

_____

(Signature of Candidate)

_____ **day of** _____ **(year)** _____

ABSTRACT

Unemployment and abject poverty in South Africa are widespread, persistent and disproportionately high. These problems are aggravated by inadequate capacity at all tiers of government and huge infrastructure backlogs in rural South Africa. Employment-intensive means of infrastructure delivery have been successfully implemented in several sub-Saharan African countries and elsewhere to generate employment and reduce poverty. It should be possible to replicate similar large-scale national programmes in South Africa. But South Africa has failed. Both prior to and since 1994, several supposedly employment-intensive programmes have been implemented in South Africa with poor results. In an endeavour to contribute to future South African policy and good practices regarding employment, this thesis describes and analyses in detail five major Sub-Saharan programmes and reaches conclusions regarding their achievements and shortcomings. Lessons derived bridge the knowledge gap between the large-scale programmes embarked upon in the sub-Saharan countries in the mid-1980s and the year 2007; these lessons should be applied to future endeavours in South Africa to generate significant employment per unit of expenditure and contribute to poverty alleviation. A major conclusion reached was that the success of employment-intensive infrastructure development programmes depends to a large extent on fundamental factors such as appropriate and implementable policy, government commitment, adequate and sustainable funding, adequate capacity and good preparation. Specifically, the thesis demonstrated that prior to implementation a sufficient timeframe is required for programme preparation in order to make significant contribution towards poverty reduction. Equally, national programme expansion requires a strategic balance between centralisation and decentralisation. In particular, for programme extension and decentralisation, due regard must be given to training and capability building and available resources. Deriving from the thesis' major conclusions, the author developed three crucially important frameworks for anti-poverty infrastructure development programmes, namely; a four-phased model for evaluating the chances of success of infrastructure programmes, a five-phased result-oriented guidelines for testing the workability of infrastructure development policies, and a practical guideline for monitoring and evaluating employment-creation programmes that maximises the benefits thereof and pre-empts institutional memory loss through systematic knowledge management.

DEDICATION

To my nuclear and all extended family members, for the unfading support and encouragement accorded me.

ACKNOWLEDGMENTS

The Author gratefully acknowledges Professor R.T. McCutcheon, the supervisor of this thesis, for the invaluable support, unflinching encouragement, and for making available the necessary funding to travel to Botswana, Ghana, Kenya, Lesotho and Malawi to gather data for the thesis.

In addition, the author wishes to thank the following government officials and individuals for the support, personal communications and cooperation during the collection of data:

Botswana:

- Mr. Mex. Muatjetjeja, Senior Lecturer, University of Botswana, Gaborone
- Mr. S.C. Kobole, Private Consultant, Gaborone
- Mr. R. Molojwane, Principal Development Officer, Ministry of Local Government and Development Planning, Gaborone

Ghana:

- Mr. R.J. Abban, Director of Contractor Development Programme, Ghana Feeder Roads, Accra
- Dr. S.K. Ampadu, Senior Lecturer, Department of Civil Engineering, Kwame Nkrumah University of Science & Technology, Kumasi
- Mr. E.N.K. Ashong, Director of Ghana Feeder Roads Programme, Accra
- Mr. H. Danso, National Coordinator, Ghana Feeder Roads, Programme, Accra
- Mr. T. Bradbury, DFID representative for Small Contractor Development Programme (2002) Accra

Kenya:

- Mr. S. Gitau, Senior Superintending Engineer, Ministry of Roads & Public Works, Nairobi
- Mr. S. Muthua, Technical Advisor, ILO office in Nairobi
- Mr. E. Goss, (seconded from DANIDA), Roads 2000 Technical Advisor, Kenya Roads Board, Nairobi
- Mr. F.D. Karanja, Chief Superintending Engineer, Ministry of Roads & Public Works, Nairobi

Lesotho:

- Mr. M. Ntoi, Civil Engineer, Lesotho Labour-intensive Construction Unit, LCU, Maseru

Malawi:

- Mr. J. Chagunda, National Coordinator, Malawi Rural Travel & Transport Program, Lilongwe
- Mr. H. Kumwenda, Planning Engineer, Ministry of Local Government & Development, Lilongwe
- Mr. A.O. Lwanda, Programme Engineer, Malawi Rural Travel & Transport Program, Lilongwe
- Mr. M.K.M. Mwale, Deputy Director of Roads, Ministry of Transport, Public Works, & Housing, Lilongwe
- Dr. I. Ngoma, Senior Lecturer / Director of Malawi Transportation

Technology Transfer Centre, Department of Civil Engineering, Polytechnic University of Malawi

Special appreciation to the following for the diverse supports and encouragements:

- Ms. T.M. Mtselu, Senior Administrative Manager, School of Civil & Env. Engineering, University of the Witwatersrand
- Mr. W.P.C. van Steenderen, Private Consultant, and formerly Research Fellow, School of Civil & Env. Engineering, University of the Witwatersrand (author's thesis proof reader)
- Professor M. Gohnert, Head, School of Civil & Env. Engineering, University of the Witwatersrand
- Professor A. Taigbenu, Professor of Hydraulic and Water Engineering, School of Civil & Env. Engineering,/ Assistant Postgraduate Dean, FEBE, University of the Witwatersrand
- Professor A.Elvin, Professor of Structural Engineering, School of Civil & Env. Engineering, University of the Witwatersrand
- Dr. J.G. Ndiritu, Senior Lecturer, School of Civil & Env. Engineering, University of the Witwatersrand
- Professor L. Dison, Visiting Professor, School of Civil & Env. Engineering, University of the Witwatersrand
- All other academic staff, School of Civil & Env. Engineering, University of the Witwatersrand
- Dr. W. Rubombora, Medical Doctor/Practitioner, Johannesburg
- Mr. M.Z. Chirwa, Civil Engineer / Private Consultant, Johannesburg
- All friends and colleagues who supported me during the research

Above all, my special thanks to God, the Creator, for the grace and strength to complete the PhD programme.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ADB	**African Development Bank**
ADBI	**Asian Development Bank Institute**
AFD	**Agence Française de Développement (French Government)**
AGL	**Assistant Gang Leader**
ASGISA	**Accelerated and Shared Growth Initiative of South Africa**
AUSAID	**Australian Agency for International Development**
BIDPA	**Botswana Institute for Development Policy Analysis**
BOOT	**Build-Own-Operate-Transfer**
BSSA	**Business Support Southern Africa**
CETA	**Construction Education Training Authority, South Africa**
CIA	**Central Intelligence Agency**
CIDA	**Canadian International Development Agency**
CIDB	**Construction Industry Development Board, South Africa**
COTA	**Cost of Technique Analysis**
COTA-P	**Derivative of COTA**
CRIMP	**Central Region Infrastructure Maintenance Programme, Malawi**
CSP	**Community Sub-Projects**
CTO	**Chief Technical Officer**
CWS	**Civil Works Section**
DANIDA	**Danish International Development Agency**
DCRU	**District Council Roads Unit**
DFID	**Department for International Development, UK**
DFR	**Department of Feeder Roads, Ghana**
DR	**Drought Relief**
DRE	**District Roads Engineer**
DRIMP	**District Roads Improvement and Maintenance Programme**
DRR	**Department of Rural Roads**
DUR	**Department of Rural Roads**
EC	**European Community**
EPWP	**Expanded Public Works Programme**
EU	**European Union**
FIDIC	**Fédération Internationale des Ingénieurs Conseils, Geneva**
GDP	**Gross Domestic Product**
GHA	**Ghana Highway Authority**
GL	**Gang Leader**
GNP	**Gross National Product**
GOK	**Government of Kenya**
GOL	**Government of Lesotho**
GTZ	**Deutsche Gesellschaft für Technische Zusammenarbeit**
HQ	**Headquarters**
IDA	**International Development Association**
IDT	**Independent Development Trust**
IFC	**International Finance Corporation**
ILO	**International Labour Organisation**

IMF	**International Monetary Fund**
ITT	**Intermediate Transport Technology**
KfW	**Kreditanstalt für Wiederaufbau, Germany**
KRARP	**Kenyan Rural Access Roads Programme**
LCU	**Labour Construction Unit, Lesotho**
LG117	**Local Government programme number 117, Botswana**
LG34	**Local Government programme number 34, Botswana**
LG38	**Local Government programme number 38, Botswana**
L-I	**Labour-intensive**
LITU	**Labour Intensive Training Unit**
MASAF	**Malawian Social Action Fund**
MIGA	**Multilateral Investment Guarantee Agency**
MK	**Malawian Kwacha**
MLGL	**Ministry of Local Government and Lands**
MOTC	**Ministry of Transport and Communications**
MOW	**Ministry of Works**
MPA	**Major Projects Association**
MPBS	**Maintenance Performance Budgeting System**
MRP	**Minor Roads Programme**
MRTTP	**Malawi Rural Travel and Transport Program**
MTBPS	**Medium Term Budget Plans**
MWC	**Ministry of Works and Communications**
NORAD	**Norwegian Agency for Development**
OCW	**Open Course Ware**
ODA	**Overseas Development Agency**
OED	**Operations Evaluation Department**
PDL	**Poverty Datum Line**
P-P-P	**Public Private Partnership**
PSC	**Public Service Commission**
PWP	**Public Works Programme**
RAMPA	**Rural Accessibility and Mobility Pilot Activity**
RTC	**Roads Training Centre**
RTIP	**Road Transport Infrastructure Programme**
SADC	**Southern Africa Developing Countries**
SE	**Site Engineer**
SGL	**Senior Gang Leader**
SIDA	**Swedish International Development Agency**
SRDP	**Special Rural Development Programme**
STA	**Senior Technical Assistant**
STO	**Senior Technical Officer**
TA	**Technical Assistant**
TO	**Technical Officer**
UNDP	**United Nations Development Programme**
UNESCO	**United Nations Education, Scientific and Cultural Organisation**
USAID	**United States Agency for International Development**

CHAPTER 1: INTRODUCTION

1.1 Background

In the three decades since 1970s, many African and Asian economies have been grappling with certain endemic socio-economic problems, *inter alia,* deeply entrenched poverty, unemployment and underemployment, inadequate capacity at both local and national levels as well as lack of basic infrastructure. Among these, unemployment is a growing problem. In South Africa, for example, the year 2008 Labour Force (Survey) statistics indicate worsening unemployment conditions in Limpopo Province, Eastern Cape, Mpumalanga, Kwa-Zulu Natal, and North-West Province (Statistics South Africa, 2008:19, 23; Van Wyk, 2003:8).

In addition, the annual proportion of the unemployed has been increased by the number of Grade Twelve /Standard Ten school-leavers who also cannot find work (Frye, 2006:1-2; Banerjee et al, 2008:6-7). A further contemporary and prevalent problem has been the general skills deficit at National, Provincial and local tiers of government. The resultant effects have been budget roll-overs in many municipalities, slow pace of infrastructure delivery and the challenge of identifying and attracting professionals to fill the over sixty percent vacant Public Sector positions (Department of Transport, 2005:100; Lawless, 2005; 2007). This is an integrated national crisis that demands serious attention: strategic and long-term planning, and practical action on behalf of the government.

Any such government intervention, therefore, must be context-appropriate, unorthodox but technologically innovative, and value-additive to improve the provision of basic infrastructure for poverty and unemployment alleviation; and use the construction process to train and develop skills in workers and "professionals". The thesis essentially makes a comparison of successful labour-intensive road programmes carried out in the sub-Saharan Africa, and draws far-reaching implications for South Africa's ailing national infrastructure programmes. McCutcheon's early systematic documentation between 1989 and 1992 (McCutcheon, 1989b; 1991b) focused primarily on the Kenya and Botswana programmes that were implemented in the mid-1980s. However, several subsequent programmes have been implemented since the 1980s in these two countries. In addition, successful large-scale multiple programmes have also been implemented in Ghana, Malawi and Lesotho, modelled after Kenya's initial programme. Thus, this thesis bridges the knowledge gap between the mid-1980s and 2007

about anti-poverty initiatives made through basic infrastructure provision. Together, these sub-Saharan experiences hold rich lessons for South Africa; it should be able to implement successful large-scale poverty reduction programmes provided certain rudimentary and preparatory principles are followed.

1.2 Problem Definition

Though difficult to establish causality, adequate and well-managed infrastructure stock of a country has the potential of determining the economic health of its citizenry and help fight poverty (World Bank, 1994). Various attempts have been made globally, to help solve the soaring unemployment and poverty issues. These included scrutiny of the post-independence economic development policy in the 1960s, and the construction industry in the light of its nature and delivery mechanism. According to the development theory, the premise upon which the economic development policy was formulated, was that urbanisation and industrialisation would lead to rapid economic growth culminating in improvement of quality of life, and facilitate easy transfer of technology from the rich to poor countries (Bernstein, 1973:63, 233; McCutcheon and Howe, 1993; Adelzadeh, 2007:5-7). Policies were formulated in the 1960s to promote the importation of equipment for conventional construction work (Bernstein, 1973:13).

The project environment in most African countries at the time of independence was favourable comparable with South Korea: a small population and low growth rates, availability of foreign exchange, and high cost of labour. However, the growing unemployment and underemployment levels are indicative of the failure of the theory necessitating the need to search for alternative solutions. Principal reasons could be attributable to (i) inability to forecast and internalise the amount of training and mentorship involved in the technology transfer; and (ii) application of Western methodologies without due regard to complex requirements of developing countries in terms of local needs and resources.[1] What several governments failed to appreciate was that development programmes often take place in a complex environment. Thus effective impact demands an understanding of the underlying political, institutional and external environments in addition to the socio-economic dynamics of potential beneficiaries.

[1] Personal Communication: Sohail to Quainoo, 2004. Dr M. Sohail is a Senior Research Manager at Loughborough University Technology Centre, UK.

Following the failure of the development theory, Deepak Lal in the 1970s examined the way things were done in the production sector to distinguish where machines were essential and where labour could be used in place of machinery in the construction sector. His main arguments were that it is possible to think of substitution of labour for equipment where:

- product (in this case, infrastructure creation) is made up of a series of partial products and has considerable opportunity for discontinuity; and
- energy-powered machines / equipment are merely magnified versions of old hand-tools.

These were significant conclusions contributing to the quest for alternative but innovative means of providing infrastructure through the construction industry. The limitation lay in the theoretical nature of his conclusions. Therefore, fieldwork was needed to test the validity of Deepak's theory. The World Bank 1971-1986 study into the effective substitution of labour for equipment reached one major conclusion: labour-intensive methods of civil construction are technically feasible and economically efficient, and generally produce the same quality of product as equipment intensive methods (World Bank, 1986b). The findings have had a profound impact on the civil engineering industry, causing governments and construction companies to give consideration to employment-intensive methods of construction which have the potential of providing significant employment per unit of expenditure (McCutcheon, 1991a).

Supplementary research by McCutcheon (1991a) to investigate the nature of the South African construction industry revealed a highly capital-intensive segment of the national economy (less employment per unit of expenditure) which defeats the aim of employment creation and poverty alleviation efforts. The construction industry, materials inclusive, constitutes about 7.5 per cent of the national economy, and civil engineering forms approximately 3-6 percent of the economy with earthworks alone accounting for 50% of the total construction cost. The industry cannot solve the socio-economic problems mentioned above, but with appropriate instruments could help alleviate unemployment and poverty. Given that the principal source of funding for the construction industry is the public sector, pragmatic policies embedded in infrastructure provision strategy should be put in place to generate employment in order to reduce poverty.

On the African continent, strategies and guidelines for implementing development programmes aimed at employment generation and poverty alleviation have been highlighted by McCutcheon (1989a). Based on theory and experience in Iran and Kenya (Kenyan Rural Access Road Programme) McCutcheon postulated that it is possible to run a successful national infrastructure programme (a springboard for development) labour intensively, develop skills through training and achieve a significant increase in employment per unit of expenditure without compromising quality of product, cost or time. Furthermore, McCutcheon (1989a) codified lessons learnt from experience into *Theory and Principles of Employment-intensive Engineering* juxtaposed with a four-phase approach for implementing a successful National programme. Complementary work done by and in association with *Work* Research Centre, University of the Witwatersrand, resulted in the production of COTA /COTA-P,[2] and *Team Balancing Exercise*,[3] aimed at helping planners and implementers improve employment-intensive infrastructure construction design and results in the fight against poverty and unemployment.

Successful replication of programmes similar to the Kenyan Rural Access Programme in countries like Botswana, Ghana, Lesotho and Malawi, epitomizes the significance and relevance of McCutcheon's work for South Africa today. In a paper presented at the First International Conference on Employment Creation in Development, McCutcheon (2001) recorded the achievements by the programmes in the five countries mentioned above:

- thousands of kilometres of rural roads have been constructed and maintained;
- hundreds of thousands of person years of employment generated; and
- thousands of skilled people produced from associated training programmes.

Analysis revealed that five to seven times more employment was generated per unit of expenditure, without compromising cost, quality, or time. The potential has been proven in large-scale operations over two decades. Kenya's experience was hailed as the best known donor-funded labour-intensive infrastructure programme (World Bank, 1986a).

[2] Developed by Dr. S. Phillips and Mr. F. Taylor-Parkins respectively in the mid- and late 1990s
[3] Team Balancing Exercise was developed by Mr. J. Croswell and Professor RT McCutcheon in the 1990s; Basil Coukis, 1983

To date, there has been a lack of replication of Kenyan's experience of national employment-intensive infrastructure programmes in South Africa notwithstanding the country's high levels of unemployment, general lack of capacity and skills, and poverty. What are the underlying reasons for this phenomenon?

Research by McCutcheon clearly shows that pre- and post-1994 attempts to implement large-scale programme such as the National Public Works Programme (which had an integrated Community Based Public Works Programme as a precursor to the actual implementation), in South Africa all yielded mixed results (McCutcheon, 1995). The Expanded Public Works Programme with over R 30 billion infrastructure Budget has also not performed as expected. Several reasons account for the *non-delivery*: lack of Engineers and Managing Contractors (Dison, 2008),[4] insufficient planning[5] and overly political interference to the exclusion of objectivity in programme planning and sound management. Moreover, performance of the Small-contractor development programmes to outsource work has been unsatisfactory: only 1.4% of contractors trained survive the first five years (McCutcheon and Croswell, 2005, Egbeonu, 2004).

As indicated by Mintzberg (1994), *every failure to implementation, is by definition, also a failure of formulation:* poor implementation results from weak strategy formulation. Nevertheless, in accordance with arguments for and against *force-account* systems of infrastructure programme delivery versus *outsourcing or contracting* (Friedman, 1948), one of Mintzberg's main conclusions was that *"formal staffs can simply create political games";* outsourcing is arguably a more appealing option. Why then the high failure rate and poor quality of delivery amongst emerging contractors?

1.3 Research Questions

[4] Personal Communication: Dison to Quainoo, 2008. Professor D.L. Dison is a Visiting Professor in the School of Civil and Environmental Engineering, University of the Witwatersrand.
[5] Personal Communication: Malele to Van Steenderen, 2008. Mr. R. Malele is a Senior Manager at the Department of Public Works, Limpopo Province.

Most of these large-scale projects were carried out in a non-coherent, uncoordinated and inconsistent manner. Equally, objectives were often ill-defined which inevitably produced poor results. Like most fundamental issues in development, the ineptitude to replicate experiences of employment-intensive programmes carried elsewhere in Sub-Saharan African countries leads to many challenges. On a theoretical level this issue questions the validity of Deepak Lal's and World Bank's main conclusions above. However, these conclusions are still the most convincing to support McCutcheon's (1991a) hypothesis that employment-intensive programmes can contribute significantly towards solving the socio-economic problems facing South Africa today.

On a practical level the inability to replicate similar programmes in South Africa triggers a myriad of questions and an examination of government policy and instruments, the delivery mechanisms and strategies for translating policies into reality. Given the repository of case-studies of successful development programmes, why then the failure to implement similar programmes in South Africa's impoverished provinces? Is it lack of capacity, an institutionalisation problem and/or unfavourable project environment? If lack of capacity, is the government doing enough to attract and retain requisite staff? Or, is the problem symptomatic of government's bad policy instruments and strategies resulting in poor implementation?

What are the underlying root causes for the poor performance of large-scale projects / programmes implemented so far? Technical objectives (specification and quality) are equally as important as the socio-economic goals. However, poor quality of work is widespread amongst emerging contractors. The immediate question is do they have the requisite skills and track record to perform? Does the non-performance stem from project nature of the developments, or was it because they were not treated seriously like mega-industrial programmes? Does the slow pace of delivery lie with the *triarchy* contractual arrangement as described by Dison (2005, 2008).

Whither development programmes? What implications do programme experiences overseas have for South Africa? Answers to these questions will help development practitioners, including government departments to develop effective unemployment reduction frameworks to deal with poverty. Thus, the study's main focus is to analyse the successes and

shortcomings of anti-poverty interventions through the provision of basic infrastructure in five sub-Saharan countries from which lessons could be applied in South Africa.

The foregoing discussions prompted this research to explore the root causes of failure to implement large-scale infrastructure development programmes in the poor provinces in South Africa, and to provide guidelines for programme implementation. Therefore, the present study was undertaken to investigate the reasons behind the inability to implement successful anti-poverty infrastructure development programmes in the above-mentioned provinces, and explore means of achieving socio-economic goals and objectives of long-term (at least 10 years, say) employment generation. In addition the thesis provides guidelines to encourage government to embark upon such programmes, not projects, for effective alleviation of poverty and sustained economic well-being of people in the poorer provinces.

1.4 Research Objectives

In order to contribute to the implementation of large-scale infrastructure development programmes that will foster significant employment creation and poverty reduction in South Africa, the following objectives were formulated:

The overriding objective of the study was to critically describe and evaluate five sub-Saharan employment-intensive infrastructure programmes and use the findings to draw implications for similar, but ailing programmes in South Africa. Deriving from this, specific objectives were as follows:

(i) To describe and evaluate five large-scale development programmes in Sub-Saharan Africa.

(ii) To draw out implications for in South Africa:

- To identify the root causes of inability to implement large-scale employment creation programmes in South Africa.
- To develop policy guidelines for implementing national programmes for results in South Africa’s impoverished provinces.
- To provide guidelines for the evaluation of EPWP infrastructure

programmes in South Africa's poor provinces.

1.5 Significance of the Study

This study is significant because it contributes to our general understanding of the root causes of why many development projects fail to perform, and reasons behind South Africa's inability to implement large-scale infrastructure programmes in its poor provinces. Based on the knowledge gained in relation to the root causes, it will enable policy-makers, developers and infrastructure implementers to craft strategic policies and appropriate delivery mechanisms to combat poverty and unemployment.

The evaluation outcomes will contribute to appropriate programme design and implementation for effective poverty reduction through infrastructure provision. Other significant contributions would be:

- understanding causal mechanisms and the general principles behind employment generation programmes,
- transfer of evaluation findings to South Africa,
- better allocation of resources,
- refinement and strengthening of overall programme performance, and
- development of appropriate evaluation strategy.

1.6 Methodology

1.6.1 Design and Data Collection

To achieve the goals and objectives enumerated in subsection 1.4 above, the following steps were pursued. First, an extensive literature review in the field was carried out to position the research within context. This embraced establishing a theoretical framework and methodological focus for the research; the most important issues and their relevance to the study; controversies and unanswered questions.

Second, critical case-study evaluations (desk and field review) of the following successful programmes were conducted: The Kenyan Rural Access Road Programme; Botswana Road Improvement Programme; Ghana Feeder Roads Programme; Lesotho Labour-based Road

Construction Programme; and Malawi Labour-intensive Road Construction Programme. The purpose of the case studies was to compare the outcomes, main conclusions and strengths of each programme; its significance and contributions; weaknesses, controversies, unresolved issues and limitations; and to draw policy and implementation implications to help strengthen future large-scale employment creation programmes in South Africa. The case study approach has the richness of exploring good practices in respective programmes and the underlying drivers (Yin, 1994; Mora and Friedlander, 1999).

As an explorative and context-specific qualitative methodology, a case study specifically provides an in-depth knowledge for understanding the relationships between processes and results (Morrison, 2001:69, 313; Amaratunga and Baldry, 2001:99; World Bank, 2007a:284, 355). This design methodology is therefore suitable for analysing anti-poverty infrastructure development programmes to determine which approach works. Thus, case studies are learning orientated and assist in comprehending the complexities and challenges inherent in poverty reduction through basic infrastructure provision.

Equally, the use of multiple sources of evidence – country-specific programme documentations, and information from programme participants including relevant government personnel and development agencies – otherwise known as triangulation, renders the employment of a case study approach a more appropriate methodology for the research (Dooley, 2002:336; Morrison, 2001:329). In addition, the ability to generalise research findings and help build a theoretical construct (Dooley, 2002:336) makes case study design methodology instrumental in analysing essential, complementary, ingredients necessary for predicting the success or failure of employment-intensive infrastructure programmes (see subsection 9.3). The achievements and shortcomings of the five country-specific programmes provide a basis for analysing South Africa's inability to *replicate* similar successful employment-intensive programmes.

However, despite its generalisation ability and power of providing detailed causal explanations of phenomena, case studies are criticised for bias and hasty generalisation of research findings (Amaratunga and Baldry, 2001:100). Nonetheless, research indicates the multiple nature of the study (in this instance, case studies from five different countries) strengthens the reliability and external validity of the research findings (Ibid). In particular, synthesizing information from multiple sources reduces the chances of misinformation that

could affect the reliability and generalisation of the research conclusions (Golafshani, 2003:603). To guarantee reliability of results, an identical semi-structured interview was used to gather data for each of the five country-specific programmes. This was done to complement information obtained from documented reports. The questions, as shown below, were divided into four parts, namely, programme description, implementation strategy, achievements and interviewee's evaluation of the programme.

PROGRAMME / PROJECT DESCRIPTION

(1) What is the programme about? When was its inception, and proposed duration?
(2) What were the goals and objectives?
(3) Who were the intended beneficiaries?
(4) Why did the Government embark upon this programme?
(5) What was the scope of the project / programme?
(6) Method of implementation?
(7) What was the proposed budget?
(8) Source and structure of programme finance?
(9) Who were the stakeholders, and what were their roles?

IMPLEMENTATION STRATEGY

(1) Was the programme started as a pilot project? If so, was it successful?
(2) In which government department was the programme instituted?
(3) What was the degree of participation?
(4) What was the level of preparatory work? (e.g. development of manuals, specifications / level of service, contract documentation, training of trainers, etc)
(4) What selection strategy was used to recruit labour?
(6) Was training an intrinsic component of the programme? If so, what was the entry education requirement? Level of training and duration? How was the quality of training evaluated? Any indicators of success?
(7) Method of delivery: Force account / contracting? Why any particular choice?
(8) Payment system?
(9) Was wage rate attractive compared to equilibrium market price?

PROGRAMME ACHIVEMENTS

(1) If the programme / project had ended, what were the achievements in terms of the stated objectives and unintended effects? (e.g. kilometres of road network compared the situation before the programme started, number of contractors trained, number of staff trained, etc)
(2) If programme is ongoing, what are the achievements so far?
(3) Were employees casual or permanent?
(4) Performance: - effectiveness / efficiency / cost-effectiveness / relevance / sustainability

PERSONAL OPINION OF THE PROGRAMME/ PROJECT

(1) What do you consider to be main strengths and weaknesses of the programme?
(2) Is there anything you wish could have been done differently?

Field data collection which begun in December 2002 was completed in August 2007 in five countries: Ghana, Kenya, Malawi, Botswana and Lesotho. In each country, various Government Departments of Roads and Public Works, Planning, and Local Government were visited for data collection. Extensive analysis via triangulation of programme data was carried out through document review and unstructured personal communications with relevant programme officials from government departments and development agencies. Fruitful discussions and interviews were held with relevant officials in relation to the research topic. Moreover, donor organisations and agencies such as the International Labour Organisation (ILO), World Bank, European Union, and DFID were also visited for data collection.

Furthermore, useful semi-structured discussions were conducted with certain key individuals in the development field such as Sohail;[6] Jennings;[7] and Dison.[8] Third, core problem identification and analysis to establish root causes of failure (internal and external) to replicate large-scale programmes in the impoverished regions was done by critiquing various initiatives made in South Africa during the pre-1994 and post 1994 era. To plan and overcome problems with current development programmes, an assessment of the current position (2007) of infrastructure development programmes (for instance, the Expanded Public Works Programme, EPWP) and what they are capable of accomplishing was made. Deriving from this exercise, "the gap" (between the planned and actual achievements) helped identify the needs.

1.6.2 Data Analysis and Interpretation of Results

[6] Dr. M. Sohail (2004), Senior Research Manager at Loughborough University, UK, Water, Engineering and Development Centre (WEDC)
[7] Mr. D. Jennings (2006, 2007), Director, IT Transport, UK, in charge of organizational development and technology transfer; training and development of contractors and staff in employment-intensive technology in developing countries.
[8] Professor D.L. Dison (2005, 2008) Visiting Professor in the University of the Witwatersrand with over sixty-five years of experience in the field of Civil Engineering; one time President of the South African Federation of Consulting Engineers Council; Chairman of Basil Read; and currently owner of Reinforced Earth South Africa responsible for several hundreds of projects throughout Africa and Indian Ocean Islands.

Ovretveit (1998) in evaluating health interventions defined evaluation as follow:
"*Evaluation is attributing value to an intervention by gathering reliable and valid information about it in a systematic way, and by making comparisons, for the purposes of making more informed decisions or understanding causal mechanisms or general principles."*

This definition is more suitable to the core problem identification as well as the review of the five country-specific programmes mentioned above. The sources of information were programme staff, evaluators, management participants, government records, and personal interviews. The evaluation was both formative (examining the planning and delivery mechanisms of the programmes) and summative (evaluating the outcomes and impacts of programmes), critically examining the relevance of the principles and techniques adopted. Detailed work embraced description and critical review of the following aspects of the programmes (McCutcheon, 1989-2007):

- programme objectives at both conception and implementation;
- detailed description of the scope of work;
- the source and structure of programme finance;
- the decision-making process;
- the institutional framework in which the programmes were located;
- the institutional mechanisms for delivery and implementing employment-generating schemes;
- the degree of participation of intended beneficiaries;
- identified risks and their management;
- the mechanisms for planning and allocation of resources;
- programme success and performance.

Furthermore, the evaluation process also examined the evaluation design and method used, indicators or units of analysis, data collection instruments for evaluation, interpretation of results and the main findings. In an evaluation handbook published by World Bank, Baker (2000) stated difficulties associated with theory-based evaluations in relation to identification of assumptions and theories, availability of right instruments and data, validity of generalisations made and interpretation of results. Nonetheless, if a programme was adequately planned and designed with a carefully structured built-in evaluation plan, as well as clear, measurable and specific objectives, most problems could be eliminated.

In addition to analysing the programmes in terms of their own project brief as described above, further analysis was made benchmarking against the principles of labour-intensive technology. Critical development indicators utilised were socio economic indicators (such as unemployment levels or employment generated, economic growth, percentage of project cost left in respective communities, and female employment offered) and technical objectives (kilometres of road constructed, cost per kilometre, (riding) quality of road constructed, rehabilitated or maintained, road accident rates). To establish whether the hypothesis that policy, political will and commitment; adequate funding; adequate capacity and good preparation are indispensable to the success of every employment-intensive infrastructure development programme, each case study analysis ends with a summary of the strengths and weaknesses of the programme.

The problem identification stage revealed several contributory parameters to the failure to replicate international experience in South Africa. The underlying cause for this lack of *replicability* is due to several inter-related, complex and dynamic environmental factors: from implementation policy and strategy through acute skills shortage to economics.

1.7 Structure of the Thesis

Chapter Two deals with a comprehensive literature review first by examining the impact of employment-intensive infrastructure development programmes on poverty alleviation and underlying reasons for the underperformance. South African experience of employment-intensive initiatives from the 1980s to 2007 is also put under the spotlight to establish reasons for the mixed results. The delivery mechanism is critically interrogated and comparison is made of force account system with contracting approach. In addition, the degree of institutionalisation of evaluation culture in employment-intensive programmes, and current issues and challenges are also examined. A subsection also investigates how knowledge management and apprenticeship can effectively be used to tackle the skills deficiency problem.

Furthermore, to map the way forward for development programmes, a thorough discussion is made in relation to problems and challenges confronting development programmes in Africa. Lack of adequate planning, implementation failure, technical and control management

failures, and absence of commitment from programme planners and implementers characterise most of the programmes. What implications do lessons from mega-industrial projects have for development programmes? To investigate this, two large-scale industrial projects in history, namely: the Alaska Oil Pipeline project in the 1970s, and the Channel-Tunnel project in the 1990s (linking UK to France) are discussed and lessons drawn. The penultimate section examines tools, instruments and good practices for improving the design and outcomes of development programmes. Finally, implications of literature for future employment-intensive infrastructure development programmes are drawn.

Chapters Three to Seven are devoted to case studies of Kenyan Employment-intensive Roads Programme; Ghana Feeder Roads Programme; Botswana Road Improvements Programme; Malawi Labour-intensive Roads Programme and Lesotho labour-based Road Construction Programme. In each of these chapters, a description of the programme background is followed by critical evaluation. Much as these constitute success stories and models for other countries, the problems and shortcomings of each programme are discussed to pre-empt their recurrence in any future similar attempts.

Chapter Eight makes a comparative analysis of the programmes from Chapters Three to Seven and draws lessons and conclusions to guide future similar programmes in South Africa and elsewhere. It culminates in a rule of thumb for predicting the outcome of any development programme.

Failure of most programmes derives from poor implementation strategy triggered by weak policy and inability to create the required enabling environment. Thus a criterion for testing if the policy crafted is *implementable* (for intended results) is crucial. Guidelines for implementing successful programmes have the potential of improving performance. These constitute the subject matter of Chapter Nine.

Intangible programme objectives are difficult to evaluate compared with tangible ones. The problem is acute especially if no indicators for success are provided. Chapter Ten therefore provides a detailed guideline for evaluating employment-intensive infrastructure programmes.

Deriving from the foregoing discussions in preceding chapters, the last chapter draws several conclusions, policy implications and makes recommendations for implementing or replicating

national employment-intensive infrastructure programmes similar to successful experiences in sub-Saharan Africa.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Poverty is multi-faceted and complex with varying degrees of intensity; any good intervention must necessarily commence by defining it and understanding the root causes. Classical definition from World Bank associates poverty with people living on less than $ 1 a day (World Bank, 1990). Given the interplay of economic forces and world market trends, this definition should be modified since current issues make it impossible to survive on such a low level purchasing power. Structurally induced poverty is difficult to uproot and therefore demands well-thought-out intervention programmes.

Where a disproportionately high percentage of society is disenfranchised and isolated from the mainstream economic and decision-making processes over a considerable period of time, poverty is inevitable and widespread. Frequently, political instability and bad governance trigger unemployment and poverty. Among other features, the poor often do not have requisite employable skills and lack access to basic infrastructure and decent standard of living. South Africa, like many developing countries, has not been spared from these socio-economic problems (Wilson and Ramphele, 1989). Unemployment, underemployment and poverty are significantly high (Kingdon and Knight, 2004; Statistics South Africa, 2000 – 2008).

Agreement exists amongst researchers and interventionists in the development field about strategies to poverty reduction with two main constructs emergent: economic growth and provision of basic infrastructure (McCutcheon, 1991a, b; Howe, 1995; World Bank 1994; World Bank 2004a). While McCutcheon, Howe and World Bank's Development Report 1994 emphasise basic infrastructure provision through innovative delivery methods, others like the Shanghai conference reported by World Bank in 2004 over-emphasise sustained economic growth alongside other factors documented by

McCutcheon in 1991a.[1] Thus, poverty reduction approaches range from economic growth through rural economic-base development initiatives to social safety nets and access to micro-finance services (ADBI, 2000, World Bank, 2004a). All these measures are noteworthy in the fight against poverty. These reiterations almost two decades since McCutcheon first categorised them as essential ingredients for implementing successful programmes demonstrates the relevance of his work even today. Another dimension is that we never learn from lessons in programme evaluations – either there is lack of political will and accountability or inadequate prior planning to factor in lessons from previous programmes or projects into current anti-poverty interventions.

However, GNP (or GDP) per capita is a somewhat unsatisfactory measure of development and neither is a good determinant of poverty reduction. Perspectives on growth and development have shifted markedly over the past forty years. During the 1950s and 1960s, development was equated with growth in gross national product (GNP) or GDP, with per capita GNP (income per capita) being the preferred index. Since then, analysts have re-examined the concept of development (Van Ryneveld, 2003).[2] Reasons for the inadequacy of GDP per capita to determine level of development are as follows:

- GNP (or GDP) per capita is essentially a quantitative measure of goods and services produced in the country per inhabitant.

- It is calculated by dividing the total output by the number of inhabitants. As such, it is an average value for the inhabitants of the country – and is not the same for all individuals in the society.

[1] In the theory and principles of employment-intensive infrastructure development programmes, aspects of McCutcheon's reasons for success in 1991 such as sustained / continued political commitment and financial support, empowerment through active participation of the poor, monitoring and evaluation were also echoed by the Shanghai conference in 2004.

[2] Personal Communication: Van Ryneveld to Quainoo, 2003. Dr. M. Van Ryneveld was a senior lecturer in the School of Civil & Environmental Engineering, University of the Witwatersrand, Johannesburg, South Africa.

- Level of development, however, is more than simply "average output per person", and development is more than a progression from poor to rich, from traditional rural to sophisticated urban (i.e. economic betterment).

- It also includes human dignity, security, justice and equity.

- Development is about people – and improvement in people's lives in a sustainable manner.

- Over and above economic growth, therefore, other key dimensions of development include income growth, sustainable livelihoods, environmental sustainability, and institutional capacity.

The preceding paragraph indicates that though sustained economic growth is necessary for poverty reduction, it is insufficient to combat poverty alone. Consequently, it would be over-simplistic to assume a linear causal relationship between economic growth and poverty reduction – as depicted by Figure 2.1. It indicates an expansionary fiscal policy (in relation to spending on public infrastructure for the poor) being pursued by the South African government which is a step in the right direction, though not without some tradeoffs in the quest to strike a balance between monetary and fiscal policies. The diagram shows that both expenditure on public infrastructure and GDP per capita increase almost in tandem. However, instead of unemployment decreasing it rather shows marked increase followed by some fluctuations probably orchestrated by the business cycle. This is a disturbing phenomenon, and demonstrates that reliance on economic growth alone would not suffice, rather appropriate integrated policy and socio-economic measures have to be pursued simultaneously. Furthermore, a close examination of employment trends in Figure 2.1 indicates that labour absorption capacity of industries like Trade and Services (where Government has less influence in terms of level of funding) far outpace that of Construction which has annual budget of approximately R60 billion. According to Medium Term Budget Plan in 2006/7, this amount is expected to reach over R 240 billion in 2011. This raises concern about the

appropriateness of policies and implementation strategies so far crafted and executed in the provision of basic infrastructure for the poor.

Table 2.1: Selected South African Socio-economic indicators

YEAR	GDP, @2000	GDP/Cap*	Expenditure, Public	Unemployment**	Employment created by selected industry,%		
	prices R(bn)	R ('000)	Infrastructure, R (bn)	%	Construction	Trade	Service industry
1994	779.424	17.7		20	4.4	17.4	25.1
1995	803.71	18.3		16.9	5	19.6	27.8
1996	838.326	19.1		21	5.4	17.1	26.7
1997	860.515	19.6	23.1	22.9	5.6	16.3	25.7
1998	864.968	19.7	22.4	26.1	5.2	16.9	31.8
1999	885.365	20.1	23.3	23.3	4.7	18.4	31.2
2000	922.148	12.0	24.7	25.8	5.5	20.7	24.9
2001	947.374	21.5	26.1	29.4	5.2	21.9	16.4
2002	1193.771	27.1	65	30.4	5	19.4	17.3
2003	1277.029	29.0	69	28	5.2	21.3	18.7
2004	1405.529	31.9	73	26.2	5.8	21.8	18.9
2005	1562.785	35.5	80	26.7	6.8	24.6	18.8
2006	1745.795	39.7	101	25.5	6.9	23.9	17.5
2007	1928.295	43.8	120	23	7.6	22.3	18.3
2008	2119.871	48.2	139				
2009	2330.459	53.0	151				
2010	2723.8	61.9	173				

Sources: Statistics SA 2008; Statistics SA 2001; AsgiSA 2007; National Treasury MTBPS, 2002, 2005, 2006, 2007 Statistics SA (OHS 1998, 1999), (LFS, 2000, 2007);

* Own calculations based on Statistics SA GDP data and calculated population of approx. 44 million in the year 2000

** Unemployment figures are based on formal definition

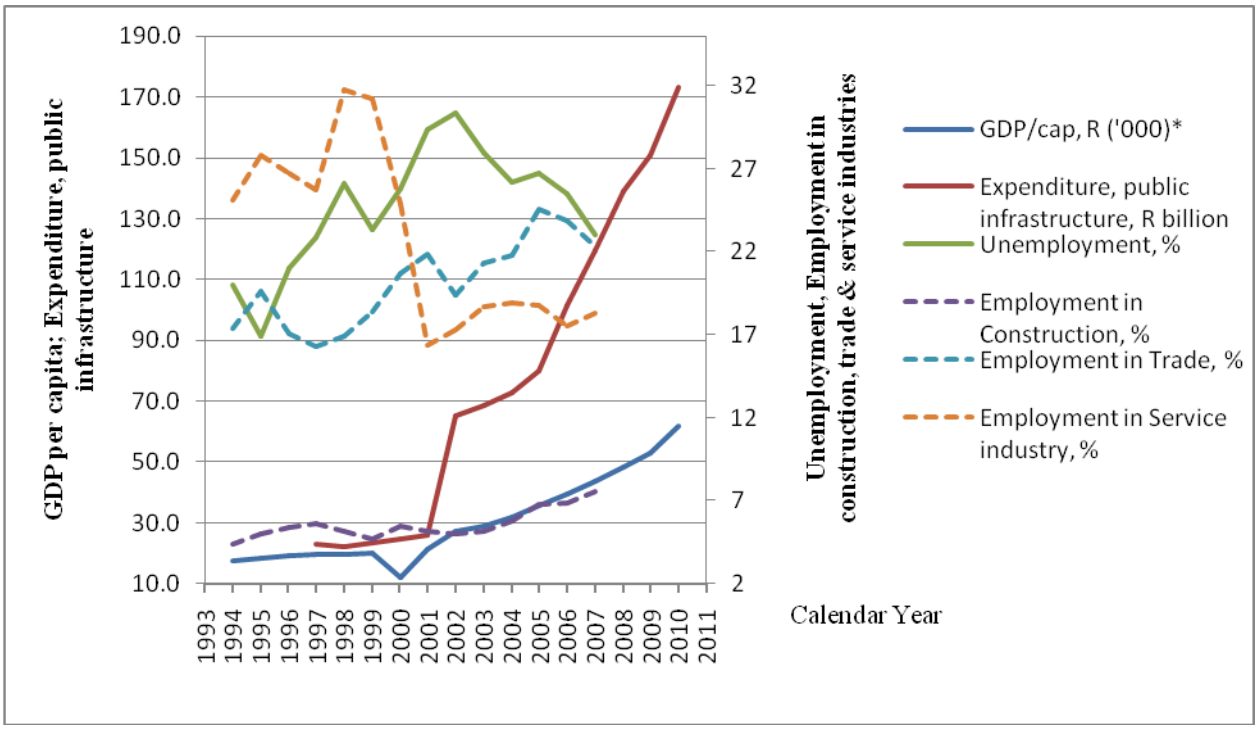


Figure 2.1: Trends in selected RSA economic indicators: GDP per capita; Expenditure on public infrastructure; Unemployment, Employment in selected industries

Equally important, if assumed that the backbone of every country is largely dependent on the number of artisans, engineers, scientists and doctors amongst its citizenry, then the percentage of employment created by the construction industry compared to Trade and Services in Figure 2.1 presents a grave situation worthy of immediate action. Despite government efforts to alleviate poverty (as indicated by increasing expenditure on public infrastructure), unemployment is persistently high.

As noted by Yoshitomi (ADBI, 2000) the link between economic growth and poverty reduction results from the interplay of forces such as macro-economic policies, institutional and structural reforms in addition to individual capacity development. In dealing with poverty reduction in the Asian communities, Yoshitomi further remarked, *"Absolute poverty has persisted even when economic growth has been rapid"*. Nonetheless, he asserts, *"economic growth that taps the abundant labour supply contributes more to poverty reduction...Thus, economic policies that promote high*

returns to labour should be encouraged as these have more impact on poverty alleviation".

Though poverty alleviation methods may be country-specific depending on nature and extent, China's effort in overcoming rural poverty is exemplary by any standard, as reported by the World Bank (2001a). Integrated developmental approach comprising agriculture, social and basic physical infrastructure (such as water and sanitation, roads and power supply) was adopted. Accordingly, China was able to sustainably reduce absolute poverty from over 30% to less than 5% over a period of two decades since 1978. The duration involved strongly suggests programme approach instead of project-based approach to poverty alleviation. Several factors worthy of emulation by other developing countries have significantly contributed to this remarkable achievement, mainly strong government commitment to and financial support for the poverty reduction programme. China's achievement may hold lessons for other developing countries struggling in their poverty reduction efforts.

According to the World Bank evaluation report (2001a), the key is efficient and effective allocation of available funding for poverty reduction prompted by effective targeting of the needy. This calls for efficient public financial management, coordination and accountability. Lack of appropriate financial controls translated as business as usual, reveals itself in misallocation of poverty alleviation funds with poor quality of work. Another lesson deriving from the Chinese experience was that in relation to rural enterprise development, it is better for governments to provide an enabling environment for businesses to thrive instead of direct financial intervention. China tried to provide direct funding for rural business set-ups but only had mixed results. For improved poverty reduction results, the World Bank suggested broader community participation and the introduction of Public-Private Partnership (P-P-P) in infrastructure procurement.

Following the World Bank's recommendations, China experimented with Build-Operate-Transfer contracts for three pilot infrastructure projects but failed to yield

good results (Bellier and Zhou, 2003). Other forms of P-P-P were therefore explored. These were preceded by appropriate and extensive policy reforms regarding infrastructure delivery.

Two paramount and additional success factors for poverty reduction were employed: the ability to attract foreign and local direct investments in infrastructure; and political will to take the leading role in fighting poverty instead of high reliance on aid. The Chinese government contributes more than ninety (90) percent of investments in poverty alleviation infrastructure programmes (Bellier and Zhou, 2003). However, for broader participation, the following recommendations were advanced by the World Bank:

- strengthening of legal and regulatory framework, and institutional capacities;
- efficient risk allocation between public and private parties, and effective management of allocated risks;
- creating an enabling environment for domestic banks to play a significant role in financing infrastructure projects;

In relation to technology for infrastructure delivery, far-reaching implications may be drawn from conclusions made by the World Bank (1986b), Howe (1995) and Public Service Commission (2007:25). *It is technically feasible and financially viable to use the abundant labour of the poor to provide the needed basic infrastructure with the potential for significant increase in employment per unit of expenditure,* provided certain pertinent principles are pursued. Their main construct may be summarised as follows: given that the government is the principal funding agent of public infrastructure projects (about 60 to 80%), procurement policies should be amended or reformulated to engage the poor in productive employment through innovative delivery methods where technically feasible.

Though not a panacea, employment-intensive delivery methods can significantly contribute towards poverty alleviation if adequately planned and managed. Thus, economic growth and any intervention for poverty reduction not based on productive

employment of the poor via a programme approach are bound to have insignificant effect in alleviating poverty. Such initiatives at best can only massage the pain momentarily by throwing resources at the problem and ensure perpetual entrapment in the poverty cycle.

Based on experience and research in the field of employment creation through basic infrastructure provision, McCutcheon codified the reasons for success into principles of employment-intensive construction (McCutcheon and Marshall, 1998:17-19). These are as follows:

- *The projects must be treated as proper engineering while giving serious consideration to social benefits besides the product itself.*

- *The type of work must be appropriate to employment-intensive methods*

- *Detailed technical analysis must be carried out.*

- *Design, specifications and documentation should be appropriate.*

- *During pilot projects method and work-studies should be carried out,*

  iteratively, to reveal:
  - the various operations and optimal sequencing of such operations;
  - the various activities within each operation;
  - the individual and group tasks appropriate to the activities and operations; and
  - the balancing of the work forces required for activities and operations.

- *Conditions of employment must be appropriate.*

- *"A fair day's wage for a fair day's work", or: no work, no pay*

- *The labourers make their own way to work: transport to site is their responsibility.*

- *Training must be extensive and good at what it sets out to do: particular attention must be paid to site supervisors and multi-site supervisors*

- *The labourers must accept instructions given by trained road builders*

- *There should be close liaison between site work and the local community; but liaison must not be the responsibility of the site supervisor.*

- *Sites must be well organised.*

- *Strong organisations are required with good management systems.*

- *The subject must not be treated as emergency relief.*

The above principles constitute a good reference point for evaluating any labour-intensive programme. In particular, most labour-intensive programmes fail because they ignore such principles and treat them like emergency relief programmes that can hardly reduce poverty.

Equally, research shows that a long-term programme approach (as opposed to ad-hoc project-based approach) yields better results in terms of poverty alleviation and skills development (McCutcheon, 1995:348-349; McCutcheon and Marshall, 1998:47). Programme approach to infrastructure development for poverty reduction allows sufficient lead-in time for good early preparation including training and development. Accordingly, McCutcheon postulated a four phased approach for setting up new national programmes. This has been tried and tested in several successful programmes; and together with the principles of employment-intensive construction they form a

complementary evaluation tool for assessing the performance of large-scale infrastructure development programmes. It consists of

(i) Feasibility, analysis, orientation and education.
(ii) Preparatory work, analysis and design.
(iii)Pilot / initial training.
(iv)Expanded training leading to large programme.

This approach has to be located within an institutional framework: national, regional, provincial, local. During the "lead-in" period Phases 1-3 are carried out. The careful pilot-demonstration work contains embryonic training programmes.

In the Fourth Phase the training programmes within each sub-sector would be expanded into a large programme.

Phase One

Education and agreement at national, provincial and local levels as to:

(i) Concepts and Objectives: asset creation plus significant additional employment creation opportunities per unit of expenditure;
(ii) Nature of long-term "programmes";
(iii) Condition of employment, wages and linking of payment to production.

- Brief local and national authorities as to type, standard, funding and method of construction; the importance of training, institution (local and national)

- long-term political support and financial commitment
- Agreement that labour-intensive public works programmes are not emergency or drought relief projects

- Draft long-term programmes

Phase Two

Analysis: *institution (local and national); organisation; levels of funding; specific technical analyses; criteria for staff recruitment; identification of initial communities and training sites*

Preparatory work: *design, specification, documentation; administrative, technical and training manuals; selection of trainees; briefing of communities; priorities*

Revise forward plans.

Phase Three

(i) Orientation and training of trainers;
(ii) Start pilot projects and embryonic programmes;

(iii)Revise training and large-scale programmes;
(iv)Revise manuals and reporting systems prior to initiation of large-scale programmes.

Phase Four

Expand initial training programmes within each sub-sector into a large-scale programme. But the expansion should only be allowed to proceed in the following manner:

(i) At the rate at which the training programme can produce skilled site supervisors, multi-site supervisors, clerks, artisans and engineers (training must pay as much attention to character as technical competence).

(ii) To the degree to which local communities have the capacity to absorb the trained personnel.

(iii) To the degree to which the responsible institution is able to absorb the trained management personnel and maintain its overall role in relation to planning, co-ordinating, monitoring and evaluation.

Despite the body of knowledge in poverty alleviation through labour-intensive infrastructure provision, several attempts made in both pre- and post- 1994 South Africa have all yielded mixed results. Typical examples were the National Public Works Programme and Community Based Public Works Programme, Reconstruction and Development Programme, Special Employment Programme; and recently the Expanded Public Works Programme. Notwithstanding the socio-economic problems (typically unemployment, poverty, huge basic infrastructure backlog and skills deficit) South Africa has hitherto failed in implementing a successful national employment-intensive programme similar to experiences in Kenya and elsewhere. What are the reasons behind this lack of *replication*? What are the knowledge gaps in the development field that South Africa needs to internalise in order to run successful national employment-intensive programmes? Can mega-industrial projects overseas hold promises for the way ahead?

Therefore in order to understand and investigate research questions raised in the introductory chapter, the review of literature has been structured to explore the

following issues: reasons accounting for the under-performance of most anti-poverty infrastructure development programmes; delivery mechanisms; initiatives in South Africa; control measures and contemporary issues and challenges; description and analyses of two mega-industrial projects, namely: the Alaska Oil Pipeline project in the 1970s and the Channel-Tunnel rapid rail link between UK and France, and elements of good practices and tools for improving programme performance.

2.2 Impact of Infrastructure Development Programmes on Poverty Alleviation

Physical infrastructure is fundamental to the viability of every society and often its development is planned to meet certain social and economic objectives. However, the poor in several developing countries often lack access to basic infrastructure such as potable water, housing, health facilities, transportation network, among other needs. In the creation of wealth, JF Kennedy once remarked, *"our wealth did not create our transport infrastructure; it is our transport infrastructure which created our wealth"* (Rupprecht, 2009).[3] The validity of this statement arguably depends on which of the two is the dependent variable. But the essence of his assertion is that efficient, adequate and well-managed infrastructure is central to the social and economic health of every country and community.

Supported by appropriate but sound government policies and strategic implementation plan, infrastructure stock becomes the foundation upon which a country's superstructures like economic growth and development rest. Though difficult to establish causality, good planning and management fosters an excellent link between infrastructure stock and the strength of the economy (World Bank, 1994). Accordingly, one percent increase in infrastructure stock is associated with an equivalent increase in Gross Domestic Product. Good infrastructure planning and management is indispensable in poverty reduction, and yields the expected dividend given the right enabling environment for its design, construction and operation.

[3] Rupprecht is the Director General of International Roads Federation, IRF, Geneva.

The past four-decades have been marked by an upsurge in infrastructure developments in developing countries with the over-arching objective of improving prevailing socio-economic conditions of the poor. Performance, however, is not commensurate with the increased level of investments.

2.2.1 Reasons underlying non-performance of most development initiatives

Several attempts made by various governments via the development of basic infrastructure to help alleviate poverty have failed to yield expected results and impacts. Reasons accounting for this dismal performance vary. These may be discussed under five broad headings as follows: (i) inadequate project design including preparation; (ii) Complexity of the project or programme environment; (iii) Technical inadequacies; (iv) Institutional challenges; and (v) Other project management related issues. The technical and institutional challenges and other management problems add to the complexity of the programme environment. They are therefore captured under reason itemised number (ii).

(i) Inadequate preparation and project design

According to Paul (1983*), "By far, the greatest number of failures to carry out public sector projects and programmes at reasonable cost in reasonable periods of time are traceable to inadequate project selection and preparation".* Often because of the political cycle and pressure, project / programme planners and implementers do not accord development efforts the deserved timeframe for pre-feasibility studies to test the potential benefits of programmes perceived. Consequently projects are ill-conceived and with ill-defined objectives.

Most of these objectives are over-ambitious, lacked clarity, intangible, and where tangible no verifiable indicators of success are provided to measure them. Poor project definition is accompanied by late scope changes with ripple effects on construction time and costs (Rogers, 2006) because these changes are often made by clients usually

with no commensurate effort in terms of additional budget and time allocations. In addition, timeframes for implementation are frequently unrealistic. Objectives as hypothesised by AUSAID (2000) ought to be specific, measurable, achievable, realistic, and time bound. Social objective components of development programmes are important though difficult to evaluate. However, there should be documented criteria of success to measure programme effectiveness (World Bank 1999; Howe, 2001).

Lack of adequate preparation has characterised most failed mega industrial projects and infrastructure development programmes carried out in developing countries (Rogers, 2006). Given the apparent lack of skills in many countries, training must form an integral component of every infrastructure programme with the view of concrete and relevant skills transfer. However, not infrequently, the timescale is too short; there is no lead-in time for training of programme workers on the field. Therefore, successful large-scale programmes, amongst other things, require what is termed as prefeasibility studies or early-preparatory activity by Rogers (2006).

Top-down approach to decision-making characterise most programmes. Community participation is reduced to consultation concerning already-made development decisions thereby unable to tap the needed spin-offs of meaningful engagement with programme beneficiaries (Abbott, 1994). In addition, lack of accurate identification of programme stakeholders and absence of effective management usually results in unanticipated problems that tend to retard progress, increase project costs, and drastically reduce or dilute projected programme benefits (Cleland, 1999; Turner, 1999).

Thus, many elements of good programme preparation are ignored because of insufficient time and resources. However, piloting plays a crucial role in development programmes due to the unfamiliar landscapes that most initiatives find themselves. In an era where resources are scarce prompting their sustainable usage, pilot projects become indispensable. Paul (1993) asserts that pilot projects are perfect for testing a

variety of implementation strategies and to ascertain the appropriate scale and scope of the intended programme. In several sub-Saharan labour-intensive programmes implemented during the 1980s, pilot projects were used to great effect for capacity building and training, estimating productivity figures and work schedules.

Pilot projects as precursors to actual programmes are implemented during the initial phases along the programme cycle in order to assist sponsors and managers ascertain the technical, economic, financial and economic viability and institutional feasibility of intended large-scale programmes. Essentially piloting is needed to fine tune programme objectives and appraise requisite resources for successful implementation (Picciotto and Weaving, 1994). Pilot programmes are critical for the following reasons.[4] They:

- explore alternatives identified at the preparation phase (of development programmes) and objectively assess risks followed by good risk management planning and effective implementation. Programme risks are thereby reduced to the minimum to enhance project success when replicated on large scale;

- test local leadership and provide information about the development operations and activities expected to be replicated during mainstreaming of programme;

- can be funded without elaborate internal review processes, thus reducing the time needed to start programme activities;

- allow the training and development of institutional capacities and professional competencies – technical, financial, and managerial – required to plan, implement and manage the programmes;

[4] Picciotto, R and Weaving, R. 1994. "A New Project Cycle for the World Bank?" Finance and Development. December 1994

- facilitate setting of realistic objectives taking cognisance of programme constraints.

Void of understanding of these basic concepts of poverty alleviation and community or public infrastructure development, politicians often rush into implementation (*to crash the programmes)* in order to save money and time from adequate design. Partly, the problem is the apparent inability on the part of politicians to separate short-term relief or emergency projects from development programmes. The result is that problems are encountered during the implementation stage proving the exercise to be a false economy; and to quote Rogers (2006),[5] *"The primary thing you can do to guarantee difficulty in a project of this magnitude is to try to accelerate the schedule".* Studies indicate that for a new infrastructure development programme, the timeframe for implementation should be approximately the same for good planning and design of normal projects.[6]

(i) Complexity of the project or programme environment

The main object of project management is to deliver a completed project which complies with client's objectives – project must be delivered on time, within budget and to specification as stipulated by the client (Meredith and Mantel, 2003:1). Because every project is unique, performance is difficult to predict. This uncertainty gives rise to risk and opportunities, the intensity depending on the scale and size of the project or programme. Thus, project environment (including the socio-economic context) plays a significant role in determining the outcome. Despite the commonalities in requisite skills for managing projects or programmes in both developed and developing

[5] Dr. Al Rogers has over ten years experience with Virginia-based Independent Project Analysis on mega industrial projects, and had the task under a U.S. government contract of identifying the drivers of those unsuccessful outcomes for 1980s projects.

[6] Wideman, R. Max. 2001. Project Management – Simple Answers to Simple Questions. AEW Services, Vancouver, BC, Canada. http//www.maxwideman.com/papers. He was past president and Chairman of Project Management Institute, and developed the 1987 Version of the Project Management Body of Knowledge

countries, the unfavourable environment in developing countries adds to the complexity of undertaking such endeavours in the latter.

The complexity of the programme environment in developing areas stems from a variety of factors. First, political instability and unpredictable market conditions make it difficult to determine policy directions and project economics. Financial constraints and cash-flow problems, probably because of lack of due diligence to economics, often result in project and/or programme underperformance and abandonment. Infrastructure development programmes require adequate financial commitment.

Second, socio-economic conditions (such as poverty and uncertainty of project cost recovery, high unemployment, shortage of technical skills and huge infrastructure backlogs) introduce additional risks. Equally, cost-recovery efforts for such costly interventions may be diluted due to the high incidence of poverty, unemployment and potential for corrupt procurement practices. Without sufficient cost recovery, therefore, managing the constructed infrastructure (especially with respect to maintenance issues) becomes difficult – programme sustainability and potential impacts would be negligible. The project environment is further weakened by the general lack of institutional and individual capacities to plan, design and implement development programmes. In effect, objectives are either ill-defined, too many or unrealistic, making it difficult to conduct meaningful evaluation. Thus, successful implementation of development programmes demands that sufficient lead-in time is allocated for training and development of capacities at national, provincial, local and individual levels.

Third, inadequate stakeholder management is a common phenomenon in managing projects in developing areas; Rogers (2006) describes it as a serious flaw in planning mega industrial projects because of the probable costly risk of time delay during implementation. Due to the widespread poverty/ unemployment, there is a high tendency for promotion of personal interests by some of the main programme participants during the planning process. Another dimension to the complexity of managing programmes in developing countries is the constantly changing demands of

the Trade Unions. The problem is that their influence is often ignored, downplayed or disregarded. Consequently, programmes could be disrupted or negatively influenced resulting in time overruns and additional costs. The above discussion underscores the importance of community participation and pre-feasibility studies to ensure that concerns of all potential stakeholders are firmly addressed before commitment of resources.

Fourth, lack of ownership necessitates that programmes are planned with the target group and relevant stakeholders as opposed to the reversed situation in developed countries (Picciotto and Weaving, 1994). The process would foster commitment, enable a pre-feasibility report to be compiled, and also address the capacity issues and participatory method of planning and construction is therefore perceived as an essential ingredient to success of development programmes in developing countries (World Bank, 1996a).[7]

The above discussion shows that the project environment in developing countries is unique and therefore demands, in order to guarantee success, a carefully planned approach to sort out the financial, institutional and technical inadequacies. Given the enormity of the socio-economic problems, a project-approach to help improve the situation would make little impact. As institution building takes time, so the overall lead-in-time for good preparation of a programme-based approach produces tangible results.

The unsatisfactory general performance of current labour-intensive construction programmes calls into question the delivery method. It was envisaged that abolishing the inefficiencies inherent in the use of in-house capacity (force account system) in favour of small-contracting system, more employment could be generated cost-effectively. However, the switch has not been effective and rewarding (in terms of success, employment creation and poverty reduction) as expected (Bentall, Beusch and

[7] World Bank, (1996a). The World Bank Participation Sourcebook. The World Bank, Washington, D.C. (Feb. 1996)

de Veen, 1999). In some countries, either the new system is aborted in preference for the traditional way of doing things or implemented concurrently with the force-account system. Are there merits inherent in each system? Why is the contracting approach not working as expected?

2.3 Delivery Mechanisms of Physical Infrastructure

Until the mid-1980s, public infrastructure in developing countries (including utilities, public works services, and transportation) was the domain of specialised construction units located within various Public Works Departments. The traditional method of delivery was the use of in-house capacity, dubbed the force-account system. Prevailing socio-economic conditions, however, determine the type of physical infrastructure to be constructed. Whereas major civil engineering works were undertaken in several countries a century ago, current conditions have necessitated the need and demand for basic infrastructure such as water and sanitation, housing, rural and residential roads, and storm-water (Bozzoli, 1997). Contemporary socio-economic needs together with capacity challenges have witnessed a paradigm shift from the traditional method of delivery to outsourcing through the use of emerging contractors. The next section makes a comparison of the two methods of infrastructure delivery for poverty alleviation, as well as the issues and problems.

2.3.1 Comparison of force- account system with outsourcing for infrastructure provision: issues and problems

Essentially this section investigates the merits and associated problems of the traditional and modern methods of providing basic infrastructure, the context within which local small-contractor approach was developed in South Africa and general performance.

The construction industry forms a significant proportion of the economy with the size ranging from 40 to 60 billion Rand per annum; current government infrastructure

spending is over 300 billion (Dison, 2008; CIDB, 2007). The potential contribution of the construction industry to poverty alleviation and employment creation is unquestionable (ILO, 2001; Dison, 2008).

Under the force-account system of infrastructure delivery, workers gradually became permanent employees, enjoyed fringe benefits, and were pensionable. The employer was the main risk-bearer. Project planning, design, implementation, operation and maintenance were done using in-house capacity; there was therefore quick response to emergencies or natural disasters.

The change from this system of delivery to outsourcing/ contracting has been orchestrated by several factors, namely: inefficiencies and corrupt payroll practices associated with the force-account system; the need to address the high levels of unemployment; technical skills deficit; and the huge infrastructure backlogs. If properly implemented, the contracting approach has several advantages like (i) reduced risk for the client; (ii) higher, productive employment generation through labour-intensive engineering; and (iii) broadening of the skill-base in the construction industry for rapid rural development. However, mixed performance under the small contractor development system (for example lack of delivery and high failure rates) has provoked division among decision-makers, researchers and developer (Jennings, 2007). In some instances, absence of professional ethics – such as corrupt procurement practices that puts strain on the already inadequate funding – has brought many contractor development programmes to disrepute.

Problems with the contracting system may be client-related, technical inefficiencies on the part of the small contractors, industry-related, and or unfavourable environment to help the system to succeed (Petts et al, 2006: 26-27; Tajgman and de Veen, 1998:20). In South Africa, for example, experience indicates a dismal success rate: 80% of small-emerging contractors trained fail within 15 months; of the remaining 20% only 7% last

more than 5 years; therefore only 1.4% of those who start succeed for more than five years.[8]

Client-related problems comprise 'non-delivery", capacity issues; and lack of guaranteed contracts to develop and thrive in the industry. Probably for better understanding of the problem, the starting point would be to trace the history and development of the small-contracting fraternity.

Although several forms of contract exist in South Africa for delivery of public infrastructure, the most commonly used is based on the three-party system namely: legal agreement between the Client (who is employer); Consultant (client's representative); and the Contractor (Dison, 2005). The *triarchy* system requires that, the client pays; the consultant plans and designs, while the contractor constructs the intended infrastructure. The contractual arrangement is depicted by Figure 2.2 whereby the client has a contract with both the consultant and contractor (but no legal contract between the last two parties, except communication). In addition, the consultant and contractor have representatives on site to ensure project delivery. Under this arrangement, clear roles and responsibilities to ensure sound delivery are defined by the basic assumption that each party has acquired sufficient capacity (technical, institutional, financial, administrative, managerial, leadership and legal understanding) to execute its contractual obligation satisfactorily. Any weakness in the link would therefore be catastrophic for project or programme implementation.

[8] SAFCEC performance analysis of small, emerging contractors in South Africa between 2003/2004. Egbeonu, E (2004) An appraisal of mentorship within the black prime contractor component of the emerging contractor development programme of South Africa. Johannebsurg: University of the Witwatwersrand, MSc (Eng) Thesis.

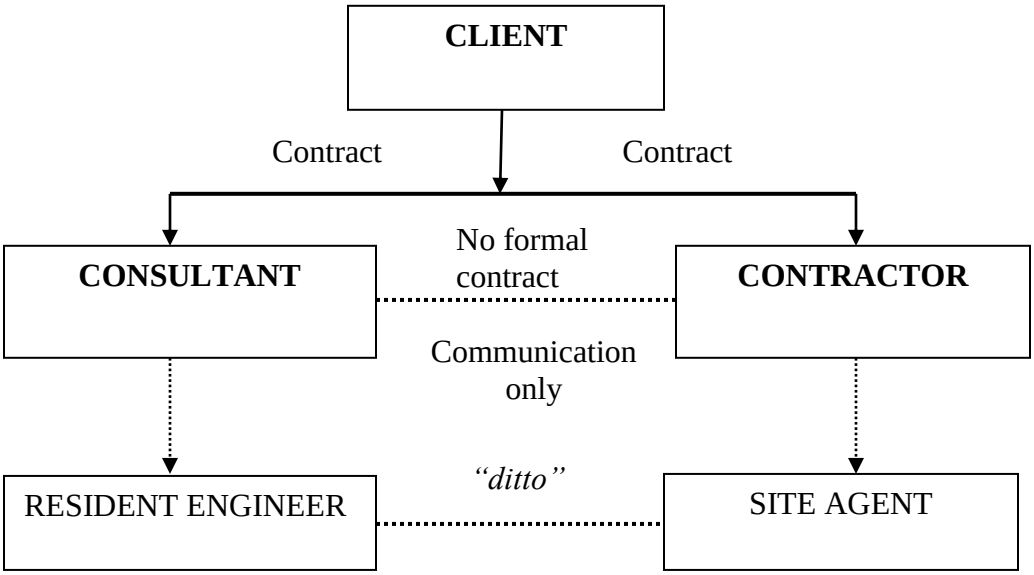


Figure 2.2 Contractual arrangement between main stakeholders in the construction industry
Source: Dison, 2005

Before 1994 in South Africa, there were about seventeen construction units within the National Public Works Department for the execution of municipal infrastructure and service delivery (Dison, 2005). However, the National Public Works Department was split into one national and many provincial Departments of Public Works and most capacity was stripped out. These Departments of Public Works are now responsible for maintenance of public buildings and not much else. At the same time, the advent of an all-inclusive government – which brought all former homelands under one central regime – ushered in a new reality of huge infrastructure backlogs, the need for housing and other essential services, lack of technical skills due to low level of education, high unemployment levels and the need to develop rural communities. Given these realities and the need to broaden the economic base of the country and alleviate the skills deficit problem, the government moved to the development of small-emerging contractors for

providing basic infrastructure needs through the use of labour-intensive construction methods. The innovative technology is context appropriate – given the prevailing socio-economic conditions – but is supervision-intensive, and requires political commitment to succeed (Coukis, 1983). With gross shortages of skills at national, provincial, municipal and individual levels, the result is inability to meet demand, coupled with inadequate contract administration and management (Stiedl and Tajgman, 2003; Taylor, 1996). Lack of service delivery has become a common phenomenon – public dissatisfaction expressed through mass street demonstrations. Furthermore, lack of commitment in terms of ensuring adequate jobs (contracts) for the small emerging contractors to develop is a serious setback. In particular, infrastructure implementation policy (including training needs) seems not to have been well-communicated: general lack of communication and coordination among various levels of government exist (Dison, 2005). Arguably, these systemic inadequacies question the readiness of South Africa in particular (and developing countries in general) to implement successful small-contractor development programmes to alleviate unemployment and develop capacity within the construction industry.

Another major challenge to developing a successful small-contracting industry is the technical inefficiency of the majority of these contractors, symptomatic of the quality and relevance of training received. Perhaps due to the low level of education and weakness in the selection criteria, some small contractors are unable to read and understand construction drawings, conditions of contract and tendering, project specifications; they lack appropriate financial management skills and are unable to meet project deadlines (ibid). Late work or time-overrun translates into cost overrun, and ultimately attracts legal action. The immediate debatable question is who is to blame, the client or the small contractor? Perhaps the developmental history of major, well-celebrated, South African contractors would give a clue to the answer. Today's major contractors nearly all started out as sub-contractors, where they learned contracting skills and gained experience before making the leap to full contractors (Bozzoli, 1997). The paradox is that training is not given the due consideration in several, current, government programmes. Probably in relation to exit strategies, the

issue of serving under major contractors with commensurate government incentives should be seriously considered.

Construction industry related problems also greatly impair the potential contribution from the development of emerging contractors for labour-intensive programmes. First, the industry is dominated by large capital-intensive companies that are able to influence decisions to the detriment of the emerging contractor. Most of the forms of contract used favour the use of plants. Second, the illogical, anecdotal perceptions about labour-intensive construction methods – in relation to cost, time and quality of product – appear to influence political decisions at lower levels of government. Thus taking the socio-economic realities and the proven record of the technology into consideration, much education needs to be done. Third, lack of sustainable work throws doubt on the commitment of the client and ability of the small contractor to succeed. Packaging of work into smaller contracts to accommodate the emerging contractor receives unfavourable response from the construction industry. The argument is that it takes jobs from the major economy which is contrary to the fact that labour-intensive jobs constitute an insignificant proportion of the national construction budget.[9] In addition the industry fails to understand that labour-intensive construction will contribute to build the resource-base for the major economy.

Equally acquiring the necessary finance to purchase small equipment and materials presents another major constraint to develop into successful contractors due to lack of lack of collateral security and credibility. Cash flow problems are compounded by late payment by client, which in turn increases bank cost for interest charges on loans secured (Jennings, 2007).

Thus, despite the potential gains in adopting contracting approach, lack of demonstrable client commitment, systemic problems and capacity issues continue to hamper progress and infrastructure delivery. In addition, research shows that despite

[9] Croswell, J. (2004-2005). Series of Postgraduate Lectures on Employment Creation in Construction and Maintenance of Physical Infrastructure. School of Civil and Environmental Engineering, University of the Witwatersrand, South Africa.

the potential benefits of labour-intensive construction, there is apparent lack of institutional commitment to use the method (Howe, 2001:3).

2.4 Evaluation of Labour-intensive Infrastructure Development Programmes

The goal of labour-intensive infrastructure programmes is to improve the poor living conditions of target groups (Hauge, 2001). In this context, the conditions that must be improved are the high level of poverty, unemployment, lack of employable skills, and lack of access to basic infrastructure (ILO, 2007:2). Thus, assessment of labour-intensive programmes encompasses primarily social, economic and technical issues. These are both quantifiable (and therefore easy to measure and evaluate) and intangible, and consequently difficult to assess performance.

Although costly and time-consuming, evaluation serves a useful purpose as a learning tool to improve performance and policy formulation, and equally accountability and public confidence building (Hauge, 2001:2; World Bank, 2007:16). This section investigates various evaluation approaches and processes of collecting, analysing, reporting and using data. It ends up by discussing current issues and challenges affecting the evaluation of infrastructure developments in developing countries.

2.4.1 Evaluation methods and design

Several approaches and tools exist in determining the value of development programmes; the choice depends on several factors including the context (donor-funded or government intervention); nature of governance; intended use of end results; availability of funding; and timeframes. Traditionally, effectiveness and efficiency had been the focus of evaluation in development programmes (World Bank, 2007:301). For instance, government-funded projects may only concentrate on the efficiency and effectiveness of various interventions, and for this, internal and/or independent evaluation would suffice. However, for donor-funded programmes additional information on policy instruments and institutional framework may be demanded in order to make informed decision for further funding.

Moreover, factors such as multiple sources of funding; the need for results; lack of ownership of projects; lack of capacity and bad governance have introduced an increasing shift towards participatory approaches for evaluating development programmes (World Bank, 2004c:16; Hague, 2001:vii). Despite the advantages, participatory evaluation has its own problems and challenges in terms of cost, timeframe and capacity issues (World Bank, 2004c:16; 2007:312).

Evaluation design uses various tools to collect, analyse, and report results; these include the Logical Framework approach, Rapid Appraisal Methods and other participatory approaches. Each has its own strengths and shortcomings (UNDP, 2002:132; World Bank, 2004c; IFC/GTZ/DFID, 2008:34). However, evaluation design for labour- intensive infrastructure should be context-specific taking into consideration the theory and principles as well as the four-phased approach for programme implementation postulated by McCutcheon (in McCutcheon and Marshall, 1998). One immediate question is does the Government have the necessary capacity to conduct evaluation of far-reaching implications? In addition, does political will and commitment exist to conduct evaluation that is objective enough to improve programme results and policy?

2.4.2 Contemporary issues and challenges in evaluation

Notwithstanding the advantages of institutionalising evaluation as an integral component of interventions, the benefits thereof seem not to have been internalised by decision-makers. Several country-level, employment-intensive programmes are not evaluated; and if evaluation takes place, it is often influenced to satisfy political goals (Hauge, 2001:vii). Thus, results may not be objective, reflecting the dynamics on the ground; thereby defeating the very purpose of evaluation. Coupled with this, it demonstrates lack of political will and commitment to institutionalise evaluation. This raises concern about the level of accountability, governance and the preparedness to deal effectively with the socio-economic problems in respective countries. For good

evaluation that informs future policy and decision-making, and helps in performance improvements, essential ingredients are that it should be relevant, objective and completely insulated from political interference.

Another formidable challenge is the capacity to evaluate development programmes. Often evaluators are not well-informed or do not have appropriate skills to conduct effective evaluation. Consequently, irrelevant indicators are used in assessing programme performance which renders evaluation a fruitless exercise. For instance, how to evaluate social (intangible) objectives is problematic to many decision-makers and programme implementers because no specific indicators of measurement are stipulated. For example, the frequently stated objective – targeting the *poorest of the poor* is difficult to evaluate without concrete definition and appropriate indicators. The problem points to lack of evaluation capacity. On the same note, some of the tools used for data collection and analysis are complex to interested parties. Thus, education and training in evaluation methodologies become crucial for participants in any evaluation exercise. Institutionalising evaluation would exert pressure on decision-makers and programme implementers to build and strengthen evaluation capability.

In addition, several development programmes or government interventions are difficult to evaluate for various reasons. Frequently, objectives are ill-defined (Thwala, 2000; 2005; 2006; 2007:7) and thus performance indicators are either inadequately specified or not stated due to lack of consensus among decision-makers. Equally, although technical objectives in labour-intensive infrastructure programmes are as important as the socio-economic goals, they are not given due consideration, resulting in poor quality of product or huge maintenance backlogs (Howe, 1999:11-16).

Evaluation needs reliable, relevant, and well-documented data to measure the worth of programme interventions and also account for the use of money and programme resources. However, often government institutions are reluctant to supply accurate data, thus making recording and reporting of data extremely difficult. Similarly, poor programme planning results in unnecessary volume of data collection that adds to programme costs and affects other field operations. These lead to increased cost, poor

processing, misinterpretation of programme results, and ultimately biased evaluation results.

Other problems in evaluation include (i) setting of unrealistic timeframes to conduct evaluation probably due to resource constraints or lack of adequate planning; and (ii) inadequate resource allocations for evaluation. Together, these problems are indicative of lack of commitment, understanding of evaluation methods and processes, or lack of sufficient skills to undertake the exercise.

In sum, evaluation should be institutionalised as part of every infrastructure development programme because of the benefits to future endeavours as well as policy and accountability. If institutionalised, it would encourage governments to build the necessary capacity for assessing and improving programme performance.

Section 2.5 gives a brief summary of labour-intensive infrastructure programmes undertaken in South Africa, their performance and impacts (detailed analysis and discussion is provided in chapter 9).

2.5 Development Impact of Infrastructure Provision in South Africa: Past and Present

Several large scale infrastructure programmes have been implemented in South Africa before 1994 and after 1994 when an all-inclusive government was formed. The overriding goal was to improve the living conditions of the poor by generating employment opportunities, providing access to basic infrastructure and employable skills (McCord, 2003:6-8; Department of Transport, 2005:97). However, performance was substantially mixed (Rogerson, 2004:781-782) and, in many instances projects either failed to achieve the intended objectives (Holicki and Tladinyane, 2000: 23) or to reach the targeted beneficiaries. In sum, both past and present projects undertaken have in general failed to alleviate the socio-economic problems highlighted above (Public Service Commission, 2007:25-29). Comparison of South Africa to several

developing countries reveals a paradox: unlike many developing countries that rely heavily upon donor funding, South Africa has got money. The immediate question is if the *have-not* countries have been able to embark upon successful mega infrastructure programmes for poverty alleviation, why is South Africa unable to do so?

Analysis indicates that several factors contribute to the unsatisfactory performance of initiatives undertaken so far in South Africa. They range from lack of understanding of development issues, capacity problems, ill-defined and too many objectives, to inadequate early preparation for programme/project implementation. In addition, the inferences are that policies are ill-communicated and therefore unable to secure the necessary commitment at lower tiers of government. Equally, policies are often implemented without careful analysis of the required resources and capacity to deliver.

2.6 Whither Development Programmes? Lessons for South Africa

Analysis of South Africa's inability to implement successful national employment-intensive programmes demonstrates several challenges. These problems relate more to capacity constraints, planning and management flaws, and not to financial constraints. This section investigates the challenges in South Africa, discusses the institutional capacity issues and draws some lessons from large-scale industrial projects.

2.6.1 Challenges confronting development programmes

Since 1994, requests for funding to undertake infrastructure programmes in several Provinces have not been matched by implementation results (Public Service Commission, 2007). A common phenomenon has been inability to spend money allocations; consequently funds provided have to be carried forward to the next financial year, a term known in South Africa as *budget roll-over.* As a result, intended programme benefits are never realised by targeted beneficiaries. Underlying reasons for this issue include the following:

(i) Lack of institutional capacity at all tiers of government to plan and implement indentified programmes; inability to embark on strategic training and development initiatives to address the problem;

(ii) Inability of decision-makers and programme implementers at various levels of government to pursue a single coherent policy regarding poverty alleviation through infrastructure development programmes;

(iii) Lack of realistic employment policy that adequately addresses the unemployment-poverty circle;

(iv) Tendency to seek short-term, ad-hoc, project-based solutions to endemic socio-economic problems, instead of well-thought-out long-term development programmes;

(v) Predisposition by decision-makers to rush into programme implementation at the expense of adequate planning and design;

(vi) Lack of political will and commitment to poverty reduction, refusal to institutionalise monitoring and evaluation, and inability to learn from past programmes;

(vii) *Casualisation* of labour and inadequate definition of what constitutes a "job". This has little impact on poverty reduction.

In relation to large-scale *programmes* the Public Service Commission report (2007), concluded that the government does not have sufficient capacity to undertake programmes of such magnitude. Decentralisation of programmes therefore carries another risk in South Africa: absence of suitably qualified and experience personnel to plan and undertake projects. What is the government doing about the situation? In the Expanded Public Works Programme, for example, policy states that training should be provided to all participants. However, research shows that either the training does not take place at all or if provided, it is not relevant to the work on the ground (Ibid). The succeeding section discusses the capacity issue and offers suggestions about the way forward.

2.6.2 Institutional Capacity Development and Knowledge Management

Capacity building at individual levels and all tiers of government demands absolute commitment since effective training and development is time-consuming and costly but rewarding. However, the South African apprenticeship culture has collapsed. According to a report published in the Financial Mail in 2007,[10] artisan training (for example) has progressively reduced to less than 5% (approximately three decades after 1975). Equally, the collapse of South Africa's apprenticeship culture (Financial Mail, 2007) and the ESKOM's recent difficulty in attracting individuals with the right capacity and know-how to resolve the country's *load-shedding* problem make it worthwhile to attach significant importance to capacity building and management of knowledge in the public sector. In addition, given that the backbone of every country depends heavily on the artisans, engineers, architects and related professionals, doctors, and teachers in the country, any lack of seriousness to train and develop these could have undesirable consequences for development in general.

Apart from the South Africa's past non-inclusive policy, which contributed to the shortage of skills due to importation of skilled personnel at the expense of growing its own, the post-1994 actions have worsened the situation. From the corporate world, economic reasons have triggered downsizing or retrenchments which according to Davenport and Prusak (1998) lead to loss of best practices and vital information. In addition, retirements, high employee turnover, greater use of casual workers, all contribute to knowledge loss (Beazley, Boenisch and Harden, 2002).

Other factors contributing to the capacity problem are:

(i) Lack of commitment from decision makers and programme implementers;
(ii) Young people find years of apprenticeship burdensome though that is the traditional route for transfer of knowledge;

[10] Financial Mail, 2007. According to the report, Statistics on artisan training shows a dramatic decrease from 33000 apprentices in 1975 to 1440 in 2005.

(iii) Lack of incentives to encourage the succession process in the public sector.

The foregoing discussion suggests that training, development, and research with commensurate budget form an integral component of every government department. Moreover, for government departments to perform, a critical assessment of personnel with specialised skills leaving as well as entering the organisation should be made on an annual basis together with useful future predictions. This would enable correct determination of capacity needs. Similarly, government should be committed to effectively motivate individuals with specialised expertise and skills (through appropriate incentives) to willingly train potential successors before retirement.

In addition, institutional memory-loss often occurs due to lack of documentation of best practices and core competencies. Several projects undertaken were not systematically documented, and in many instances documents are non-existent. The problem underscores the importance of instituting a culture of recording and reporting (ILO, 2007:6; Rogerson, 2004: 768, 781). Sound training and development must be provided, monitored and evaluated. Essentially it necessitates investigating (i) training requirements; (ii) labour skill requirements; (iii) availability of required labour skills; (iv) change in size of labour force; and (v) inter- and intra-group communication requirements (Meredith and Mantel, 2003:45).

As a complementary effort to training and development within government departments, knowledge must be effectively and efficiently managed, nurtured and improved for future use. Data transformed into useful information becomes knowledge (Drukker, 1998); and must be generated, assessed, codified and transferred (Davenport and Prusak, 1998); this in itself requires training in what to record, and how to process, store and report it.

Beazley et al (2002) define knowledge continuity management as *"the transfer of critical operational knowledge from employees who leave to incumbents or their successors, and is essential to continuous improvement, quality maximisation,*

recurrent innovation and organisational learning." Dixon (1999) in his book about organisational learning cycle, also asserts that *"organisational knowledge grows when it is shared and shrinks when it is hoarded".* These two statements presuppose that there is a need for collaboration between government departments and retired professionals and/or private sector in managing knowledge that is accurate and relevant. Well-codified knowledge is easily obtainable in principle, though in practice, valuable knowledge is difficult to obtain (Boisot, 1998). This implies that government should use appropriate incentives and compelling motivations to effectively engage retired professionals and the private sector in training and developing new, inexperienced middle and senior level managers and employees. For this to take place, Dixon (1999) proposes an environment where there is transparency, respect, clarity in role definition and teamwork.

2.6.3 Mega-industrial programmes: management and implications for development programmes

Introduction

Generally performance of infrastructure development projects has been disappointing due to a number of management-related problems and over politicization (World Bank, 1994). Researchers and development agencies have developed strategies, instruments and good practices (e.g. Logical Framework Analysis, Strategic Management, Community Participation) to help improve project design and performance. Albeit project outcomes are still unsatisfactory: most projects fail to achieve their intended objectives and goals. Can lessons from past and present large-scale projects be incorporated into the design and implementation of development programmes to enhance success rates? This section discusses lessons garnered from management of two large-scale projects: the Channel-Tunnel Rail Link, and the Trans-Alaska Oil Pipeline, and implications for infrastructure development in Developing countries.

Characteristics of Mega-Industrial Projects

Mega-infrastructure projects are complex, technology-driven, large-scale, the scope of which requires huge capital, multi-disciplinary approach, high-level commitment of resources, longer duration with extensive risk and benefits once successful. They draw extensively on adequate planning, good design, strong commitment and sound management principles including effective monitoring to succeed. Lack of strong, competent leadership and commitment contribute significantly to the failure of most large-scale infrastructure programmes (Fawcett, 1985:366-367). Good leadership is required in development programmes to maintain programme vision and effectively manage stakeholders.

Characteristically, common features of such large-scale publicly funded projects include the following (SMEC Holdings, Ltd. 2001):

(i) strong political support and commitment
(ii) unambiguous and clear definition of all project stakeholders' roles, responsibilities and limits of powers
(iii) leadership commitment/ project champion to ensure commitment to succeed
(iv) adequate feasibility analysis and good planning horizon
(v) substantial funding and efficient financial arrangement
(vi) sound institutional capacity (size and quality of institutional capacity determines the success of mega-projects)
(vii) commitment of adequate resources
(viii) broad-base consultation and participation to secure commitment of all relevant stakeholders
(ix) multidisciplinary, strong project team with shared objectives
(x) effective project-integration skills
(xi) efficient supply-chain management and partnering
(xii) adequate financial planning and analysis
(xiii) level of risk is proportional to project size, scale and complexity

(xiv) better allocation of risks to parties best able to handle, mitigate and manage them

(xv) significant cost escalations: sometimes in the range of 25% to more than 200% (for example, due to delays, underestimations, settlement of contractual disputes)

(xvi) public-private partnership

(xvii) multilateral funding agencies and institutions

Interpretations for cost overruns (and requests for additional funding) are mixed. Reasons range from underestimation to strategic misrepresentation in the planning of mega-industrial projects to justify implementation. In addition, cash inflow is often incorrectly predicted due to use of inaccurate forecasting models to determine the project's viability (Flyvbjerg, 2007:8-10). The resultant effects are misallocation of resources, delays translating into further cost increases, inadequate handling of project risks due to poor identification, and shortfalls in benefits (Ibid: 1-6). Other reasons for the cost escalations, according to Flyvbjerg (2007), may be attributed to the long time planning nature of large-scale projects, complexities in managing the project interfaces, lack of coherence in decision-making and planning, besides inordinate scope changes by clients. This necessitates realistic demand forecasting taking into consideration well-researched assumptions of which Flyvbjerg (2007:11-15) proposes a new but tried and tested predictive tool called the *reference class forecasting*. The strength of the model lies in its degree of transparency, dissemination of vital planning information to all stakeholders and accountability from decision-makers and planners.

In an interview with some leading contractors and employers about key success factors for large-scale projects, the following featured prominently (Hendrickson and Au 1989:2:19):

(i) well defined scope

(ii) extensive early planning

(iii) good leadership, management and first line supervision

(iv) positive client relationship

(v) proper project team chemistry

(vi) quick response to changes

(vii) engineering managers concerned with the total project

In sum, success of mega-industrial projects depends on the availability of the appropriate level of human capital to plan and manage events in addition to allowing enough lead-in time to do good preparation. Equally, there is no quick fix solution to poverty alleviation through infrastructure development since it takes significant period of time to train and develop skills – concepts that should be understood by all decision makers and other programme stakeholders.

Almost the exact opposite of the success factors for large-scale projects, the interviewees named the following as primary factors for failure (Ibid):

(i) ill-defined scope

(ii) poor management

(iii) poor planning

(iv) breakdown in communication between engineering and construction

(v) unrealistic scope, schedules and budgets

(vi) many changes at various stages of progress

(vii) lack of good project control

The above-named negative factors are parallel to most failed poverty alleviation programmes undertaken both in South Africa and elsewhere (McCutcheon and Marshall, 1998).

Despite the frequent cost overruns and time delays associated with several large-scale projects, Hendrickson and Au (1989:1.9) suggest that the problems are more of organisational nature (in terms of social and economic factors) rather than technical. Besides a strong project management leadership, the authors' fundamental requirements for successful large-scale projects include, (i) engineering capacity to provide sufficient expertise to complete the design in time; (ii) trained and experienced supervisors; (iii) properly skilled workers; (iv) efficient procurement system; (v)

adequate local infrastructure stock to support the large workforce during the duration of the project; and (vi) the degree of centralisation and decentralisation in decision-making.

Notwithstanding their own inherent problems, one school of thought is that lessons from mega-industrial projects may be used to improve programme performance in developing areas. Brief case studies are conducted on the Channel-Tunnel Rail Link and the Trans Alaskan Oil Pipeline which took seven years and approximately 70 000 workers to complete.

2.6.3.1 The Channel-Tunnel Project (from UK to France), and the Channel-Tunnel Rail Link (UK)

The Channel-Tunnel

First proposed about two centuries ago but delayed until mid-1980s because of political uncertainties and indecisions (Cleland and Ireland, 2007:142), the Channel-Tunnel – a three-tunnel underground rapid rail system totalling 51.5 kilometres linking United Kingdom and France – remains one of the most costly privately funded projects (Anbari et al, undated: 8). It was privately financed by governments on both sides of the divide (secured funding from over 200 financial institutions), modelled after the Build-Own-Operate-Transfer form of contract, and involved over 600,000 shareholders (Morris, 1997:171; SMEC, Holdings, Ltd, 2001). At the peak of construction of the Channel-Tunnel alone, it had employed a workforce of 15 000 (Anbari et al, undated: 8).

Invitation for proposals was made twelve years after serious conceptualisation in 1955 but, again, the project was shelved until 1980s mainly due to financial difficulties (Morris, 1997:171-173). Following an agreement in 1982 by both governments to conduct a feasibility study on private financing, a viability report was eventually produced in 1984 (Ibid, p173). Accordingly, project promoters – who turned out in this case to be banks and contractors – were invited in April 1985 to submit proposals

within six months for adjudication and tender award early 1986 (Stannard, 1990:49).[11] The projected construction cost for the seven-year contract was British Pound Sterling (GBP) 4.7 billion (in 1985) but ended up at a completion cost of GBP 9.5 billion – 99% cost overrun – (Anguera, 2006:301). Construction was to start in 1986 but was delayed until 1987 partly due to staffing problems in relation to the provision of strategic direction, contract management and administration (Morris, 1997:174). Contractual arrangements and agreements pertaining to sharing of cost-savings and risk allocations were drawn but were soon marred by conflicts and a two-fold mistrust (Stannard, 1990:51). First, UK made some necessary changes in technical specification but refused to commit additional resources and time extension for the tunnelling; in addition, contractors' delay in loan acquisition from the banks for the project was not compensated by the client (Ibid, p52).

Second, there was lack of basic understanding in relation to the *modus operandi* of the project finance and construction contract on the part of the contractors and the banks respectively (Ibid, p53). This made loan negotiations extremely difficult. Thus, the financial and construction delays were also orchestrated by the complex financing plan, unrealistic funding arrangements, and initial mistrust that ensued between the project promoters (Stannard, 1990:53; Morris, 1997:174; American Management Association, 2006:35-36).

The project was completed behind schedule with significant contractual claims and costly conflict resolutions, and significant cost escalations (Anbari et al, undated: 3-9; ECMT,[12] 2003:85; The Public Purpose, 1998). Contrary to initial projections probably due to incorrect design assumptions, the early years of operation incurred a massive loss (The Public Purpose, 1998). An ex-post economic analysis revealed huge cost overruns and poor rates of returns (Anguera, 2006; Flyvbjerg, 2007:4; Reilly, 2005:533). ECMT (2003) remarked, *"Due to the famous cost overruns in the Channel*

[11] Stannard was Managing Director of Eurotunnel (Owner organisation for the Channel Tunnel) until late 1980s.
[12] ECMT stands for the European Conference of Ministers of Transport.

Tunnel Project, there are also lessons for improved project financing and management".

Despite the quality of work, Anbari et al (undated:32-34) identified inadequate cost and contract management to be the main weaknesses probably due to the complexity in funding arrangements and also the lack of a standardised change control mechanism. Thus, the necessity of designing and executing a well-informed change management plan is paramount in successful mega projects. In addition, these authors concluded, among other things, that (i) large-scale projects require clear objectives and adequate planning; and (ii) better project risk management includes definition and validation of roles and responsibilities of a highly productive project team armed with adequate authority to deliver; and (iii) *"fast tracking projects when the technical problems are unknown compounds the risk factors"*

The difficulties experienced in securing the required funding on time casts a shadow about the ability of private sector to undertake or engage in development projects of such magnitude. For a successful privately funded public large-scale infrastructure development, Ong and Lenard (2002:9-13) stipulate the following preconditions, namely; (a) strong political will and commitment from all levels of government and stakeholders; (b) economic stability of the country concerned; (c) learning from project lessons; and (d) training of all project personnel – including technical and management teams, project managers and administrators. Crucial factors such as the scale and size of mega projects, the complexities and inherent high risks all render good training imperative for success.

The Channel-Tunnel Rail Link

On the UK side of the channel, a rapid rail connection was built over 109km from St. Pancras in London. As a precursor to the project, the UK government commissioned research into the viability of a new, high speed rail line from London to the Channel Tunnel; however, decision to proceed was only to be finalised more than two decades

later in 1994 (Pollalis, 2006:2; 6). The thirteen-year privately funded project was estimated at GBP 5.2 billion (2006 prices) with the completion date scheduled for the third quarter of 2007 (Ibid, p22). Essentially, it was a Build-Own-Operate-Transfer (BOOT) project for a 60 year concession period (Ibid, pp6-7). The average design speed is 300km/hr and purposed to carry both goods and passengers (Major Projects Association, MPA, 2004). The main objectives of the Channel Tunnel Rail Link are as follows (ibid):

(i) to increase railway capacity between the Channel Tunnel, Kent and London;
(ii) to improve international and domestic journey times; and
(iii) to stimulate regeneration in the Thames Gateway and inner London.

In 1996, London Continental Railways Limited was awarded the GBP 5.8 billion project to construct the link from St. Pancras, London, to the tunnel (House of Commons, 2006:3; 11). The cash-flow problems (difficulties in loan acquisition) experienced during the tunnelling of the actual Channel-Tunnel between UK and France continued unabated; the project had to be suspended until 1998 (Pollalis, 2006:10). Due to the financial difficulties, the original construction contract was restructured and consequently split-up into two phases.

Phase one, a 78 km distance – from the Channel Tunnel to Fawham Junction around Ebbsfleet – was started late 1998 and in relation to restructuring date, was completed on time and within budget in 2003 (House of Commons, 2001:1; 2006:3; MPA, 2004). Phase two of the project – the more complex of the construction work – runs from Southfleet Junction near Ebbsfleet to St. Pancras over a distance of 37 km and was completed late 2007 (MPA, 2004; House of Commons, 2001:1; 2006:3).

Despite the difficulties in raising funds, the technical challenges and administrative complexities, phase two started in 2001, and was projected to finish in 2007 but at a higher cost due to the forces of inflation and several scope changes (House of Commons, 2001:3; 2006:3). Long term government support was necessary to complete

the project (House of Commons, 2001:4-5). Experiential knowledge gained – including contract packaging and management issues from Phase One, was factored into the construction and management of Phase two (MPA, 2004). As at 2006, the Channel-Tunnel Rail Link had generated eight thousand new construction jobs (Pollalis, 2006:22).

For better project results, management pursued a series of strategies: these were in the alignment of project objectives and organisational goals and vision; a strong risk management plan with the appointment of suitably qualified and experienced personnel to identify and manage them; worked with appropriate form of contract (the New Engineering Contract); adopted a partnering policy and developed a strong project team (MPA, 2004).

However, as at 2004, the phase one link was running at a loss due to unrealistic estimation of daily passenger numbers and analysis of benefits – the prediction was approximately 66% off target (House of Commons, 2001:6; 2006:4). Thus the appraisal method used was highly flawed due to the incorrect project assumptions. Establishing project economic viability may arguably require both internal and independent appraisal teams.

The MPA (2004) analysis indicates that a complex project of such magnitude demands, among other things, (i) developing an effective project team, strong motivation and policy direction; (ii) strong change control for timely project delivery; (iii) good and relevant training; and in addition (iv) clearly defined roles, responsibilities and accountability.

2.6.3.2 The Trans Alaskan Oil Pipeline Project (USA)

Construction of the Alaska pipeline, arguably one of the most complex and costly privately funded projects in US history prior to the 1980s, has several implications and lessons for the organisation and management of large-scale infrastructure development. Undertaken to develop the energy sector, the project was completed in 1977 despite the extreme technical difficulties and construction challenges at a final cost of US$8

billion compared to the initial estimated budget of US$3 billion in 1970 (Fawcett, 1985:368; Tokyo Tech OCW, undated:32). At its peak, the project employed over 70 000 workers of which women constituted 5 – 10% (Aucoin, 1997:1; Coates, 2001:70; Alyeska Pipeline Company, 2008).

Proposal to the US government was made and finalised in 1969 to construct a 1280 km long, 1200 mm diameter oil pipeline from Northern Alaska (near Prudhoe Bay) to Port Valdez (in Alaska); the purpose was to deliver about 20% of US annual oil production – which translates into about 2 million barrels of crude oil per day (Coates, 2001:66; Sakhalin Energy Investment Company, 2003:2; 8).

Essentially, the project comprises the construction of 1280 km pipeline over three mountain ranges, earthquake zones, and more than eight hundred streams and rivers; 11 pump stations; a 576 km gravel haul road; 3 pig launching or receiving facilities and a marine terminal at Valdez (Alyeska Pipeline Company, 2008). Thus, the size and scale of the project alone presented substantial construction risks. Planning and design preparation took approximately six years, and the time required for construction was 3 years and two months (that is, from April 29, 1974 to June 20, 1977) (Alyeska Pipeline Company, 2008). This validates the rule-of- thumb for construction management about appropriate scheduling for planning and design compared to duration for execution of large-scale projects (Wideman, 2001; and Rogers, 2006).

Large-scale projects, by virtue of their size and strategic importance, affect nearly all citizens significantly, and without adequate involvement of relevant stakeholders, project implementation would invariably face difficulties (Fawcett, 1985:370-371). Prior to construction, the project experienced significant start-up problems because of legal issues and major redesign work as a result of opposition from environmentalists and indigenous people of Alaska (Coates, 2001:74). Consequently, the Alaska pipeline project took four years (with reference to the planned start date of 1970) to build a public consensus (Aucoin, 1997:2), whereas the actual construction spanned over just three years (Fawcett, 1985:368). The experience underscores the importance of

effective community participation and stakeholder management in large-scale or infrastructure development programmes.

The initial organisational set-up resulted in unnecessary delays in decision-making (Hendrickson and Au, 1989: 2:15-16). The project owner, represented by Alyeska Pipeline Company, employed two Construction Management Contractors oversee the entire project and manage the contractors, subcontractors and vendors in the supply chain (ibid).

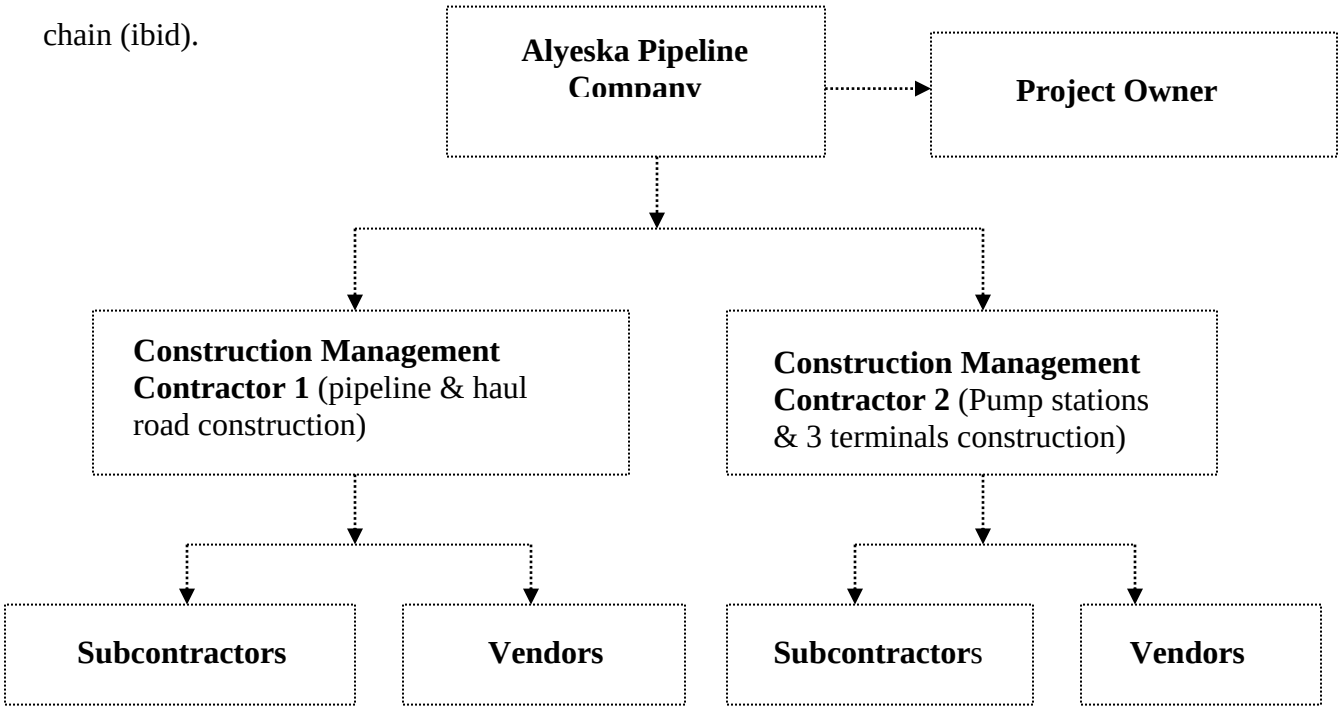


Figure 2.3 Original organisational chart for the Alaska Pipeline project

Source: Adapted from Hendrickson and Au, 1989

In keeping with good site organisation, the entire pipeline construction was divided into six sections and six main contractors working concurrently at different installation locations together with a large pool of contractors and subcontractors totalling approximately 2000 (Aucoin, 1997:3; Alyeska Pipeline Company, 2008). However, the high centralisation of decision making by both the Owner and the Management Contractors presented another problem: timely decisions could not be made and

implemented. Organisational chart Figure 2.3 represents the original lines of responsibility and accountability.

In Figure 2.3, each construction management contractor appointed a general manager. However, between the general manager and the subcontractors, there were seven levels of organisation (Hendrickson and Au, 1989: 2: 15-16) with several lines of authority. This ill-conceived, complex chain of organisational set-up resulted in communication and project management problems, duplication of efforts, lack of cost control, and inability to form decisions on time and plan accordingly (Tokyo Tech OCW, undated:74). To solve the problem, reorganisation resulted in an integrated project management team made up of the Owner and Construction Management Contractors represented by a Senior Project Manager (ibid; Tokyo Tech OCW, undated:59-61). Consequently, the tiers of organisation from this new management team to the subcontractors were reduced to only four. In addition, some degree of decentralisation in decision-making was also introduced at different geographical locations along the 1280 km pipeline. As a result of the reorganisation and coordination, communication was significantly improved; decision-making enhanced with positive implications for project implementation (Hendrickson and Au, 1989:2: 15-16). Thus, simplicity should govern all organisational structures in such large-scale endeavours; for, the more complex the chain of command and communication, the higher the probability of failure. Equally, the creation of multiple project management teams for large-scale programmes would end up in organisational chaos and delay decision-making (Tokyo Tech OCW, undated:68).

Procurement of resources for the multi-construction sites was massive but well-organised (Aucoin, 1997:2). Besides equipment, machinery and trucks, three million tons of material were shipped to Alaska for the project (Alyeska Pipeline Company, 2008). Casual construction works included 16 airfields – two of which were retained after the project – and 29 construction camps (Ibid). According to Aucoin (1997:3), the original plan for quality control of pipeline welding and inspection was to use X-

ray but was later done labour-intensively (to meet the *zero-tolerance* principle adopted) due to the absence of X-ray experts.

Fawcett therefore postulated that, *"The hallmarks of successful macro-projects are a focus of committed and competent leadership at the top-level of government and at the top level of the project organisation" (1985:371)*. In relation to infrastructure development programmes for poverty-alleviation, therefore, a programme champion is necessary to ensure delivery. This is necessary to maintain programme vision and secure commitment to succeed.

2.6.3.3 Lessons from large-scale industrial projects

The foregoing discussions present several useful lessons for improving performance of large-scale infrastructure development programmes. Some of these are as follows.

- Large-scale programmes, by their nature and background are complex with inherent high degrees of risk. Poorly defined project objectives lead to scope changes, misallocation of scarce resources and cost escalation. Given that many of these projects took twice as long to plan and design as the actual construction, and still ended up with significant project management problems including cost overruns, it suggests that adequate lead-in time for sound preparation is necessary for all projects and programmes. Fast-tracking large-scale projects or development programmes is false economy because of the costly risks involved.

- Equally, because of the long programme duration, the likelihood of losing direction is high. What is required therefore is a programme champion to maintain vision and direction in order to ensure ultimate success.

- All large-scale projects and programmes that ignored the importance of community participation to address fundamental issues ran into significant start-up problems and budget overruns. Thus, prefeasibility studies and community participation are central to success in any large-scale national endeavours.

- Lack of adequate, reliable sources of funds is detrimental to the success of every programme in terms of delays, cost escalation and in the realisation of benefits.

- Similarly, complex project funding arrangements could result in construction delays and translate into significant cost escalation. This applies in particular, in instances where financial institutions and project implementers lack proper understanding about how each industry operates. Mistrust ends up in difficult financial negotiations and invariably affects the project. Thus, well-thought training and orientation of all stakeholders (including financial institutions, decision-makers, programme teams, contractors) in mega projects is necessary to prevent undue start-up problems.

- Good project management skills and teamwork are essential in ensuring that projects are delivered on time, within budget and to specification. For example, in all successful large-scale projects, risk management is assigned to organisations with sufficient skill and experience able to identify, quantify and treat them as they arise.

- Complex organisational structure with multiple teams and multiple authorities may lead to paralysis and tardy decision-making. The end results are unwarranted time slippage, inability to deal with risks on time, and ultimately cost overruns. Hence, for good communication and better project control, simplicity should be the guiding principle in organisational structure formation for large-scale projects. Creation of a single management team, strong leadership and commitment from all levels of decision-making are crucial to the success of large scale industrial projects. A single project management team is more functional compared to multiple teams.

2.6.4 Good practice, tools and instruments for improving performance

Literature indicates that most development programmes, even where adequate funding is secured, fail for a number of reasons. In particular, lack of proper programme definition, over-ambitious objectives, and poor preparation are common denominators for failed programmes.

A repository of good practices and tools abound for helping to improve programme design, especially getting the fundamentals right before venturing into implementation. Typical examples (Baum, 1982; Sartorius, 1991; Picciotto and Weaving 1994; World Bank, 2001; Fransen et al, 2002:8-17) are (i) the logical framework analysis for formulating objectives that are realistic and achievable within specified time period, analysis of resource requirements, assessing risks and programme assumptions and preparing for programme monitoring and evaluation; (ii) community participation and how to foster project ownership, identify project needs, determine level of service, ensure cost recovery, and project sustainability; (iii) the four-phased approach to ensure success in large-scale development programmes; (iv) theory and principles of labour-intensive construction; (v) World Bank traditional and new project cycles, and processes involved for implementing development programmes; and (vi) prefeasibility studies.

Again, if all these good practices, tools and instruments are available, why the failure to implement large-scale, anti-poverty, infrastructure development programmes? One simple underlying problem for the morass is the tendency to fast-track development programmes without adequate preparation. In some countries, funding may be critical issues.

2.7 Findings from the literature review and implications for large-scale development programmes

Literature indicates that one major factor contributing to failure of most large-scale projects is inadequate preparation – which stems from insufficient project definition and lead-in time for proper pre-feasibility studies and planning. Another explanation for the problem is the tendency to rush into implementation for political reasons or pressure. The immediate ripple effect is misallocation of programme resources and inability to identify potential risks and manage them effectively.

Good planning, technical and project management skills are essential for implementing a successful infrastructure development programme. However, lack of serious commitment to training and capacity building has been one of the underlying reasons for the non-delivery of services in South Africa. Where training is equated to instructions in life-orientation skills only given to labourers on EPWP jobs and not directly relevant to the programme, overall programme performance is easily predictable: the quality of product is sacrificed. All programme participants need adequate training. For example, quality training should be provided for the following:

- Professionals (e.g. planners, project managers, engineers, architects and construction managers) in technical issues, management and related matters;
- Supervisory and management teams in supervisory skills, contract administration and management;
- Artisans and labourers in construction skills.

Decision-makers fail to understand that it takes significant amount of time to train and develop skills. This reason alone, demonstrates the fruitlessness of rushing into programme implementation without adequate early preparation to sort out essential elements for success. Thus, capacities in planning, technical, financial and project management (including cost control), change management, contract administration and management (for example) should be strengthened for better programme results.

To help solve the capacity problem, government should use appropriate incentives and compelling motivations to effectively engage retired professionals and the private sector in training and developing new, inexperienced middle and senior level managers and employees.

Development infrastructure programmes for poverty alleviation are by themselves complex with inherent high risks, and therefore cannot be fast-tracked for whatever reasons. Lack of understanding of this leads to several undesirable consequences such as poor programme definition, inadequate planning, scope changes, waste, costly programme disruptions, increased programme risks and dilution of programme benefits.

Development programmes have long planning horizons and implementation periods. There is therefore the tendency to lose track, and fail to achieve intended goals and objectives. A programme champion is needed to maintain policy direction, vision and to manage project benefits.

Lack of commitment and leadership at Provincial and local tiers of government present formidable challenge to policy implementation (for example in relation to construction method and employment issues). Policies must therefore be carefully evaluated to ascertain they are well-communicated and supported by availability of required resources and capacity to render them practicable. The need for a programme champion cannot be underestimated in this regard.

Large-scale projects and programmes attract a wide range of stakeholders. Failure to involve relevant stakeholders (including self-proclaimed ones) in decision making and in the project cycle is likely to trigger serious opposition and time slippage. This translates into significant cost overruns. Thus, risk management should also include community participation and pre-feasibility studies culminating in the production of a pre-feasibility report.

In projects where small contractors have to secure loans from financial institutions for acquisition of equipment, proper education and orientation of the modus operandi pertaining to project finance and construction contracts should be given in order to pre-empt mistrust and undue programme delay.

Maintaining a single programme management team helps to prevent community breakdown, duplication of effort and waste of resources. Multiple programme teams are detrimental to the health of any development programme. Thus, roles, responsibilities, lines of authority and accountability should be clearly defined to avoid duplication of efforts and the resultant chaos.

In several countries, decision-makers and programme implementers never learn from project lessons. Developing countries that do have institutionalised monitoring and evaluation as development cultures have improved programme results significantly. Thus, attention should also be given to monitoring and evaluation, and making productive use of results. Major challenges in this regard include lack of requisite capacity in government; lack of political will and commitment to undertake monitoring and evaluation.

In sum, literature demonstrates that many large-scale industrial projects and development programmes fail because of management problems, capacity issues and financial constraints. The evaluation (of large-scale industrial projects and programmes undertaken elsewhere) holds lessons for future poverty-reduction infrastructure programmes in South Africa.

The large-scale projects in industrialised countries have broad implications for capacity building and project management. However, they are not focused on employment creation and poverty reduction in a developmental context. Greater attention needs to be paid to endeavours with a developmental focus, particularly those with focus on employment creation through the provision of infrastructure in sub-Saharan Africa. In

relation to the latter, McCutcheon's analytical work, from late 1980s to early 1990s, produced systematic guidelines for implementing successful large-scale employment-creation programmes. However, severe shortcomings exist in subsequent programmes. In addition, McCutcheon focused primarily on early Kenya and Botswana programmes, the analyses of which have not been updated by him despite several subsequent endeavours in both Kenya and Botswana. Equally, three other countries have implemented large-scale employment creation infrastructure programmes: Ghana, Malawi and Lesotho.

Furthermore, no cross comparison between all the five sub-Saharan development programmes has been carried out (despite several subsequent initiatives in both Kenya and Botswana.) These programmes constitute model case studies that South Africa should draw on regarding their good practices and strengths whilst minimising their weaknesses.

Thus, in order to contribute more fully to future large-scale employment creation initiatives, including the Expanded Public Works Programme (EPWP) in South Africa, it is essential to provide a detailed description and analysis of the five sub-Saharan programmes from the 1980s to date. Therefore, Chapters Three to Seven of the thesis present detailed descriptions and analyses of, and cross comparison between, the five large-scale infrastructure development programmes implemented in sub-Saharan countries, namely; Kenya, Ghana, Botswana, Malawi and Lesotho. Lessons drawn should serve as reference points for employment-creation programmes through the provision of basic infrastructure in Africa and elsewhere.

CHAPTER 3: CASE STUDY 1: THE KENYAN ACCESS RURAL PROGRAMME AND SUBSEQUENT PROGRAMMES

3.1 Background of the Programmes

Kenya, an East African country of sharp differential landscape, is sandwiched between Somalia, Tanzania, Uganda, Ethiopia, Sudan, and the Indian Ocean. It has a total area of 582, 650 km^2; topographical conditions consist of a series of low costal plane of plateau to mountainous countryside, with the Rift Valley having the second highest altitude in Africa (US Federal Research Division, 2007).

With a population of 36.9 million[1] in 2007, Kenya's highly skewed population distribution stands at approximately 59 people per square kilometre. According to US Federal Research (2007), approximately 50% of the population live below the poverty line (by the Kenya's definition) in the 1990s compared to about 56% in 2001. Increasing unemployment and poverty are two principal socio-economic problems confronting the country. Kenya operates a market-based economy with the combined agriculture and tourism sector employing approximately 75% of the population. However, several years of declining economic performance and deteriorating public infrastructure in the wake of population explosion, have resulted in increased poverty and mass unemployment (US Federal Research Division, 2007).

In assessing the impact of assistance to Kenya from 2004 to 2007, the World Bank joint report (World Bank, 2007b) by the International Development Association (IDA), the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA) indicated satisfactory achievements especially pertaining to macroeconomic management and economic recovery. For instance, Table 3.1 shows that Kenya's economy grew steadily between 2003 and 2007 (World Bank, 2008). In addition, absolute poverty fell from 53.3% in 1997 to 46.1% in 2005/2006 (Ibid). Out of the 46.1% people below the poverty line, 84% come from the rural communities. However, despite the gains in economic growth prior to the political turmoil in 2008, poverty remains disproportionately high with inequitable income distribution (World Bank, 2008). Government forecast in 2005 projected that if no systematic effort was undertaken,

[1] According to US Federal Research, population in the early 1980s was about 15.3 million

the percentage of Kenyans living below the poverty line would reach approximately 66% by 2015.[2]

Table 3.1: Kenya: Key Economic Indicators

Year	Real GDP growth (%)
2003	3.0
2004	4.9
2005	5.8
2006	6.1
2007	7.0

Source: The World Bank, 2008. Http://www.worldbank.org/Kenya.
Accessed: 20/10/2008

As at 2005, Kenya had a total classified road network of 64 000 km. The one-eighth that is paved carries about 80% of the aggregate passenger and freight demand of the country. However, lack of maintenance coupled with under-investment and non-coherent institutional framework has left the road network in a poor state resulting in the highest road cost (in human terms) in the world.[3] As a result, business has been unable to achieve economy of scale (Kilby, 2003). The Government of Kenya identified this as a major constraint on economic growth and poverty reduction (Ibid). Therefore a large-scale national roads programme, among others, was appropriate to improve the standard of living of the poor.

Over the last three decades Kenya has implemented three large-scale, national employment-intensive road infrastructure programmes with two-prong over-arching objectives: to improve road conditions and reduce poverty. These have resulted in over 14 000 km of rural access roads constructed or improved. These are the Rural Access Road Programme in the 1980s – the first most successful and largest employment-intensive programme in Africa – which was succeeded by the Minor Roads Programme – accountable for maintaining the rural access roads from 1987 to 1997, and improvement of over 4500 km of minor and secondary roads (Roads Department, Ministry of Roads, Public Works and Housing, 2004), then the Roads 2000

[2] Government of Kenya, in association with UNDP and Government of Finland (2005). Millennium Development Goals in Kenya.
[3] Ibid, pg 11

maintenance programme. The first programme in 1980s was primarily a response to the need to provide access roads to boost agricultural production and reduce rural poverty by linking the economically productive rural areas to market centres (Kenya Roads Board, 2004); this resulted in about 8 700 km of rural roads constructed labour-intensively. Thus, road transport infrastructure expanded dramatically between 1960s and 1980s to meet socio-economic demands; however, maintenance was largely neglected culminating in widespread network deterioration in the 1990s. Reasons for the dismal performance were identified as principally lack of adequate maintenance policy, inadequate finance and absence of a coherent institutional framework (Kilby, 2003).

Institutional changes were therefore imperative to formulate a consistent maintenance policy, and ensure adequate funds for road maintenance. In 1987, the World Bank launched its Road Maintenance Initiative to promote and facilitate necessary reforms required to ensure sustainable road finance and management in Sub-Saharan Africa (World Bank, 1997). Taking advantage of the World Bank's Road Maintenance Initiative Programme, the Government of Kenya (GoK) undertook to establish a comprehensive national transport policy and efficient road management system to guarantee better road financial management and maintenance (Kilby, 2003). Among others, the GoK established the Road Maintenance Levy Fund in 1994 to secure funds for maintenance. This was a catalyst for the Roads 2000 programme.

The road condition assessment conducted by the Material Branch of the Ministry of Roads and Public Works on the classified road network in 2002 estimated that 17% was in good condition, 39% in fair condition, and 27% in poor condition and required rehabilitation. The remaining 16% had failed completely and required reconstruction (Kenya Roads Board, 2004). Conditions of the unpaved classified roads (including earth roads) were no better. According to the Ministry's assessment report, approximately 60% were in maintainable condition while the remainder needed regravelling and rehabilitation. Equally disturbing was the non-existence of reliable data for the unclassified urban and rural network; and the absence of a road inventory and condition survey (Kenya Roads Board, 2004).

As at 2004, Kenya had an estimated 177 500 km of road network of which 63 000 km were classified and 114 500 km unclassified, managed by four departments under Ministry of Public Works and Housing[4] as captured by Table 3.2.

Table 3.2: Kenya: Road Classification and Managing Authorities

Classification	Administering Agency	Network Length (km)
National Roads (Class A, B, C)	Roads Department	14,000
District Roads: - Unclassified rural roads	District Roads Committees County Councils	49,000 100,000
Urban Roads	City and Municipal Councils	14,500
Total		**177,500**

Source: Kenya Roads Board, 2004.

[4] Kenya Roads Board, 2004, Road Classification. http://www.krb.go.ke/Classification.php Accessed: 27/09/2008.

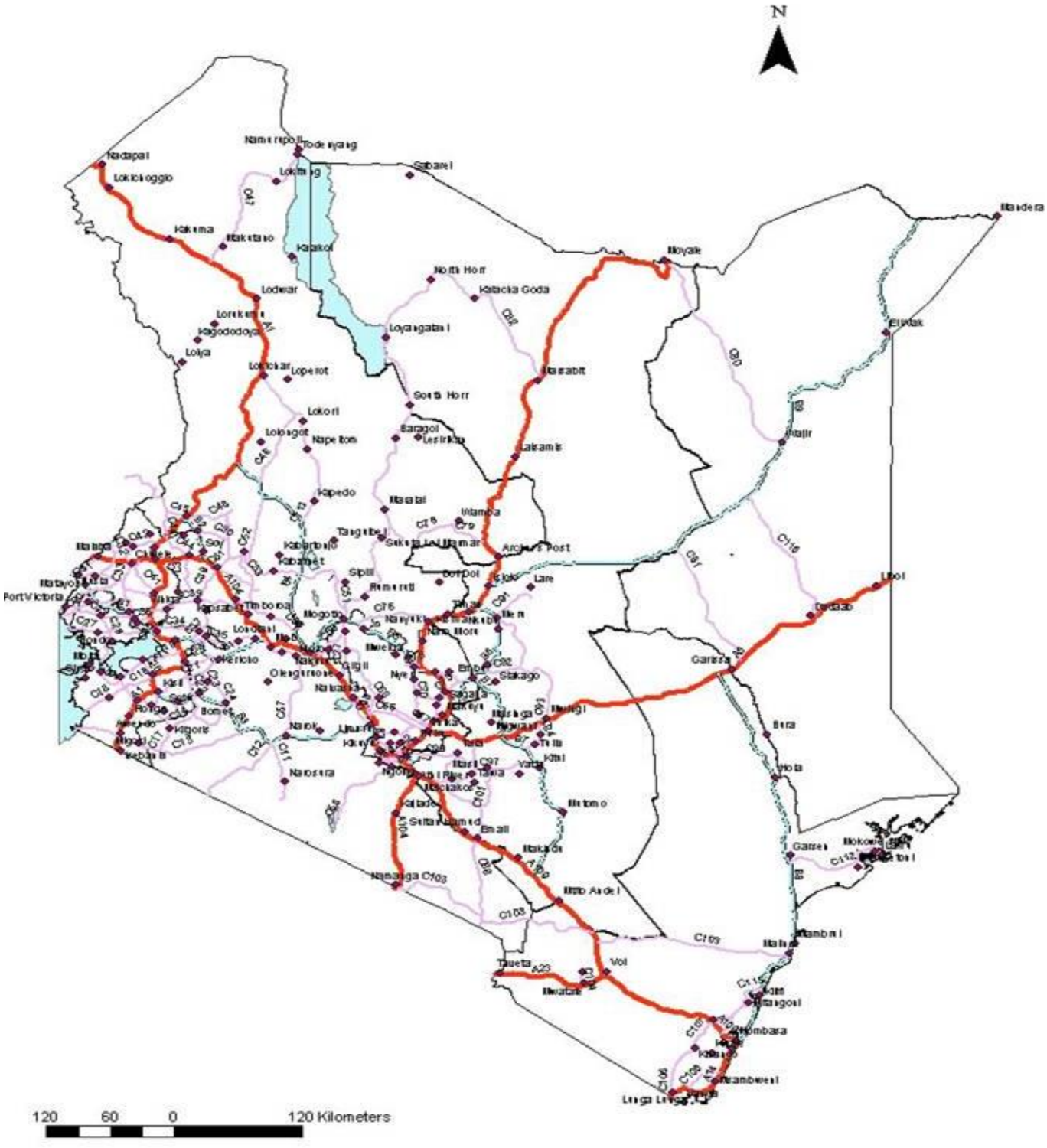


Figure 3.1: Road network of Kenya

Source: Kenya Roads Board, 2004

3.2 THE KENYAN RURAL ACCESS ROADS PROGRAMME (KRARP) (1974 TO 1986): PROBLEMS AND SHORTCOMINGS[5]

3.2.1 Introduction

As part of its policy on rural development, the Government of Kenya initiated a small Rural Access Roads Programme attached to the Ministry of Works in 1974. The major aims were to create access to new farming areas and employment opportunities. This was the first labour-intensive road construction and maintenance programme in Africa, and remains the largest and the most successful. In 1987, the government of Kenya formally upgraded the Rural Access Roads Programme to the Minor Roads Programme. The focus of the latter was the maintenance of the Rural Access roads constructed since 1974 and the improvement and maintenance of parts of the classified road network. This section deals only with the Rural Access Roads Programme, hereafter called the Programme.

Between 1974 and 1986 the Programme was responsible for the construction of 8 000 km of earth road of which nearly 6 000 km were gravelled. During the peak of its construction phase 14 500 casual labourers and 1 400 supervisory staff were employed: in total, over 70 000 man-years of casual employment have been created and 6 000 man-years of supervisory employment. The methods of earth road construction were highly labour-intensive while the surfacing operation was based upon the use of tractors and trailers, far less capital-intensive than orthodox methods of haulage for road construction in Africa.

The use of employment-intensive methods of construction and maintenance on the classified road network was a major breakthrough. By the year 2005, over 5 000 contractors had been employed on maintenance, and since the start of such maintenance in 1977 over 30 000 man-years of employment have been created.

[5] Adapted and modified version of a joint paper (by Professor RT McCutcheon and HA Quainoo) presented at WORK 2005 Second International Conference on Employment Creation in Development: Skills, Training and Education for Employment and Development 5th to 8th September, University of the Witwatersrand). McCutcheon is Professor of Project and Construction Management, and Director of "WORK" Research Centre for Employment Creation in Construction & Maintenance of Infrastructure. Quainoo is a Research Fellow, and PhD student at the "WORK" Research Centre for Employment Creation in Construction & Maintenance of Infrastructure. The paper was based on Quainoo's PhD work.

In 1986 the World Bank (the International Bank for Reconstruction and Development) published its completion report on its section of the funding. It concluded:

> *Considering the institution building requirement, the staffing and related training need, administration and supervision required for the size of the programme, this has been one of the most successful donor-financed programs in Kenya and one of the best organized labour-intensive road construction programs anywhere.*[6]

While constructive criticism may be brought to bear upon the various aspects of the programme, the above quotation summarises most of the informed overall opinion. Constructive criticism is useful not only for the future of the programme itself but perhaps, more importantly, because it has become the model for similar work elsewhere in Africa. However, first it is necessary to sketch the origins of the programme, to state the objectives, to outline the chief methods whereby the objectives were pursued and to summarise the main achievements.

3.2.2 Origins of the Kenyan Rural Access Roads Programme

Despite a 1968 report by Sir Alexander Gibb to the Ministry of Works that labour-intensive work was a third more expensive than equipment based methods,[7] and in spite of initial resistance from within the Ministry of Works,[8] the following factors promoted its inception. In 1970 responsibility for construction and maintenance of all classified roads in Kenya was centralised within the Ministry of Works.[9]

In 1972 the Government of Kenya commissioned the International Labour Organisation (ILO) to look into employment problems in Kenya. As part of its conclusions the ILO recommended the use of labour-intensive methods of rural road construction with a view to increasing employment.[10] The government's policies since the early 1970s emphasized rural development

---

[6] World Bank, 1986.
[7] Gibb Sir A, and Partners., 1986. This was contradicted by findings of a labour-based road Unit set up in Vihiga division (Kakamega District, Western Province) under the USAID financed portion of the Special Rural Development Programme (SRDP).
[8] Private communication: Edmonds to McCutcheon, 1985. (Nairobi: November 1985).
[9] MoTC (A. Beusch), 1987.
[10] ILO, 1972.

and the alleviation of rural poverty. The third National Development Plan (1974-78) contained explicit policies for boosting rural development.[11] The result indicates that compromises were made. In 1975 a Special Projects Branch was created within the Ministry of Works which was responsible for two distinct programmes:

1. Gravelling, Culverting and Bridging Programme: "Major emphasis is to be placed upon improvement of secondary and minor roads in rural areas." This programme was to be carried out by equipment-intensive methods.[12]

2. Rural Access Roads Programme: "High priority (will be) given to new access roads in agricultural area." The farmers said they could produce more food but the lack of roads meant that they could not get to the markets where they could sell the surplus. The KRARP was to be carried out by labour-intensive methods.

Donors were willing to fund the Rural Access Roads Programme *and pay its local costs*. The latter was an extremely important point given the climate of opinion among donors at that time: in general they were only prepared to fund off-shore costs, while the national governments were expected to finance local costs. In 1974 the programme started as a pilot project. This consisted of a field construction Unit funded by the UK, assisted by a Technology Unit funded by the Norwegian Agency for International Development (NORAD). The results of the pilot project were promising and led to a larger programme with the same objectives but with extended scope, output and duration. These were detailed in the 1975 Project Appraisal Report.[13]

3.2.3 Overall programme objectives

The original objectives of the programme were:[14]

a) to provide all-weather access between high potential farming areas and market centres, an endeavour to boost agricultural productivity and ensure food security;
b) to provide meaningful employment opportunities;

---

[11] Lele, 1975.
[12] Hagen, 1985:8. Origin of GCB described in an internal report by Mwangi, 1986.
[13] Ministry of Works, Roads Department, 1975.
[14] Ministry of Works, Roads Department, 1975.

c) to encourage the production of cash crops;
d) to improve the quality of rural life and access to services at "growth centres".

Scope:

a) Duration: 1975 to 1982
b) Geographical coverage: 23 out of the 39 Districts in Kenya.

Output:

a) 14000 km of access road constructed at the standard specified below. This would increase the length of roads for which the public sector was responsible in Kenya by 25 per cent. 84000 man-years of casual employment and 6000 man-years of supervisory employment.
b) Based on 270 to 300 labourers per Unit to produce 45 km per year per Unit.

These objectives were to be pursued through the establishment of a specific organisation dedicated to the construction of rural access roads by labour-intensive methods. The basic methods of construction and the organisational routines needed to facilitate labour-intensive work had been initiated during the pilot phase. A Technology Unit was created to elaborate all the details necessary for transition from a pilot to a national programme. This included preparation of all the training material required for the different levels of site personnel.

From the perspective of planning a national programme, it is important to note that after the pilot project, the devisers of the expanded Programme were extremely selective as to where further implementation should take place. Seventy-five (75) percent of Kenya's 580 000km^2 is classified as desert, semi-desert or arid bush. During the 1970's eighty-five (85) percent of the population lived on less than 20 per cent of the land;[15] the majority of the population being located in the 23 Districts with the highest agricultural production. These were the Districts which were identified as being suitable for expansion of the Programme.

[15] Miller,1984.

3.2.4 Organisation, training and construction methods

In 1975 a Special Projects Branch was created within the Ministry of Works. In 1979 the Ministry of Transport and Communications was established and the Rural Access Roads Programme fell under the Construction Branch of the Roads and Aerodromes Department within the Ministry. The medium-term financial health of the programme was secured through specific commitment by eight donors and the Kenyan government, the latter promising to provide twenty-five (25) per cent of the budget.

Field operations were based upon a Unit headed by an Officer-in-Charge. Each Unit comprised three construction teams (60 to100 labourers per team), a structures team and one gravelling team (±60 labourers). Each team was supervised by an overseer assisted by three to four Headmen who were each responsible for 15 to 25 labourers.

At the outset it was planned that one engineer would be responsible for eight field Units.
All aspects of site organisation were rigorously controlled including:

(i) recruitment of casual labourers;
(ii) daily administration of casual labour;
(iii) site supervision of construction;
(iv) payment;
(v) tools (procurement, quality, storage, repair and control) and
(vi) equipment.

A Technology Unit created to assist the programme, was to be responsible for:

a) investigation of new problems;
b) development work: both technical and organisational (e.g. reporting/ monitoring systems, including the requisite forms);
c) production of technical manuals;
d) production of training manuals.

A Field Training Unit was also created in a District with varied landscapes, both flat and hilly. Officers in charge of Field Units were trained for six weeks, site overseers for 13 weeks (with a

further three weeks for gravelling) and there were special courses for plant operators. Additional courses were provided at Overseer level:

Structures (13 to 15 weeks)
Maintenance (3 weeks)

Within each operation optimum utilisation of the labour force was carried out by careful balancing of the teams so that the work went ahead uniformly. On site the construction methods were standardised into an orderly set of procedures within which lay clearly defined activities. While the construction process was designed to be standardised as far as possible by the clear definition of tasks and their measurement, it was accepted that only about sixty percent of the work could be done according to task rates. Supervision and control of the construction operation was carried out by a combination of means which included:

- Authority for organisation of the site was vested in a thoroughly trained “hands-on” site supervisor.
- Monthly, weekly, daily work plans were set by the site supervisor, which entailed the balancing of teams of workers on operations spread over three to ten kilometres in distance along the route and the balancing of the workers engaged on the different activities within each operation.
- A sensible wage rate was agreed upon at local level prior to the start of construction and set within a framework formally established at national level.
- Rigorous conditions of employment were established, such as:
    - acceptance of instructions by the hands-on site supervisor;
    - adherence to an agreed time for starting work;
    - task based work where appropriate;
    - where tasks were set: payment only on completion of the task;
    - monthly payment;
    - no work, no pay.
- Control and maintenance of tools and small equipment;
- Daily recording of muster roll and output; weekly and monthly reports.

3.2.5 Achievements of the Programme by December 1986[16]

The major achievement has been the large scale demonstration of the technical feasibility and economic efficiency of labour-intensive methods. In more detail other achievements may be summarised as follows in the Table 3.3

[16] Data in this section adapted mainly from Hagen, 1985 and World Bank, 1986.

Table 3.3: Kenyan Rural Access Programme: Achievements

OBJECTIVE	PLANNED	ACTUAL	% ACHIEVED
OUTPUT:			
• Total km of earth road	14 000	7 753	55.4
• Gravelled	14 000	5 812	41.5
• Not requiring gravel		462	
• Earth		1 479	
SCOPE:			
• Number of Districts	23	26	113.0
• Number of Units	74	46	62.2
EMPLOYMENT:			
• Number employed at peak		14 450	
- Construction		9 696	
- Maintenance		4 754	
- Contractors employed in 1986		> 5 000	
• Many-years of employment created:			
- Casual	84 000	70 000	83.3
- Supervisory	6 000	6 000	100.0
TRAINING:	3 441 over 5 years (1976-1980)	1 013 @ 2% of total project costs	29.4
• Number of officers-in-charge		41	
• Maintenance inspectors		11	
• Overseers (construction, gravelling, structures, maintenance)		474	
• Training Units	Field Training Unit	Special training school at Kisii	
OVERALL EXPENDITURE:	$56.5 million (1975 prices)	$35 million (1975 prices)	62% for @ 56% of projected output
• Investment (remained inside Kenya)		$24 million	69
• Wages /Programme cost			56
QUALITY OF WORK:			
• (1983 study by Sir Gibb & Partners)[17]		Of the 6 970 km earth roads constructed, only 1 111 required rehab.	
WORKDAYS /KM	1 500	1 500 – 2 600	
INSTITUTIONALISATION	Not mentioned in original project document	KRARP integrated into existing Ministry of Works	
• Number of Kenyan national Engineers employed		From 0 in 1974 to 23 out of 29 in 1985	
• Training Centre	Field Training Units	Establishment of Training School at Kisii	

Source: McCutcheon and Quainoo, 2005

[17] Gibb, Sir A and Partners,1984.

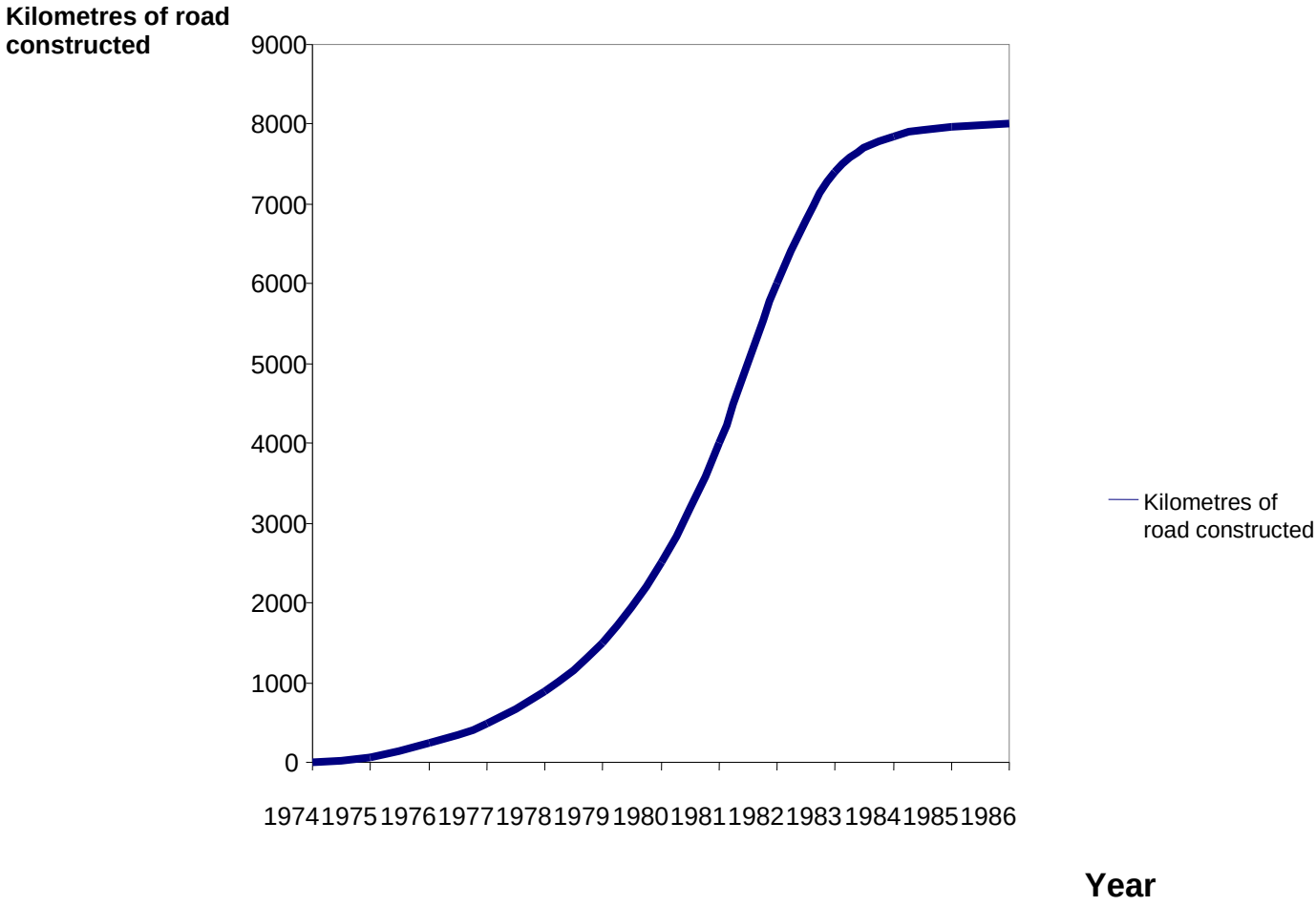


Figure 3.2: Kenyan Rural Access Programme: accumulated length of road constructed
Source: McCutcheon and Marshall, 1998

Figure 3.2 illustrates the growth of the Programme between 1974 and 1986. Particular attention is drawn to a comparison between the early period during which relatively few kilometres were constructed and the period after 1978 when output increased rapidly. The significance of the S-curve with initial *slow pace* of construction is that, for success, time is needed to address important issues such institutional, technical, organisational and general management. During the period 1974-1976, the ratio of overheads to direct construction costs was 84:16; for the whole period 1974-1986, the ratio was 16:84. The lead-in time during which systems are developed and formal training is initiated is of crucial importance for the successful development of large-scale, long-term development programmes.

3.2.5.1 Maintenance[18]

At the start of the programme it had been decided that the Maintenance Branch should take care of the roads once they had been constructed,[19] but by 1978 the Programme was beginning to use labour-intensive methods to maintain its own roads. By 1986 the Ministry was employing, on a casual basis, over 5 000 people who maintained the roads constructed by the Programme. However, it must be pointed out that maintenance was not formally considered in the initial planning of the construction Programme. It became a by-product of the construction process because the engineers quickly realized that if the roads were not maintained they would return to bush. While construction was proceeding nearby it was not too difficult to allocate a few workers to maintenance. Once the construction process had moved further away some system was required. This led to the use of "length-men" responsible for the maintenance of one and a half kilometres of constructed road. Over time it was realized that a more formalized system was required, which eventually led to the Minor Roads Programme, discussed in section 3.3

3.2.5.2 Extent of Innovation and Re-engineering

Since the Kenyan Rural Access Roads Programme was the first and has remained the largest labour-intensive programme, its innovations were manifold. The major being:

(i) The establishment of a large scale, long-lasting national programme of labour-intensive rural road construction which became fully institutionalized within the national bureaucracy.
(ii) Implementation of road construction through a carefully controlled system where attention had been paid to nearly every detail.
(iii) Implementation of gravelling through a carefully controlled system based on tractors and trailers.
(iv) The creation of an integrated national training programme.
(v) Localisation of senior as well as junior supervisory posts.
(vi) Maintenance carried out by labour-intensive methods.

[18] McCutcheon, 1989 b.
[19] MoTC "Revised Loan Application ..." (1975) op. cit.

The integrated national training programme included the establishment of the Kisii Training College, which was devoted specifically to training of the various levels of management and specialist skills. At first the training did not include the engineers; however the need for specific training of engineers was finally acknowledged and instituted in 1986. The college was deliberately situated in a District which required many access roads to be built; it was thus possible to integrate classroom and site training.

3.2.6 Reasons for Success

The major reasons for the success of the programme have been as follows:

(a) The initial intellectual assessment of the feasibility of using labour- intensive methods was sound: productive employment was created which resulted in good quality roads.

(b) Technical aspects received concentrated alteration during a 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.

(c) Organisation has been strong with a balance between the decentralization essential for grassroots operation and the centralization required for a national programme: initial selection of roads and construction itself were decentralized while overall planning, budgeting, monitoring, systems control and training were centralized. The reporting 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 no longer sustain its dual role and has had to be revised.

(d) 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.

(e) There was long term political support from key senior officials, first within the Ministry of Works, later within the Ministry of Transport and Communications.

(f) There was long-term financial commitment from the Government of Kenya and the eight Donor Agencies.[20]

[20] Canadian International Development Agency; Danish International Development Agency; Norwegian Development Agency; Overseas Development Agency (UK); Swedish International Development Agency; Helvetia-a Swiss Development Agency; United States Agency for International Development; and World Bank.

(g) There was good co-ordination between the Government, the Programme and the eight Donor Agencies. This was facilitated by technical assistance from the ILO. The co-ordination assisted the development of flexibility on points of contention to accommodate the views of all parties for 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.

In various ways the programme had to adjust to realities experienced during its phases. The programme would not have survived without such accommodations: ultimatums were less successful than compromises without losing sight of the essential elements of rural employment creation and good quality road construction.

The Kenyan Rural Access Roads Programme was immensely successful and it should be the basic model for any country wishing to introduce such a programme. This list of reasons for success could be used as a primary check against which to assess any proposed programme in a new country, or any established programme embarking upon new directions.

3.2.7 Problems and Shortcomings

Notwithstanding the immense success and exemplary of the Kenyan Rural Access Programme (KRARP), there are aspects that may be constructively criticised, not only in order to improve the effectiveness of the programme itself and its successor the Minor Roads Programme, but perhaps more importantly, because the Rural Access Roads Programme has become both the flagship and the model for similar work elsewhere in Africa. Analysis of problems revealed that the KRARP had been adversely affected by intellectual and analytical shortcomings, technical miscalculations, administrative and management realities, and political interventions. The problems have been highlighted as a warning and a challenge to similar employment-intensive programmes anywhere to resolve.

3.2.7.1 Scope of the Programme and Output

Instead of 74 Units by 1980, there were only 39, which rose to 46 Units by 1985. Given the serious discrepancy between the estimated and actual size of the organisation, the shortfall in output is not surprising. The Project Document envisaged that by 1982, 74 Units would have constructed and gravelled 14 000 km of road. By 1985, 46 Units had constructed nearly 8 000 km which, if the rate at which earth roads had been constructed during 1980-81 had been continued, over 10 500 km could easily have resulted by 1985. However, attention and resources were diverted to gravelling.

Once a Unit was established, the rate of earth road construction per Unit was reasonably accurate. However, the time required to establish a Unit was underestimated. This was partly because the fundamental road building skills had to be created from scratch, which required special training programmes. Further, the time taken to put the various elements of a Unit together in each new District took longer than estimated because of local circumstances. Major additional complications were severe difficulties with timely procurement of equipment, and administrative problems related to the cash flow from the Headquarters to the Districts.

By mid 1978, the compounded effect of these factors at the Unit level had impeded the rate at which the national programme expanded. At this stage another effect began to intrude: whereas in 1975 it had been planned that a field engineer would be responsible for eight Units, by 1978 this had shrunk to between two and four Units.

As the rate of earth road construction was more or less in line with the results achieved during the pilot stage, the employment-intensive methods were capable of the outputs predicted. The shortfall in scale and output was therefore largely due to the inexperience of the planners of national programmes of employment-intensive construction, that is, the initial output projections were simply too high. The proposed scale of organisation required to achieve such results was too great in the time frame specified because of the time required to set up the local and the national organisation, complicated by particular unanticipated difficulties.

The planners overestimated the capacity of engineers, who had not been specifically trained in labour-intensive engineering, were not able to manage as many Units as planned and underestimated the amount of work required of an engineer in the organisation as established.[21] This is dealt with in greater detail below. The planners had underestimated the amount of Headquarters time and expertise required to back up and service the field Units. This was largely due to the difficulties with achieving a regular flow of funds to the Units and the manifold problems associated with equipment. The post of Regional Coordinator was established in order to tighten the control of field Units, lessen the load on Headquarters and facilitate the communications between Headquarters and the field. Initially, the need for this post had not been anticipated. It took time for the need to be recognised and then for a response to be formulated and implemented. The inability of programme planners to clearly define job descriptions for Headquarters staff stating their requisite roles and responsibilities is indicative of lack of understanding of the complexity of the endeavour.

Although these aspects illustrate the inexperience of the original planners (as far as employment-intensive work was concerned) it should also be used to underline an extremely important point. Many countries look to the Kenyan model and if this experience is not assessed properly, it can lead to overconfidence in the expectations of new national programmes and subsequent disillusionment if the results are viewed over too short a time scale. It is crucial to emphasize the slow build up of the Kenyan Rural Access Roads Programme. During the initial phase many problems have to be overcome: political, institutional, organisational, procedural, attitudinal, technological, physical and educational.

To establish a proper national programme requires time in order to sort out various details mentioned above. The length of time required to establish a proper employment-intensive programme is one of the major distinctions between these programmes and drought/ emergency-relief type operations. One major lesson from the Kenyan experience is restraint: one needs to draw courage and take care to impress upon Government, local authorities and donors,

[21] Personal Communication: McCutcheon to Quainoo, 1997. During 1986 the Chief Roads Engineer MOTC asked McCutcheon: “Why do we need to train engineers in labour-intensive construction?” Taken together with other comments the implication of this question is that there was no need to train engineers to implement something so supposedly unsophisticated.

that during the initial stages it is more important to get the foundations of the programme right than to spend large sums of money on either employment or equipment.

If one adds to that time the gestation period from the first self-reliance programme in the late sixties, through the 1972 International Labour Organisation (ILO) study, to the start of the Pilot in 1974 one is looking at a total of ten years to achieve viability. It is important for both individuals and Governments engaged in this work to be aware of the time scale involved so that the initial slow build-up and the inevitable problems to be overcome are not allowed to discourage the efforts which need to be made.

3.2.7.2 Gravelling: The most Equipment Intensive aspect of the Programme

Examination of the gravelling component, as distinct from earth road construction, reveals a set of circumstances which ultimately leads to a conclusion that is central to any discussion of employment-intensive work: the need to consider critically the extent to which equipment is required in the context of what can reasonably be expected of it, and how many resources are required to achieve the desired output. Many facets of this discussion will be counter-intuitive to those who are approaching the topic for the first time.

By March 1982, 5 145 km of earth road had been constructed but only 1 804 km (35 per cent) had been gravelled. Increased emphasis was placed on gravelling to such an extent that earth road construction came to a halt in all districts except those financed by the Canadian International Development Agency (CIDA) which had then become a donor. By December 1985, 7 753 km of earth road had been constructed (this would have been at least 10 500 km if the 1980-82 rate had been maintained) while 5 812 km had been gravelled.

One of the ways of optimising the employment of labour was by balancing the various operations. In respect to gravelling it was originally estimated that the more equipment-intensive gravelling operation would be far more productive than the employment-intensive construction teams. The disparity in production estimates may be judged by the projection that a Unit would consist of three construction teams, one gravelling team and one structures team. The gravelling team would thus gravel the roads constructed by the three construction teams in the same Unit.

It was feared that the labour-intensive construction teams would struggle to keep pace with the relatively equipment-intensive gravelling team.

The gravelling operations of the Rural Access Roads Programme were planned to be carried out using labour for excavation and loading, tractors and tipping trailers for haulage and unloading, and then labour again for the spreading activity. The plan in itself was an employment-intensive form of gravelling and a radical departure from the contemporary equipment-intensive gravelling systems based on excavation by bulldozers, loading by dumpers, haulage and unloading by tipper trucks and spreading by graders.

Each Unit had a gravelling team consisting of four 75 HP tractors and eight five tonne tipping trailers. The original target was to gravel four km per month per Unit with a four metre wide gravel layer that would be ten cm thick after compaction.[22] By March 1979, only seventeen (17) percent of the newly constructed roads had been gravelled (1 463 km earth road constructed against 248 km gravelled[23]). Several reasons were given for the shortfall:

(a) delivery of tractors and trailers was severely delayed;
(b) the average haulage distance from gravel quarry to the site generally exceeded eight km,[24] the figure upon which production estimates were based;
(c) the equipment was under-utilised mainly due to unavailability of spares and welding equipment;
(d) inexperience of the operators;
(e) insufficient quarry organisation.

Other factors that contributed to the poor quarry organisation were as follows:[25]

(i) The tractor/trailer combination introduced at the end did not prove to be the optimum. Tractors bought before 1982 were Harvester International 444. Even though it was already obvious that these tractors were too light, after 1982 quite a number of tractors

[22] de Veen, 1983:127-131
[23] Ibid. p11.
[24] Although this was reported (de Veen, p45) according to the roads inventory compiled by Sir A Gibbs as part of the Gravelling Study (1984), for 55% of all RARs the haulage distance was less than 3 km. See also Illi, 1987:36.
[25] Personal communications: Edmonds to McCutcheon, 1985; Illi to McCutcheon, 1986).

were purchased of an even smaller type (HI 384). They turned out to be totally weak and powerless.

(ii) Not enough attention was given to design and workmanship of equipment:

Examples:

- Tipping system (trailer)
- Towing eyes (trailer)
- Tailgates (trailer)
- Hitches (tractor)
- Bearings (trailer)
- Hydraulic systems were not good.

(iii) Trailers were of inadequate quality.

(iv) Lack of diesel, tyres.

(v) Lack of discipline of operators.

On the one hand was difficulty with equipment; on the other, difficulty with the organisation of a complicated and demanding site operation. The latter meant that the level of site supervision training had to be increased. However, the former was a greater problem. In the first place there was an absolute shortage of equipment which immediately affected output projections, in second and third place the equipment entailed greater time and effort than anticipated on the part of both Headquarters and field engineers and, finally, this distracted the engineers from other matters.

To overcome problems (b) and (c) it was decided to provide the Units with six 45 HP tractors (instead of four 75 HP). Increased plant operator courses were carried out and the gravelling course for overseers was improved. The Department of Staff Training Unit at Kisii was the first to start separate quarry preparation sites in 1981. Output increased by 40 per cent after the introduction of these preparation sites.

By March 1982, the proportion of roads gravelled had increased from 17 to 35 per cent: 5 145 km of earth road had been constructed and 1 804 km gravelled.[26] While the proportion had increased, the *absolute* length which had not been gravelled had almost tripled. The reasons

[26] Data as at June 1979.

given for the shortfall were a variation upon the reasons listed above[27] and in addition, the Ministry's "inability to make timely payments for essential supplies, in particular fuel". The major remedies focused upon the improvement in the procurement, utilisation and operation of the tractors and trailers.

A great deal of the time and energy of the engineer and his staff were absorbed by the problems associated with keeping the equipment required for gravelling in good working order (mechanics, spares, fuel and so on). This must have happened at the expense of other aspects of the work (for example route alignment, location of gravel, and technical standards of construction, especially water crossings and mitre drains). The need for equipment must first be severely scrutinised during the planning of the programme, and then its performance needs to be monitored and reconsidered if experience is negative. By contrast, the employment-intensive component was forging ahead because, by its nature and approach, it was more isolated from the types of problems experienced using equipment.

3.2.7.3 Overview of alterations in the organisation and its structure

Over the years the location of the programme within Kenya's government bureaucracy altered, as did the organisational structure itself. Both reflected the extent to which the organisation became progressively more a part of the normal way that rural road construction and maintenance were carried out in Kenya. This took place in gradual stages. Initially, a Special Projects Branch was established within Ministry of Works Headquarters to accommodate the Rural Access Roads and Gravelling, Culverting and Bridging programmes.

In 1979, the posts of Regional Coordinators were created. The Programme's organisational structure then reflected the overall Ministry to Province to District organisational structure.[28] Also during 1979 the responsibility for the Programme shifted from the Special Projects Branch to the Construction Branch in the Ministry of Transport and Communication which had been

[27] For example, see Gibb/MoTC, 1984: Section 8 - 4.

[28]Ministry: Programme Coordinator - Senior Superintending Engineer
Province: Regional Coordinator - Engineer, Grade X.
District: Field/Supervising Engineer - Engineer, Grade Lower than X.

made responsible for all roads. In this way, the Programme had become increasingly integrated into the sectoral organisation responsible for roads.

During 1984, the government's implementation of its "district focus" policy began to undermine the strong sectoral links to the Ministry. The effect on the programme was twofold. Implementation of the programme through the District Engineer's office - which then became the official institution responsible for road maintenance at the district level - ensured that the Programme continued as part of the normal way of constructing and monitoring rural roads. However, the slackening of the importance of the Provincial Engineer's office in this respect seriously undermined the role of the regional coordinator. This was unfortunate, as in the period 1979 to 1984 the Regional Coordinator had become increasingly important both as regards coordination of Unit operations but also as regards the funnelling of properly checked information through to Headquarters in Nairobi.

In sum, the policy of "district focus" has the highly commendable purposes of decentralisation of an over-centralised system. But it disrupted a system which had a balance between the degree of decentralisation necessary for proper community participation in decision making and the appropriate level of centralisation necessary to run a national programme of this scale.

The 1975 plan stated that maintenance of roads constructed under the programme would be the responsibility of the Maintenance Branch of the Roads Department. Even the decision as to whether maintenance should be carried out by plant intensive or labour-intensive methods was to be based on the results of trials to be carried out during 1975 and 1976.

When it became apparent that the Maintenance Branch was not going to maintain the roads, a simple system of maintenance based on "lengthmen" was introduced. But little attention was paid to what these "lengthmen" were doing.

By 1984, about 5 000 people were employed on maintenance and about 9 000 on construction. By the same period, the growing recognition by the Programme Coordinator and his advisors of the need to pay more senior attention to maintenance had been submerged by the day-to-day demands of the efforts to remove the gravelling backlog.

3.2.7.4 The Role of the Engineer

A major change from the original proposals was the decrease in the number of Units which an engineer was thought capable of controlling. From this the conclusion is that qualified engineers have only been twenty-five percent as effective as originally envisaged. However, rather than being a question of ineffective engineers, it is more an indication of the inexperience of the planners in relation to the following complex of factors:

(i) the nature of employment-intensive work;
(ii) the organisation structure of the Unit;
(iii) the complications arising from the use of equipment;
(iv) the complexities and time consuming nature of the reporting systems; and
(v) the lack of any specific training for engineers.

The engineers were not acquainted with the overall nature of employment-intensive work, less the technical details. In addition to being required to manage large groups of workers, the engineer suddenly found himself dealing with local political and social dimensions.

On paper, the organisational structure was sufficient for its proper management. In practice, the posts were staffed with people who were unable to carry out their responsibilities adequately, either through lack of training and experience, or because they did not have the requisite status to authorise requisitions or handle payments of goods and wages. The standing orders governing financial transactions and official accounting procedures stipulated a certain minimum for both job qualifications and grade within the civil service. Although people were employed for the clerical work they seldom fulfilled both criteria. Usually the engineer was the only one with the requisite civil service rank. In practice, therefore, the engineer became saddled with excessive paperwork that required his personal signature. Since this signature meant real (legally enforceable) culpability if anything went wrong, the engineer had to devote a lot of time and effort to making absolutely sure that the funds were properly disbursed and accounted for. While the engineer should have been ultimately responsible, the officials responsible for handling procurement and disbursement should have been sufficiently tied into the system that they

carried a greater personal burden. In such a case the engineer would have only needed to carry out spot-checks. This was not the case: constant vigilance was imperative.

To this personal accountability for the cash (with the very real threat of incrimination) must be added the difficulties engendered in relation to disbursement of funds from Ministry Headquarters to the Districts was riddled with problems. Eventually these methods were streamlined and alternative stand-by systems were set up. But this only occurred after considerable pressure by the major Donors at the highest level within the Ministry (at Personal Secretary level) in order to achieve proper cash flows.

In addition to the paperwork required for the accounting system, there was the paperwork required for the procurement systems. In particular, the whole process of getting the equipment and keeping it going absorbed an enormous amount of direct involvement on the part of the engineer. Added to both of these was the time and effort required by the reporting and monitoring system. Most engineers complained that it took up an inordinate amount of time. The whole question of the reporting system is dealt with in greater detail in the succeeding section.

Finally, in this discussion of the reasons for underestimating the number of Units that could be controlled by one engineer, we must add the lack of specific training for engineers, both expatriate and Kenyan. Thus, the engineers had to absorb the detailed functioning of the programme by osmosis. The Technology Unit may be criticised for not having foreseen the need to train engineers as it did not produce any training material specifically aimed at engineers.

3.2.7.5 Management and Reporting

Several other difficulties were experienced within the organisation. In part these difficulties stem from the very organisational flexibility. A flexible change “here” had an unanticipated effect “there”. Mostly, the difficulties stem from a change in focus from an experimental project where the main questions relate to justification of the programme, to a national programme where the main questions related to the most sensible way of implementing things on a large scale. However, this distinction was not recognised at the time. It is particularly apparent in relation to two further aspects of organisation:

Senior (Headquarters) Management; and Reporting, Monitoring and Control.

•Senior Management

The extent to which the Headquarters workload for a national programme was not clearly defined at the beginning of the expansion from the pilot stage may be seen by the absence of clear job descriptions for the upper echelons of the programme. The serious shortcoming was in the post of Planning, Monitoring and Control (occupied by an expatriate) and other senior supervising engineering posts (Equipment and one of the Regional Coordinators based in Nairobi).

•From a Reporting System to a Management Reporting System

The original reporting system was based on the collection of detailed information on every aspect of employment-intensive work. The system served several purposes:

(i) to establish planning values for employment-intensive activities;
(ii) to be able to compare productivities for labour-intensive activities with those for alternative equipment-intensive systems;
(iii) to control site activities by comparing actual daily productivities with the planning values.

Thus, the reporting system was set up as a long-term information gathering system *and* a site control system.

During the first few years the collection of detailed information was legitimate: on the one hand it was necessary to establish the planning values and be able to compare them with equipment, and on the other, one of the most innovative features of the programme was the use of planning values for every activity to control site work very tightly. For example, productivities were established for five grades of soil hardness. The detailed reporting system for the pilot stage was expanded for the national programme. The volume of paperwork increased proportionately. The quality of information collected decreased as the engineers originally responsible for the

measurement and collection of data moved into management. But by the time the programme went national, rationalisation was necessary.

At the same time, other information was required by Headquarters management, donors and researchers, which resulted in an ad hoc addition to the reporting system. It was easier to add a form to the system than to modify an existing form used throughout the country, which inevitably led to duplication. It was not realised that the collation of a base amount of material on every conceivable activity conflicted both with an original objective of proper site control, and also with the objectives of a reporting system appropriate to a national programme.

All engineers regarded the reporting as excessive. One engineer stated that he had spent four times more work on completing the reports than he had on getting the equipment operational.

By imperceptible stages the reporting system deteriorated until by 1986 the major criticisms of the system were:

(a) too much data was collected that was no longer essential for both site and material control;
(b) they did not define targets for progress, cost and productivity in construction;
(c) cost reporting at District level was incomplete and lacking a clear statement of accounting practice;
(d) the forms used for written reports were repetitive and sometimes confusing;
(e) there was no clear statement of the responsibility at the various levels in the management structure to receive reports and how to act on them; and
(f) the production of progress reports consumed a significant proportion of staff time at Headquarters.

Should a new system result in too much *unchecked* data being forwarded to HQ there would not be an improvement in the reporting system even if new techniques were installed for processing the information. Implications of *checked* data are that thought and experience should be brought to bear upon the data processed and not just a clerical copying from one sheet to another.

The emphasis in a new reporting system must be on the delineation of the information required at each level in the organisation (site, District, Regional Coordinator, HQ Planning and Engineer, Programme Coordinator) in order to:

(1) monitor the progress of the work (sufficiently quickly to be able to correct it if something has gone wrong); and
(2) record the necessary information required for internal and external reports.

3.2.8 Conclusions

(i) The programme has demonstrated the technical feasibility and economic viability of constructing roads employment-intensively without compromising quality, cost and time. By any standard, the KRARP is exemplary and therefore should be used as a barometer for evaluating any future employment-intensive infrastructure programmes. Success factors for the programme may be summarised as follows:

- Programme was long term (about 12 years from inception to closure in 1986) and not *adhoc* individual projects;
- Good preparation taking into account technical, administrative, management, organisation, planning, training material development, institutional and socio-economic issues;
- Pilot and demonstration projects combined with initial training;
- Individual, community and institutional capacity building;
- Good management, supervision, recording, reporting, monitoring and control;
- Training was extensive and relevant;
- Long term political support;
- Long term financial commitment;
- Balance between centralisation and decentralisation, as well as coordination between communities, projects, programme and institutions
- Programme was treated as serious engineering, not an emergency or relief project.

(ii) Like any other successful projects or programmes, KRARP had its own problems. Analysis indicated that the Kenyan Rural Access Roads Programme was adversely affected by intellectual and analytical shortcomings, technical miscalculations, administrative and management realities, and political interventions:

- Intellectual and analytical shortcomings: for example, overestimation of the ultimate size of the programme and the speed at which it could be built up; over-confidence in the management capacity of the engineers, combined with an unrealistic expectation of what could reasonably be carried out by one person; lack of recognition of the need to train engineers.
- Technical miscalculations: the gravelling operation was one third as productive as estimated; the reporting system set up to control work also produced data to modify estimates of required labour inputs for various tasks and to provide comparisons with equipment (as such it became too detailed for the control of a national programme); attention to the vertical alignment of the road gradually slackened.
- There was no initial maintenance management plan during the design of the programme, probably due to lack of funds;
- To date, no reliable, conclusive impact study has been conducted despite realisation of development objectives such as increased daily traffic counts; reduced travelling time and greater agricultural outputs. According to Mambo (2005), an attempt to carry out impact study between 1979 and 1984 was abandoned. Data collected were never analysed in many cases, and preliminary conclusions reached lacked validity as it was difficult to assign causality to the Rural Access Programme and contribution to GDP;
- Administrative and management realities: difficulties were experienced with procurement, lack of standardization and cash flow; the amount of management required to operate the more equipment-intensive haulage system was completely underestimated; and
- Political interventions: “district focus” affected the organisational structure particularly the role of the Regional Coordinator.

From the point of view of future programmes three of the points that need stressing at the policy-making level are:

(a) The length of time to establish the programme, i.e. probably three years before there are significant "scratches on the earth": from early pilot to early expansion;
(b) The high proportion of overheads during this phase: it is better to warn of these before the start of the programme than to risk there being no continuation beyond a pilot project because of the high overheads experienced during the pilot project being projected into the future by inexperienced planners;
(c) The probability of a reasonable rate of expansion after the pilot project with progressively reducing overheads as long as the correct training, funding, and planning, have been carried out; yet to guard against expanding too rapidly.

In closing it is worth re-iterating the World Bank's overall conclusion about the programme:

> *Considering the institution building requirement, the staffing and related training need, administration and supervision required for the size of the programme, this has been one of the most successful donor financed programs in Kenya and one of the best organized labour intensive road construction programs anywhere.*[29]

Whatever problems have been discussed above should be viewed against this background of significant physical achievement and international recognition as such. The problems have been highlighted in order to ensure that the Programme remains as vital as it has been and to illustrate, through example from a successful programme, the sorts of difficulties likely to be encountered by any other programme.

[29] World Bank,1986.

3.3 The Minor Roads Programme

3.3.1 Introduction

In 1987, the government of Kenya formally upgraded the Rural Access Roads Programme to the Minor Roads Programme. The focus of the latter was the maintenance of those access roads constructed between 1974 and 1986 and the improvement and maintenance of parts of the classified road network, those formally classified as C, D and E roads. The Minor Roads Programme (MRP) was therefore a transition from construction of rural access roads to maintenance of the low-trafficked and deteriorating secondary and minor roads, was set up as a parallel institution within the Ministry of Roads and Public Works. This attracted lots of resentment from the parent Ministry, though payment certificates could be processed relatively easily.[30]The use of labour intensive methods of construction and maintenance on the classified road network was a major breakthrough. By 1988 over 5 000 contractors were employed on maintenance, and since the de facto start of such maintenance in 1977, during the construction phase as noted above, by 1988 over 30 000 man-years of employment had been created on maintenance alone.

3.3.2 Programme Objectives

The principal objectives were to maintain about 12 000 km of road and improve over 4 000 km of roads that were in bad condition. Disaggregated, the MRP had six objectives (Mambo, 2005), namely to:

- Allow easy mobility of people and transfer of agricultural produce from farms to market centres
- Offer employment opportunities to the rural population
- Improve access to social and administrative facilities as a basis for overall improvement of living standards

[30] Personal Communication, Goss to Quainoo, 2006. Mr E. Goss is R2000 Technical Advisor at Kenya Roads Board, Nairobi, seconded from DANIDA

- Institutionalise the employment methods of road construction within the Ministry of Public Works
- Raise the standard of living of the rural poor by increasing income earning opportunities and attaining a higher satisfaction of basic needs
- Bridging the accessibility gap between rural access roads and national trunk roads system thereby linking local people to wider social amenities such as schools, clinics, agricultural extension services, markets and job opportunities.

3.3.3 Implementation Strategy

With clear definition of roles and responsibilities of programme participants, an in-house manpower or force-account delivery approach was adopted in maintaining the roads employment-intensively. Arguably, this method is unsustainable; however, the MRP was very successful. Excavation was done by hand; the only equipment on site was tractor and trailer.[31] It developed systems (including setting up an international school for training programme staff in employment-intensive methods), and the programme was implemented in 30 districts (out of 45) mostly in the arable parts of Kenya – excluding the Northern Province. Initial planning was done on individual road links but soon it was realised that such was not cost effective: it becomes an island, since connectivity of other rural areas to higher class roads remain unresolved.

3.3.4 Achievements

Two projects (in Nyanza Province and Coast Province) under the MRP, funded by DANIDA, were evaluated and reported by I.T. Transport Ltd, U.K. in 1997. Major findings indicated that the two projects were successful, and both achieved and exceeded their immediate objectives: high standard roads were constructed employment-intensively at reasonable costs and altogether created over (five) 5 million workdays of employment (DANIDA and IT Transport, 1997). In addition, an efficient routine maintenance system was established, fully funded by the government of Kenya.

[31] Ibid.

In sum, the achievements of the Minor Roads Programme are:

- Establishment of a labour-intensive methods training centre at Kisii in 1984 to cater for all training needs of the programme at national, regional, contractor and supervisory levels.
- Over 45 000 km of minor and secondary roads were improved, besides maintaining the rural access roads from 1987 to 1997.
- Twenty-three contractors were trained (through SIDA support in the Central and Eastern Provinces of Kenya between 1993 and 1997).[32]
- The MRP created employment of 2500 – 3000 man-days per kilometre of gravelling and roads improvements.[33]

Other benefits documented by DANIDA and IT Transport (1997) were as follows:

(i) Improved access to markets, and general trading
(ii) Improved provision of, and access to social welfare services
(iii) Improved social integration
(iv) Increased employment opportunities because of the labour-based emphasis of the programme

3.3.5 Problems and shortcomings

- The MRP was not as successful as the KRARP partly because lessons learned from the KRARP were not factored into design and implementation of the programme.[34] Difficulties with timely procurement of equipment and administrative challenges associated with release of funds from headquarters to district levels, experienced under KRARP, remained persistent even in the Minor Roads Programme. Higher costs per kilometre of road maintained without

[32] Ministry of Roads, Public Works and Housing, 2004. Towards Cost Effective Road Maintenance in Kenya: Enhancing Use of Labour Intensive Roads Works in Kenya. Roads Department memo.
[33] Personal Communication: Karanja to Quainoo, 2006. Mr. FD Karanja is the Chief Superintending Engineer, Ministry of Roads and Public Works, Nairobi, Kenya
[34] Personal Communication: Muthua to Quainoo, 2006. Mr. S. Muthua is ILO Technical Advisor in Nairobi, Kenya.

commensurate improvement in standard were due to inadequate supervision, monitoring, and inappropriate material selection.

- By 2000 most of the road network was in bad condition. Reasons range from lack of road maintenance policy probably due to contraction of Kenya's economy and financial problems, lack of road condition inventory survey and to severe rainfall. Analysis indicated that road maintenance using the force account delivery method was not sustainable.[35] No work was put out to contract. Thus, the 23 contractors trained for the labour-intensive work through SIDA were initially abandoned. Consequently, several of these contractors changed to use equipment based methods.

- On the part of the government, there was no sustainable source of finance to execute the maintenance programme. As a result, MRP was limited to routine maintenance, neglecting any major maintenance.

- Donor funding came with conditions and restrictions. Withdrawal of funding often caused undue payment delays. Thus government funding is indispensable to the success of any poverty reduction infrastructure programmes. In addition, withdrawal or suspension of funding implied no maintenance operations carried out, and further deterioration of road network.

- Of the 23 contractors trained during the period 1993 to 1995, who later abandoned labour-intensive methods to use machines because of lack of engagement, only 25% survived after five years. Despite the shift from being labour-based to machine-based contractors, submission of unrealistic tenders was commonplace.[36]

- Absence of government policy or strategy on how to keep trained contractors engaged. Tenders were not specified as employment-intensive works only, they continued to be capital-intensive. Thus, there is no preferential treatment for

[35] Personal Communication: Muthua to Quainoo, 2006. Mr S. Muthua is ILO Technical Advisor in, Nairobi, Kenya
[36] Personal Communication: Karanja to Quainoo, 2006. Mr. FD Karanja is the Chief Superintending Engineer, Ministry of Roads and Public Works, Nairobi, Kenya

labour-based contractors; pull back becomes almost inevitable. Work packages should be prepared to suit employment-intensive methods.[37]

3.3.6 Conclusions and Recommendations

- The effective use of employment-intensive methods for road maintenance and spot improvement, supervision and management demonstrates the possibility and sustainability of the non-conventional but appropriate method of construction[38] for basic infrastructure provision and reduction of unemployment and poverty.

- Local or government funding is crucial to the sustainability of employment-intensive approaches to infrastructure provision. Sustained poverty reduction, via employment creation in construction, needs unilateral government commitments to succeed. Donor funding should only be regarded as bonus.

- Donor-driven programmes are not sustainable, because when there is a pull-out, the government is often not ready to take over and the programme is then either discontinued or put on hold.

- Planning and implementing individual connectivity of rural roads to higher classified roads is not cost-effective. Integrated planning holds the key.

- Once good roads are constructed, adequate funding must be committed for maintenance. In particular, sufficient funding for timely routine maintenance should be prioritised to avoid road network deterioration.

[37] Ibid.
[38] DANIDA and IT Transport (1997) Evaluation of Minor Roads Programme, Kenya

3.4 Roads 2000 Programme

3.4.1 Background

Despite the strong economic performance recorded over three decades, Kenya's economy contracted in 2000 (Muthua, 2006). Reasons for the poor performance, among others, were poor implementation of economic policies, mismanagement and weak institution of governance (Government of Kenya, 2003). The economic under-performance had serious socio-economic consequences: unemployment was over 14.6% of the officially declared working force, with the youth accounting for forty-five (45) percent of the total; the majority of the unemployed were with no employable skills despite basic education received; the level of poverty rose from forty-eight (48) percent in 1990 to fifty-six (56) percent in 2001 (Government of Kenya, 2003). Another effect was years of neglect of road network maintenance resulting in rapid deterioration. The government concluded that employment creation was the most effective way to stop the increasing level of poverty. As a first step the Government of Kenya integrated all roads system which resulted in MRP and Ministry of Roads and Public Works being placed under one institution.[39]

Impressed by the high standard of road constructed and maintained under the Rural Access Roads and Minor Roads Programmes, which were of better standard than higher class roads in many areas, one of the recommendations through the Road Maintenance Initiative was to use the employment-intensive experience to maintain the higher class feeder roads and some paved roads, and increase the use of local resources in road maintenance (Ministry of Roads and Public Works, 2001a; 2005a). Therefore, following the GoK's National System Strategic Plan, 1990 - 2000, the Road 2000 concept was conceived in the early 1990s.

Appropriate technology was to be applied for road network selective rehabilitation, spot improvement and routine maintenance.[40] Trial projects under the R2000 using force-account were implemented in parallel with the MRP, followed by a complete take over with the introduction of partial rehabilitation and spot improvements. The two-fold economic recovery

[39] Personal Communication: Goss to Quainoo , 2006. Mr. E. Goss is R2000 Technical Advisor at Kenya Roads Board, Nairobi, seconded from DANIDA

[40] Ministry of Roads and Public Works, 2001b. The Roads 2000 Strategy, Republic of Kenya.

plan aimed at employment creation (to reduce increasing poverty) and economic expansion (Ministry of Roads and Public Works, 2005b). The idea was to extend the labour-based approach to maintaining entire road network by 2000. However, because of corruption, widespread procurement fraud in the delivery of infrastructure, absence of efficient public sector financial management and accountability, lack of transparency, lack of good governance and institutional decay, major donors in Kenya's road infrastructure programme froze financial support. Without sustainable development revenue for new investments, the withdrawal had serious implications for road maintenance: only routine maintenance was carried out, there was no major maintenance work.[41] Over a decade (since 1990) three government Strategic Plans had been produced but without implementation. To redeem the economy and redress unemployment, the government embarked on a five-year economic recovery action plan to accelerate growth and reduce poverty (Government of Kenya, 2003). The hub of the plan was employment creation through sound macroeconomic policies, improved governance, efficient public service delivery, an enabling environment for the private sector to do business, and reduced cost of conducting business.[42]

Around 2000, the Road 2000 plan was revisited culminating in institutional strengthening and establishment of the Kenya Roads Board as well as the Fuel Levy Fund. This was preceded by a road condition inventory survey, monitoring and evaluation of training offered in conjunction with Kisii Training College, and preparation of contract documentation.

3.4.2 Objectives of the R2000 and indicators of success

The immediate objectives of the poverty- reduction focused Roads 2000 programme (Ministry of Roads and Public Works, 2005b) were as follows:

(i) To bring back the classified road network to an acceptable level of accessibility and maintainability through the use of appropriate technology and locally available resources

[41] Personal Communication: Muthua to Quainoo, 2006. Mr Muthua is ILO Technical Advisor in Nairobi, Kenya.
[42] Government of Kenya, Ministry of Planning and National Development (2003). Economic Recovery Strategy for Wealth and Employment Creation (2003 – 2007).

(ii) To promote the use of the private sector (particularly small-scale contractors) for road infrastructure works

These objectives were to be pursued through the following strategies:[43]

(a) Planning road work interventions based on an integrated road network approach rather than prioritised areas
(b) Routine maintenance and spot improvement works
(c) Use of local resources as much as possible
(d) Use of employment-intensive methods of work where these are cost effective
(e) Partnership with the private sector, with focus on small scale contractors for spot and routine maintenance

In addition to the technical aim of improving road conditions, the programme, according the Ministry of Roads and Public Works (2001b) was expected to yield socio-economic benefits such as (i) 60% of total periodic maintenance costs going to labour in the form of wages to alleviate poverty; (ii) significant employment creation: at least 20 000 long-term casual employment and more than 5000 short-term employment for improvement works per annum for the rural population; (iii) increase in female involvement in the programme, from 4% to at least 20%; and (iv) encouragement of local manufacture and maintenance of hand tools and simple equipment for road maintenance. Planning and coordination of the programme was centralised at the headquarters in Nairobi, but the Provinces were to coordinate the R2000 operations in districts under their mandate in technical issues like preparation of work-plans, contract management and quality assurance.[44]

In order to define the R2000 strategy, the above objectives were modified with indicators of success, risks and assumptions documented in the Roads 2000 Road Maintenance Strategic Plan 2005 – 2010.[45] Based on the vision to achieve and sustain excellence in road maintenance that contributes to poverty reduction and wealth creation through reduced transportation costs, use of

[43] Ibid, p1
[44] Ministry of Roads and Public Works, 2001b. The Roads 2000 Strategic Plan. Government of Kenya
[45] Ministry of Roads and Public Works & Kenya Roads Board (2006). Roads 2000: Road Maintenance Strategy – Strategic Plan July 2005 – June 2010. Republic of Kenya

employment-based methods and optimisation of local resources (Ministry of Roads and Public Works and Kenya Roads Board, 2006), nine objectives were formulated. The revised objectives were:

1. To sustain cost effective maintenance of maintainable roads
2. To increase the maintainable road network by 10% annually during the planning period
3. To provide all season road access within 2km to 80% of the Kenyan population by the end of the planning period
4. To increase the use of local resources including Small and Medium Size Enterprises, materials, tools and equipment in road maintenance
5. To create a minimum of 150 000 part-time jobs (equivalent to 35 000 full-time jobs) annually during the planning period
6. To adopt the R2000 strategy nationally by 2008
7. To ensure that all cross cutting issues such as road safety, gender equity, environment, health concerns, workers' rights and good governance are included in all road works
8. To facilitate research and development of new cost effective road maintenance approaches
9. To develop and implement effective and efficient planning, monitoring and evaluation mechanisms

Under the defined Roads strategy, labour-based methodologies would be mainstreamed and applied on the entire road network. Central to the mainstreaming are promotion of local resources usage and employment creation (Ministry of Roads and Public Works and Kenya Roads Board, 2006). Implementation of the strategy would be funded from the Roads Maintenance fuel levy.

3.4.3 Programme Implementation

Given the high wage-bill and lack of sustainable revenue to pay workers, the structural adjustment programme, and donor demands in the 1980s resulted in a big push for privatisation via a contractor based system. A shift from force account to contracting implied retrenchment of

a large pool of trained personnel and technicians. A pilot project implemented in two districts was preceded by a study and analysis of existing road maintenance status quo, commissioned by the Kenyan Government (Ministry of Roads and Public Works, 2001a). The study identified the following principal problems:(i) lack of sufficient funds for road maintenance; (ii) inadequate plant management due to lack of maintenance funds; and (iii) unsatisfactory execution of field work because of reliance on permanent staff and force account operations, and (iv) lack of rational planning, reporting and monitoring procedures.

Initial financial support was given by UNDP and ILO to the Kenyan Government to forge ahead with its economic recovery strategy and employment creation. The purpose of the support was to assist in the development of various implementation tools such as training manuals for programme staff and the private sector including small-scale contractors for the R2000 programme. Consequently, a general (comprehensive) training plan for R2000 was drawn up to ensure consistency and effectiveness of training imparted to programme participants.
The significance of the R2000 Training Plan was to guarantee the following:[46]

(i) All projects contributing to Roads 2000 follow a standardised training approach
(ii) Training is managed through a permanent and recognised institution
(iii) Training interventions are standardised and of the required quality
(iv) Training is provided by training institutions that have the required expertise and capacity
(v) Funding for training is guaranteed
(vi) Training is recognised through accreditation and adequate quality assurance

Financial assistance were also contributed by several donor agencies (such as DANIDA, ADB, SIDA, KFW, EU) while ILO provided technical support by developing training and putting together contract documentation. Figure 4 illustrates the donor agencies contributions in addition to Kenyan Government's funding provided, each indirectly indicated by provincial scope of work. One good aspect about Government of Kenya's contribution is the realisation that dependence on aid money is not sustainable. Pictorially Figure 3.3 depicts the extent of government's involvement as approximately 70% coverage and the remainder, a shared

[46] Ministry of Roads and Public Works, 2005b. General Training Plan, Roads 2000, Republic of Kenya.

coverage, by six donor agencies. However, the northern sector of the country is predominantly semi desert and therefore extent of road network maintenance is not comparable with that of the southern sector both by scale and funding requirements.

The training plan, which was preceded by an in-depth training needs assessment, included monitoring and evaluation of training; accreditation; costs analysis and funding requirements. Organisational charts were also developed for various levels and hierarchical structures of government departments to implement road rehabilitation and spot improvements using contractors. This was followed by the description of position, scope of work and specification of tasks for each programme participant (Ministry of Roads and Public Works, 2005b). In addition, appropriate contract management tools and employment-intensive procedure manuals were designed. Training courses, targeted at programme managers, consultants, engineers, technicians, contract managers, supervisors and contractors and foremen, in relevant fields to the programme were jointly offered by ILO and Kisii Training Centre in Kenya.

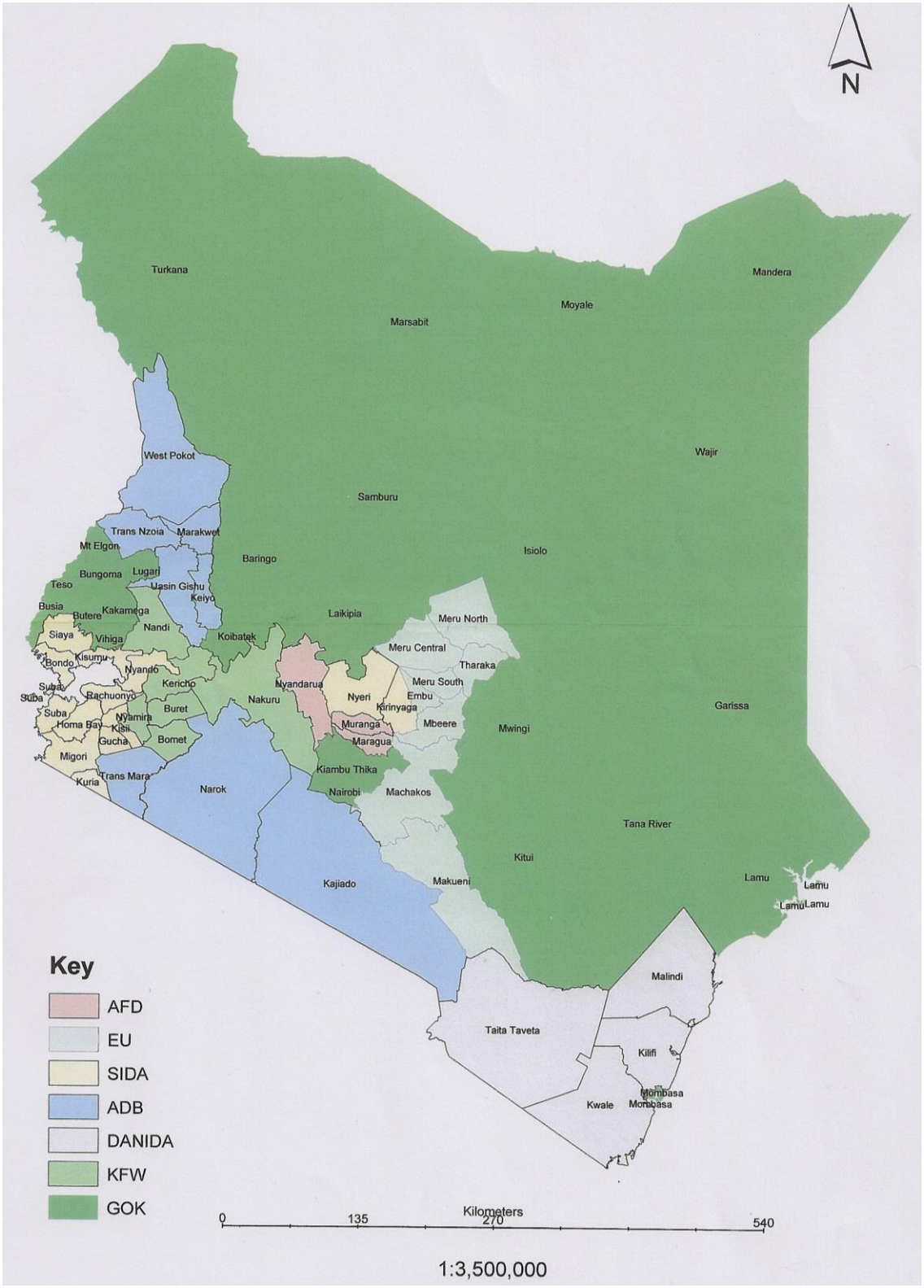


Figure 3.3: Kenya: Roads 2000 Coverage by donors

Source: Kenya Roads Board, 2006

National coordination of the training programme was under the jurisdiction of Kisii Training Centre (Kisii Training Centre, and Orwa, 2005); the objective was to train a total of 4440 participants at a cost of approximately Kshs 337 million.

Classroom training in both relevant technical and management courses was to be complemented by field trial contracts whereby contractors are offered a three to five months road rehabilitation project of length 4 – 6 kilometres (Kisii Training Centre, and Orwa, 2005). The objectives of the practical component of the training course are twofold: (i) to provide the contractors and site supervisors an opportunity to apply knowledge and skills gained in real-life contracts; and (ii) to enable contract managers, consultants and supervisors exercise their contract managerial functions in practical terms in areas of field assessment to determine scope of works, estimating and costing of works, preparation of contract documents; management of tendering process; and contract management and administration.[47]

The R2000 programme was first piloted successfully (1992 – 1994) to test techniques and procedures for road rehabilitation, spot improvement and maintenance on classified road network and gather lessons in two districts,[48] Kericho and South Nyanza. According to Ministry of Roads and Public Works (2001b) casual labour gangs were employed. Analysis by Goss and Karanja (2005), however, indicated that the force account system was used during the pilot phase for partial rehabilitation, maintenance, and spot improvement. Maintenance operations on unpaved roads drew extensively on new techniques developed specifically for the pilot project and did involve use of locally manufactured tractor drawn graders (Ministry of Roads and Public Works, 2001b). In relation to the unpaved road network, emphasis was placed on patching, localised sealing and off-pavement operations in addition to limited routine maintenance. Trial projects, funded by EU, SIDA, KFW and DANIDA, were generally successful.[49]

[47] Ibid, p9
[48] Personal Communication: Gitau to Quainoo, 2006. Mr. S. Gitau is the Senior Superintending Engineer at Ministry of Roads and Public Works, Nairobi; & Ministry of Roads and Public Works, 2001b. The Roads 2000 Strategy, Republic of Kenya.
[49] Personal Communication: Goss to Quainoo, 2006. Mr E. Goss is R2000 Technical Advisor at Kenya Roads Board, Nairobi, seconded from DANIDA

Based on the pilot projects, the following conclusions and recommendations were put forward (Ministry of Roads and Public Works, 2001b):

- *It was possible to use labour-based methods in the maintenance of the carriageway and ditches of the maintainable low-trafficked rural roads. Hence labour-based methods should be used on maintenance of all low trafficked rural roads where labour was in abundance.*

- *Roads which were poor and not maintainable could rapidly be rehabilitated by tractor drawn graders supported by labour. It was therefore necessary to expand the use of the tractor towed graders for rehabilitation works.*

- *Highly trafficked roads could effectively be graded by use of towed graders, while the drainage systems were best maintained by the use of labour which was to provide the more appropriate trapezoidal ditch cross sections. Where feasible, it was necessary to use towed graders for grading purposes.*

- *Compaction was necessary on the highly trafficked roads during the grading or rehabilitation operations. It was important to include compaction in maintenance of heavily trafficked roads.*

- *People retiring from the public service could be re-engaged as casual labourers to provide the much needed skills in labour-based technology.*

Big contractors presented several staff to be trained at supervisory level. With Kisii Training Centre as implementation partner, nationwide replication covered 37 districts out of 72, but rollout was on course because of government inputs. Under the R2000 maintenance programme, operations were unpacked as follows:[50]

(i) Road Improvement Works: this involved partial rehabilitation and spot improvement contracted out in reasonable packages to match capacity of local

[50] Ministry of Roads and Public Works, 2005b. Roads 2000 General Training Plan. Republic of Kenya.

small-scale contractors. Accordingly, possible contracts were (a) labour only, for drainage opening and reformation of carriageway on low-volume roads; (b) rehabilitation grading contracts for reformation of roadway – excluding drainage structures – on high-volume roads; (c) light grading contracts for routine maintenance; (d) gravelling contracts for roads sections requiring re-gravelling; and (e) spot improvement contracts – which includes rebuilding of road sections, culvert laying, structure works and spot gravelling.

(ii) Routine Maintenance: this comprised work on drainage and carriage way, 20 – 40 km road network contracted out to 'one-person' contractor[51] who then hires a few labourers. The contractor is obliged to provide labourers with required hand tools and at least a bicycle to transport the supervisor to site.

(iii) Emergency maintenance: unforeseen poor road conditions arising from situations such as landslides, rock-falls, and washed-away bridges demand quick maintenance interventions. In view of the inherent delays in the contract procurement system, the Roads Department was required to retain a small but well equipped unit of personnel and equipment for timely response to emergencies.

[51] This one-person contractor may be a business person or a community group regardless of sex

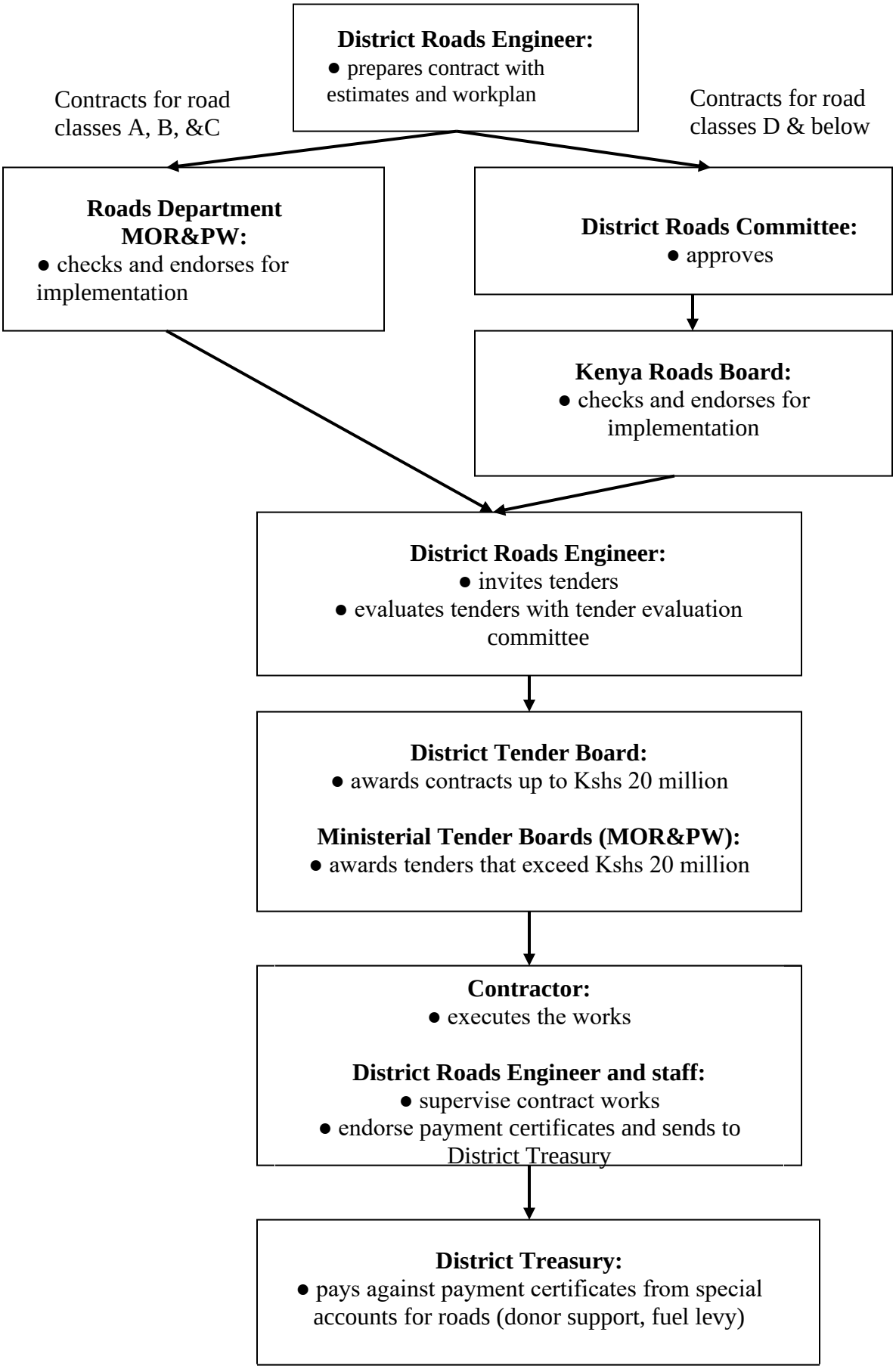


Figure 3.4: Arrangement for Improvement and Routine Maintenance Contract works
Source: Ministry of Roads & Public Works, Kenya, 2005b

Figure 3.4 shows the organisational process for award of contracts for road improvement and routine maintenance activities. It gives a typical example of arrangements put in place to ensure that projects completed are on time and within budget. However, bureaucratic delays (including procurement procedures) often translated into late completion and in some circumstances abandonment of contracts.

With the advent of a new Government and new goodwill in 2002, the Roads 2000 strategy was revisited in 2003. First, a strategic plan was developed to identify all the missing things. Four development partners came on board, each funding specific regional R2000 components: SIDA (Nyanza Province); ADB (Rift Valley); KfW (Rift Valley); and AFD – the French – (Central Province). The second stage was the development of a Roads 2000 manual. Quarterly coordination and annual steering committee meetings to discuss problems and possible solutions culminated in update of the original R 2000 manual to operations manual, drawing of general training plan and contract documentation.[52] Thus a common training manual for all contractors in the country to allow for standardisation was developed. In the R2000 plan, it was envisaged that 2% of total programme or project costs should go into training. However, the training fund of Kshs 250 million was never accessed and therefore no training was conducted; all went into road works.

One major problem was the source of funding and the consequent construction methods applied to spot improvement. For example, if money comes from the government, Ministry of Roads and Public Works just uses machine-intensive methods of construction due to easy start-up whereas on donor-funded projects employment -intensive methods were enforced. According to Goss (2006), the challenge for the government is to build a new cadre of labour-based contractors; and the key is to institutionalise contractor development (independent of donor funding).

[52] Personal Communication: Goss to Quainoo, 2006. Mr. E. Goss is R2000 Technical Advisor at Kenya Roads Board, seconded from DANIDA & Personal Communication: Karanja to Quainoo, 2006. Mr. FD Karanja is the Chief Superintending Engineer, Ministry of Roads and Public Works, Nairobi.

Table 3.4: Outcomes of three Roads 2000 projects

	Programme Description	Positive features	Negative features
1	R2000 Pilot Project: 92-94 Force Account Partial Rehabilitation, maintenance, spot Improvement	+ New strategy proved + Employment created + Roads for access + Network approach + Integrated into ministry structure + 4% training levy + Sliding scale – increasing Government of Kenya (GoK) funding	- Project - Donor funded - Heavy towed grader - Roads 2000 manual not completed - Strategy did not take off
2	R2000 Nyeri IKirinyaga projects (Central province) 1997-2004 Utilised both force account & contractors SIDA funded	+ Employment + Improved Network 60% + Integrated in District Ministry structure + No parallel systems + Training, Capacity Increasing GoK funding – Road + Maintenance Fuel Levy Fund (RMLF) + Soil conservation + Trained 23 maintenance labour-based contractors	- Donor Project. - Delay in funds - Trained contractors not utilised - No routine maintenance contractors - Impact not documented - No national system
3	R2000 Coast Province Project 1999-2003 Utilised both force account & contractors DANIDA funded	+ Employment. + Improved network by 60% + Integrated into district ministry structure + No parallel system + Training resulting in capacity Development + Increasing government funding – RMLF + Trained 110 routine maintenance Small-scale contractors	- Donor Project - Delay in funds - No improvement of contractors - National systems - project systems developed
4	R2000 Eastern Province Project 1997-2004 Improved links instead of network, mainly with machine based Contractors EC funded	+ High quality roads + Value for money contracts + Materials testing + Labour-based improvement contractors used for last contracts	- Donor Project - Delay in payments - Slow implementation - Little network improvement - Not district based - No training - No capacity built - No national systems

Source: Goss and Karanja, 2005

Since the end of the pilot phase, three Roads 2000 projects were implemented in three provinces between 1997 and 2004, namely: Central Province, Coast Province, and Eastern Province. These projects were funded by SIDA, DANIDA and EC. The first two projects used both force account and contracting systems in parallel (Goss and Karanja, 2005). On the contrary, the Eastern Province project, funded by EC for improving road links was predominately machine intensive through contractors. The authors summarised the three Roads 2000 project outcomes as successful, though not without shortcomings as captured in Table 3.4.

As at December 2006, phase two of the R2000 (2002-2003 and 2004- 2005) was underway, with implementation covering all 71 districts. Some new projects were also identified and added to the *shopping list* pending the availability of funds. This was the case for most of the 2004/05 projects.[53] Since 2004, routine maintenance road works have been donor-funded. Against a target of 580 km, approximately 91% had been achieved by December 2006. Selection of roads (usually lasting about 3 days), according to Gitau (2006)[54] was done in consultation with the stakeholders. The aim for the 2004 – 2008 phase of R2000 (with a budget of US$ 100 million) was for every rural population to be within 2 km of access roads.

3.4.4 Achievements

- As at December 2006, the programme had been implemented in 37 districts out of 72
- Development of a national strategic plan and coordination process for Roads 2000 (Goss and Karanja, 2005). Accordingly, the government has developed and documented national systems for operations, training, planning, contracting and reporting.
- Formulation of Road conditions inventory survey system
- Establishment of a proper maintenance system to cater for the road management needs, vehicles and construction equipments

[53] Personal Communication: Goss to Quainoo, 2006. Mr. E. Goss is R2000 Technical Advisor at Kenya Roads Board, Nairobi, seconded from DANIDA & Personal Communication: Karanja to Quainoo (Nairobi, 2006).
[54] Personal Communication: Gitau to Quainoo, 2006. Mr. S. Gitau is the Senior Superintending Engineer at Ministry of Roads and Public Works, Nairobi.

- Establishment of the Road Levy Fund for maintenance, insulated from national treasury so that it cannot be utilised for other budgetary activities. Thus new roads constructed would be given maintenance priority
- Provision made for monitoring and evaluation of training and contract documentation during the pilot phase
- Production of R2000 operations manual, based on results from the trial / pilot projects
- Integrated cross-cutting issues such as 30% women involvement and employment and on life-skills training
- By May 2005, the programme had trained 84 programme participants comprising Road Engineers, overseers in-service and contractors (Kisii Training Centre and Orwa, 2005)

DANIDA evaluation of Roads 2000 funded in the Coast Province from 1999 – 2003, for example, establish the following major findings (Mambo, 2005):

- Increased use of public transport to access markets, schools, health and administrative centres
- Increased freight transport, particularly farm inputs, farm produce and business Supplies
- Variations in modes of transport to access social amenities
- Increased earnings from agricultural and livestock products
- Changes in expenditure patterns on non-essential household goods, indicated by increased housing projects and other investments
- Significant increase in the participation of women in road construction

3.4.5 Lessons learned so far[55]

- Training of contractors should continue, but must be kept busy by awarding them contracts.
- Some contractual rules for small-medium and emerging contractors should be relaxed. In particular, the 10% performance bond should be reduced to about 5%.
- Certificate payment periods must be reduced.
- District Engineers should be authorised to effect payments.
- There is a need for proper, continuous, monitoring and evaluation system. This needs to be institutionalised with emphasis on both technical issues like road improvement methods (quality standards, quantity and riding quality) and socio-economic performance objectives.[56] Impact studies should also be carried out.

3.4.5.1 Strengths of the R2000 programme in relation to sustainability

According to Goss and Karanja (2005), the programme owes its sustainability to the following factors:

- Hybrid usage of equipment (intermediate technology) and employment-intensive solutions.
- Use of existing structures within the Roads Department to implement the programme.
- Sliding scale for government contribution with government slowly taking over the financing from the development partners to ensure financial sustainability. Donor funding was therefore viewed only as an added advantage.
- Institution of a 4% training levy to ensure that capacities and skills are learned

[55] Personal Communication: Gitau to Quainoo, 2006. Mr. S. Gitau is the Senior Superintending Engineer at Ministry of Roads and Public Works, Nairobi.
[56] Personal Communication: Karanja to Quainoo, 2006. Mr. F.D. Karanja is the Chief Superintending Engineer, Ministry of Roads and Public Works, Nairobi, Kenya

- Low cost of the interventions through a network approach with partial rehabilitation (road formation) and spot improvements (gravelling and drainage improvement) instead of a full scale rehabilitation of a few links.
- Continuation of the use of force account system.

3.4.6 Problems and Shortcomings

(i) Nationwide replication, drawing upon the success achieved under the pilot programme from 1991-1993, was seriously behind schedule. Contrary to expectations, only 12 districts out of 69 had been covered by 2000 (Ministry of Roads and Public Works, 2001a). Two main factors account for the slow pace of expansion: inadequate planning and preparation, and lack of government's own funding for the programme (ibid).

Firstly, there was no initial strategic plan to address management and funding issues of the programme. Thus, the delay was in part due to the need to develop an overall road sector strategic plan to oversee management of the entire network and funding to enhance efficiency; this was completed only in 1997.

Secondly, institutional changes responsive to the country's road maintenance demand and overall management was necessary. This led to the establishment of the Kenya Roads Board in the year 2000, when the programme was supposed to have been completed. Functions of this new board comprise, among others, management of the road infrastructure, provision of guidelines on how all stakeholders would be represented in decision making in relation to road maintenance priority setting, and management and control of available funds.

Thirdly, there were delays in releasing donor funding from key supporters for the roll-out of the programme.

(ii) Misallocation of funds meant for road maintenance and spot improvements. In spite of the introduction of the fuel levy in 1993 that guaranteed a reliable source

of funding, funds were directed for other purposes due to political pressure, and not used for maintenance work (Goss and Karanja, 2005).

(iii) Contractors trained in several projects were not used, which is a waste of scarce resources since knowledge gained would be lost because of inactivity. Moreover, this issue de-motivates prospective contractors to enrol for future training since there is no guarantee of engagement or work.

(iv) Though the focus was on new contractors, there was no provision of equipment for the contractors. Another drawback was that the lower end of contractors (though with basic education) was selected for training. Muthua (2006)[57] predicts that the failure rate may be high.

(v) During the initial stages, donor-supported projects within the Roads 2000 programme were generally implemented without sufficient standardisation and coordination. By so doing, training (which is an integral component of every successful employment-intensive programme) was conducted without adherence to any national standards and regulations, chiefly by consultants and Kisii Training Centre alike.[58] That was later corrected through the introduction of the comprehensive Roads 2000 general training plan.

(vi) According to Jennings (2007),[59] SIDA initial contractor development programme failed because it did not involve the government. Internal validation, in terms of quality of technical training received, was successful but lacked business acumen. Despite poor track record in equipment utilisation and management, recommendations from the trial projects in 1993 emphasized the use of force account system and extensive holding of equipment, especially tractors and towed graders by the government for road improvement and maintenance (Ministry of Roads and Public Works, 2001a).

[57] Personal Communication: Muthua to Quainoo, 2006. Mr Muthua is ILO Technical Advisor in Nairobi, Kenya.
[58] Ministry of Roads and Public Works, 2005. General Training Plan, Roads 2000, Republic of Kenya.
[59] Personal Communications: Jennings to Quainoo, 2007. Mr. D. Jennings is IT Transport, Oxford, UK, Programme Director, working in a number of developing countries including Kenya and Ghana.

(vii) The training programme was behind schedule as at end of 2005: only 84 programme participants had been trained against a projection of 4440 by 2010. The delay had been caused by late payment of the training management coordinator as a result of delays in disbursement from National Treasury (Kisii Training Centre and Orwa, 2005).

(viii) As expected from Roads 2000 Eastern Province Project implemented machine-intensively, there was no training and capacity building, and did not follow national standard system. Ironically, implementation was slow resulting in payment delays and their attendant problems. Achievement in improving the road network was minimal.

(ix) Too many and over ambitious objectives in the R2000 plan.

(x) Donor funded projects within R 2000 lacked ownership even at the executive management level within the Roads Department and the parent Ministry. This was evident during the pilot phase whereby the shift from the accustomed force account system to contracting was dubbed *another donor project* instead of a national maintenance strategy.[60] Following reforms such as establishment of the Kenya Roads Board and other significant reforms in the road sector, the programme has now received full ownership and support.

(xi) Despite the good results achieved during the trial period, 1992-1994, R2000 could not take over because of the prevailing political situation. Instead of nationwide replication, corruption became widespread. Taking undue advantage of the outsourcing approach adopted, some engineers established their own businesses whilst working in the Ministry of Roads and Public Works. Consequently, costs went up and quality dropped with some work never completed.[61] By mid 1990s

[60] Kisii Training Centre, and Orwa, H. 2005. Roads 2000 Training Programme. Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd – 7th October 2005. ILO/ASIST, Mombasa, Kenya

[61] Personal Communication: Goss to Quainoo, 2006. Mr. E. Goss is R2000 Technical Advisor at Kenya Roads Board, Nairobi, seconded from DANIDA & Personal Communication: Muthua to Quainoo, 2006. Mr Muthua is ILO Technical Advisor in Nairobi, Kenya.

most donor agencies had withdrawn, therefore the parallel MRP came to a standstill, and eventually discontinued.

(xii) Reporting system – project information, road inventory and assessment plus treatment actions – should be carefully planned to pre-empt interference with other relevant operations and productivity issues. As at December 2006, programme staff were still experiencing difficulty with the reporting system, but hoped to find solutions.

(xiii) Inadequate management of the transition from force account to contracting system: at the close of the Minor Roads Programme, there were no developed labour-based contractors. Contractors first went into machine-based construction with cost per kilometre going up around 300% since no checks and balances[62] were in place, though policy required the use of local resources for labour-based works.

(xiv) Analysis indicated higher labour costs for lower productivity, and therefore no financial incentives to do it by labour under the R2000. Because of "administrative headaches", contractors prefer doing it machine-intensively;[63] a counter-productive move in relation to national poverty reduction objective.

(xv) Cutting corners by some contractors: under the force account system, cheating took the form of ghost workers on the payroll. The only way for contractors to defraud the system was to cut down on quality of work (which is supervision-intensive), or increase task rates and or pay labourers less.[64]

(xvi) Extensive holding of construction equipment, especially tractors and towed graders, by the government for road maintenance is not cost-effective given the past poor maintenance record.

---

[62] Personal Communications: Jennings to Quainoo, 2007. Mr. D. Jennings is IT Transport, Oxford, UK, Programme Director, working in a number of developing countries including Kenya and Ghana.
[63] Ibid.
[64] Ibid.

3.5 Comparative summary of the three Kenya Programmes

- Prior to the introduction of the Fuel Levy Fund all three programmes had been heavily dependent upon, and owe their relative success to, donor money. Withdrawal or suspension of international funding because of maladministration of public expenditure had meant putting the programme on hold until new funding became available. The consequences for maintenance work were devastating. This raises questions about the sustainability of labour-intensive programmes once donor funding is withdrawn. For successful employment-intensive infrastructure programmes, therefore, governments need to commit adequate financial support (with or without international donor funding).

- The KRARP was more successful compared to the MRP. In general, both used force-account system of delivery successfully, though marked as socialism against market-orientated system. Compared with Roads 2000 which used a hybrid of approximately 90% contracting and residual force-account, in the first two programmes, there were no procurement contracts, corruption was minimal if any, no tender board involvement, and direct payment of workers eliminated the delayed payments contractors usually faced. In addition, under both programmes, resident engineers, road overseers and government employees were appropriately trained to construct roads to standard. For example, after construction or rehabilitation, road networks were not compacted but left for six months for natural consolidation under traffic before camber reshaping and gravelling. Administratively, Engineers were in control of work as there was direct communication between Engineers and foremen on site and a good reporting system on task rates and productivity.[65]

- Despite their success stories, it is difficult to quantify the precise contribution towards Kenya's GDP. One major reason for this is because to-date employment-intensive construction has been pushed to the periphery of, and not in the

[65] Personal Communications: Jennings to Quainoo, 2007. Mr. D. Jennings is IT Transport, Oxford, UK, Programme Director, working in a number of developing countries including Kenya and Ghana.

mainstream economy. The fact that unchecked contractors (indirectly supported by some politicians and the private sector) prefer using machine intensive construction attests to resistance still encountered in the field. Thus, depending on the technical feasibility and economic viability, employment-intensive technology should be up-scaled into the mainstream economy as much as possible. In particular, governments should take advantage of the rising poverty and unemployment, population explosion, urbanisation and the need for basic infrastructure services to mainstream employment-intensive approaches. Another reason for the difficulty arises from poor recording and reporting, and poor dissemination of programme information probably due to unsystematic and non-standardised monitoring and evaluation procedures, if any. Thirdly, the inability to realise effective contribution (both directly and indirectly) towards the country's GDP is because no systematic impact study has been carried out to quantify it. One attempt to carry out an impact study was abandoned.

- The cost per kilometre of road for the MRP was higher than KRARP. At 1986 prices, costs per kilometre of road constructed or improved under the KRARP and MRP were KShs 120 000 (or US$ 1 579 at 2005 prices) and KShs 192 000 (or US$ 2 526) respectively.[66] According to Mambo (2005) the width of road and depth of gravel wearing course may account for the variation. In particular, cross-sectional widths adopted for KRARP and MRP were 4.5m and 5.4m respectively in addition to gravel wearing course of 100mm for KRARP and 120mm for the latter.[67]

- Equally, record keeping deteriorated under the MRP. Output was not properly measured, and product was of dubious quality. Cost went up without substantial

[66] Mambo, S (2005) Integrated Labour-based approach for socio-economic development: Impact Monitoring and Evaluation.Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd -7th October 2005. ILO/ASIST, Mombasa, Kenya

[67] According to Mambo (2005) Integrated Labour-based approach for socio-economic development: Impact Monitoring and Evaluation.Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd -7th October 2005. ILO/ASIST, Mombasa, Kenya

improvement of standards because of improper management structures – inadequate supervision and monitoring.

- As at 2004, the percentage of projects at risks constituted 46% which has been gradually reduced to 15% in 2007.[68] In particular, despite reduced cost of transportation, public sector management was largely inefficient: there were slow project start-ups, complex fund flow procedures, and fraudulent and delayed procurement.[69]

3.6 Lessons and Conclusions

(i) The Kenyan Rural Access Roads Programme was immensely successful, and by any standard exemplary in all aspects including planning, organisation, execution, control, and coordination. It therefore constitutes a model for any national employment-intensive infrastructure programme. In particular, reasons for success should be used as a check list to evaluate any proposed programme elsewhere.

(ii) The quality of road network constructed and maintained labour-intensively under the Kenya Rural Access Programme (KRARP) and Minor Roads Programme were by any standard comparable to conventional construction methods. In many cases, they were better than the higher class road system.

(iii) There is no quick fix, short timeframe results for significant poverty reduction, and skill-base development. Considerable development time is required. Given the complexity of employment-intensive infrastructure programmes, lead-in time is needed to sort out institutional, technical, training, organisational, administrative and general management issues prior to seeing physical results on the ground.

(iv) Retired old programme staff members during post-1980s were not replaced. Thus inadequate succession management of programme staff, in part, contributed to

[68] World Bank, 2007b. Country Assistance Strategy Progress Report for the Republic of Kenya for the period FY04-08. Report No. 38055-KE
[69] Ibid. p 6-7

start-up problems after the KRARP. Continuous improvements in planning and training should therefore be accorded a key priority.[70]

(v) Small contractors should be adequately trained and properly monitored in order to be competitive with other contractors. The success rate of small contractors under the MRP over a period of five years was approximately 25%. Frequently, a majority of small contractors submitted unrealistic tenders indicating lack of understanding.

(vi) Policy instruments to ensure a work guarantee for trained contractors to survive and to accumulate requisite experience. Change from the force account system to contracting demands a shared responsibility and economic benefits. Penalty clauses in contracts are insufficient to ensure contractor compliance with labour-intensive construction methods (as in the case of South Africa). What is important is giving incentives to do the work labour-intensively and also for early completion of contract. For example, by introducing bonus incentives to small contractors in Ghana, contracts were completed 70% early in terms of time allocation.[71]

(vii) Without any sustainable source of funding, a life-cycle approach to road maintenance is impossible. The tactics employed were *'plan, hold maintenance, and wait to see if funding will come'*. Thus life-cycle costing approach to road maintenance and rehabilitation, irrespective of road terrain and design life, requires an adequate and reliable source of money for implementation.

The above analysis demonstrates that basic factors leading to the success of the programme included the Kenyan government's policy, political will and commitment to use labour-intensive method of construction to alleviate poverty. As a sign of commitment, the programme was institutionalised in a functional Government Department and not as a stand-alone intervention. In

[70] Personal Communication: Karanja to Quainoo, 2006. Mr. FD Karanja is the Chief Superintending Engineer, Ministry of Roads and Public Works, Nairobi, Kenya

[71] Personal Communications: Jennings to Quainoo, 2007. Mr. D. Jennings is IT Transport, Oxford, UK, Programme Director, working in a number of developing countries including Kenya and Ghana.

addition, good prior preparation resulted in training and capability development necessary for implementing the programme. Furthermore, where sufficient funding was made available to complement the above mentioned fundamental ingredients, the programmes were successful. However, withdrawal of donor funding or insufficient government funding led to programmes subsequent to the Kenyan Rural Access Roads Programme being relatively less successful. Thus, fundamental to every successful anti-poverty employment-intensive infrastructure development programmes are four indispensable factors, namely (i) policy, political will and commitment; (ii) adequate funding; (iii) adequate capacity and (iv) good preparation.

Despite the shortcomings, the Kenyan Rural Access Road Programme still remains a model for how to execute a successful employment-intensive infrastructure programme, taking into account institutional, technical, administrative and managerial requirements on the ground. Thus, Ghana and Botswana experiences of labour-intensive construction were built after the Kenyan model.

CHAPTER 4: CASE STUDY 2: GHANA FEEDER ROADS PROGRAMME

4.1 Background

Ghana, a West Sub-Saharan African country with an area of 238 500 km^2, currently has over 42 623 km[1] of road network of which about 32 600 km are feeder or rural roads network (Department of Feeder Roads, 2003). According to Mathur (1999) roads carry about ninety-eight (98) percent of freight and ninety-seven (97) percent of passenger traffic. Figure 4.1 shows the map of Ghana, consisting of 10 regions and 110 District Assemblies. Annual rainfall is between 890 mm and 2030 (Department of Feeder Roads, 1990). The wettest area in Ghana is the Western Region where the Feeder Roads Programme was first piloted.

Figure 4.1: Map of Ghana showing

[1] CIA (2008), World Fact Book: Ghana. http://www.cia.gov/library/publications/the-world-factbook/print/gh.html Accessed: 04/06/2008

the locations of the towns, Awaso (near Sefwi-Wiawso, Western Region) and Koforidua (Eastern Region) where labour-intensive schools were established.

Years of lack of maintenance due to budgetary constraints until the mid-1980, resulted in rapid deterioration of the good road network Ghana once possessed. Roadways often became impassable until they reached a very poor condition to the extent that serious agricultural losses were incurred because of market-centres inaccessibility. In addition, rural poverty and unemployment, which is comparatively higher than its urban counterpart, became deepened.

To alleviate the situation, the 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. Though the IMF and World Bank hailed the results achieved as a model for structural adjustment in Africa, one drawback was the mass retrenchment and progressive unemployment (La Verle, 1994). Statistics indicated a disproportionately higher level of underemployment[2] and over 50% poverty level prior to the Feeder Roads Programme (Bogetic et al, 2007). Road conditions prior to the feeder roads programme were such that of over 38 000km of network, 46% of the 14 134 kilometres of trunk roads had failed, and the majority of the 22 000 km of feeder roads were *unmotorable* during the wet season.[3] World Bank OED's assessment revealed following road conditions in Table 4.1.

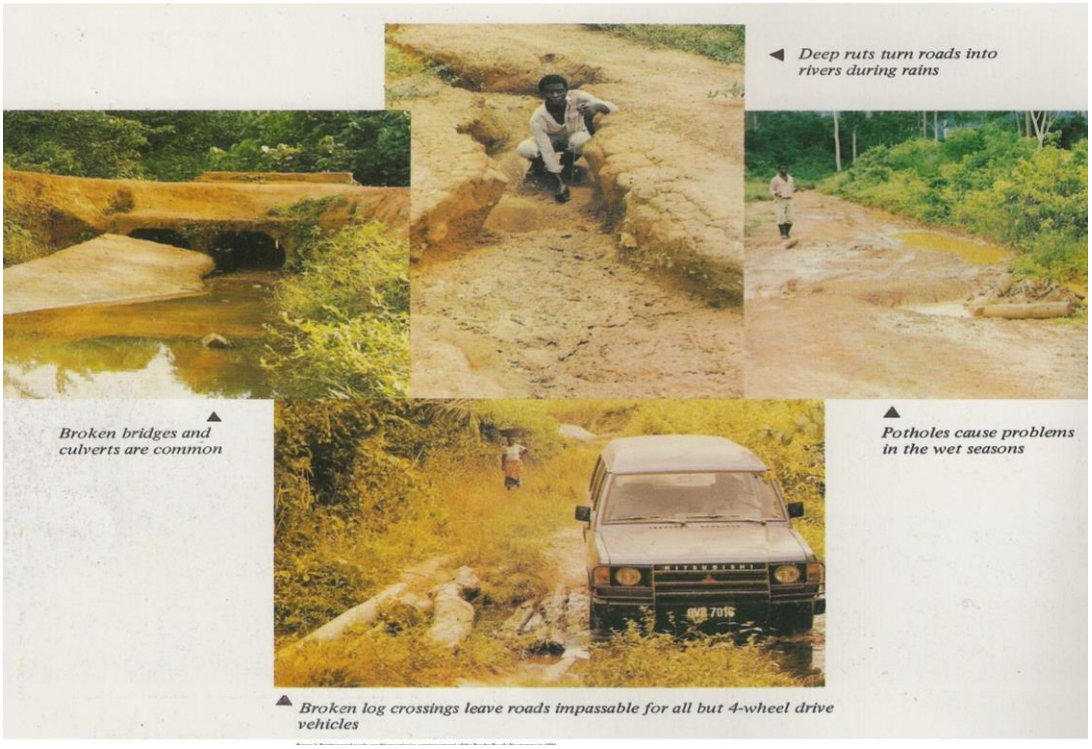
Table 4.1: Trunk and Feeder Roads conditions at 1989

	Trunk Road	**Feeder Road**
Road Condition		
Good	13%	16%
Fair	20%	24%
Poor	67%	61%

Source: World Bank, Operations Evaluation Department, 1999

[2] Ghana Statistical Service (1995). The Third Round Ghana Living Standards Survey September 1991 to September 1992

[3] The World Bank, (1999). Ghana: Building a Stronger Transportation System. World Bank Operations Evaluation Department (OED) Winter 1999 Number 198.



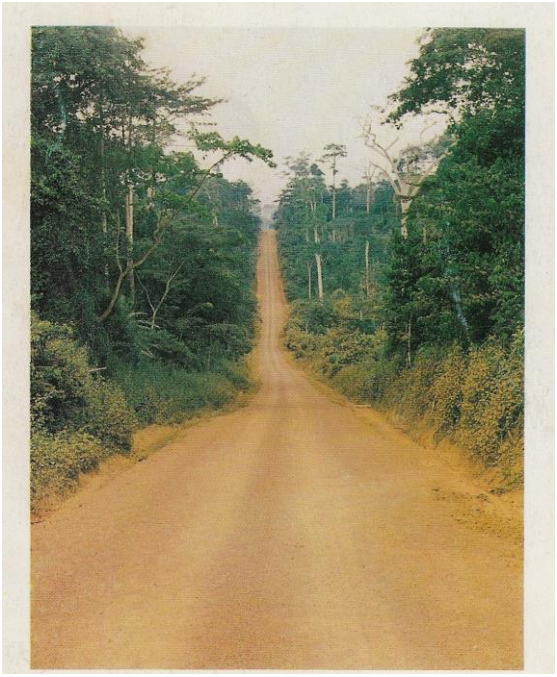


Figure 4.3: A typical finished product of the feeder road after 1986
Source: Bentall and Hlaing, DFR, 1990

Given the widespread unemployment and poverty - with women being disproportionately badly affected – provision of decent, sustainable jobs would have tremendous impact (ILO, 2005). Thus, the plan to provide all-weather access roads labour-intensively to soil-rich farming areas was a well-conceived strategy to increase agricultural productivity and reduce

rural poverty. For effective management of the country's road network, three separate Departments under the Ministry of Roads and Highways (which later became Ministry of Roads and Transport) were created and assigned various responsibilities: Ghana Highway Authority (GHA) responsible for trunk roads; Department of Urban Roads (DUR) managed the city roads in Urban areas; and Department of Feeder Roads (DFR) responsible for the country's rural or feeder roads (Mathur, 1999). Figures 4.2 and 4.3 show the conditions of the road before and after the initiating the Feeder Roads Programme.

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, locked up in the hinterlands, to market centres throughout the country. The country was undergoing recession. Prior to the programme, increased outputs in the agricultural sector had been severely hampered by the inability to cart timber, farm produce and cash-crops like cocoa[4] to market centres on time because of the non-existence of roads linking farming areas and the cities. The existing railway network could not possibly link all remote cocoa growing areas. Consequently, farmers often lost revenue thereby lowering their morale.

Ironically, despite the poverty and unemployment in the rural areas, the Ghana Feeder Roads Programme could not start as a labour-based or employment-orientated programme.[5] The Department of Roads and Highways was charged with the responsibility of just building roads, employment generation was an insignificant portion of it. The obvious implication was the use of capital-intensive methods just to open up rural roads to connect market centres. Maintenance was however neglected, and frequently graders were used to re-level the roads whenever they become impassable due to heavy rainfall. However, propelled by its interest in employment generation, the ILO decided to fund portion of the programme under the proviso that labour-based methods were used.

Contrary to the norm of deploying in-house capacity to deliver road projects, the Roads Department, in conjunction with main stakeholders involved, opted to outsource the maintenance work, giving birth to the Contractor Development Programme under the Feeder

[4] Ghana was the World's leading cocoa producer until late 1990s when neighbouring country, Ivory Coast took over.

[5] Personal Communication: Ampadu to Quainoo, 2002. Dr. S.K. Ampadu is a Senior Lecturer in the Department of Civil Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Roads construction. The immediate advantage, besides providing the road infrastructure network and generating significant employment, was to build the capacity of small contractors. The targeted beneficiaries were locally based, small contractors operating within the rural areas; and the underemployed rural labour force.

4.2 The Ghana Feeder Roads Programme and Contractor development[6]

Institutionalised within the Department of Roads and Highways, the Ghana Feeder Roads Unit decided to maintain and rehabilitate the access roads labour-intensively, having learnt from Kenya's experience. Equally, there was mounting pressure from donor agencies like World Bank and ILO to use small contractors to execute labour-intensive road construction and maintenance work. Unlike Kenya which used the force account system of delivery, Ghana embarked upon a small contractor development approach. The Feeder Roads programme was first piloted at Sefwi-Wiawso in the Western Region, a major cocoa growing and production centre. With annual rainfall of about 2000 mm per annum and only two months dry period, the area represented some of the worst feeder roads in Ghana. The rationale for this strategic choice was that given its adverse climatic conditions, success in this vicinity would imply a high probability of successful replication in any part of the country.[7]

4.2.1 Objectives at conception and implementation

Following the identification of maintenance needs of the Feeder Roads Programme and the high unemployment figures, the programme had three-fold objectives, namely:

(i) road maintenance
(ii) employment creation
(iii) local contractor capacity building

[6] Personal Communication: Danso to Quainoo, 2002. Mr. H. Danso – is the National Coordinator of Ghana Feeder Roads Deaprtment; a Ghanaian Engineer trained at Kisii Training Centre, Kenya in 1991, Labour-based Road Construction.
[7] Personal Communications: Danso, Ashong and Abban to Quainoo, 2002. All three are senior staff members in the Department of Feeder Roads, Ghana.

These objectives were to be achieved by developing contractors who would use labour-intensive methods for the road construction and maintenance.

4.2.2 Scope of work

(i) Pilot project and establishment of a Labour-intensive Training Centre at Sefwi-Wiawso in the Western Region of Ghana
(ii) Training of small contractors
(iii) Rehabilitation, routine and recurrent maintenance of 14000 km of earth roads, as at 1981

4.2.3 Source and structure of programme finance: mechanisms for planning and allocation of resources[8]

Funding for the programme was provided by both home government and donor agencies. The World Bank provided some financial assistance for the road-works and for the purchase of light equipment for 54 contractors. The equipment loan was managed by Bank of Housing and Construction, a local financial institution. UNDP funded the ILO which provided technical assistance on the ground. The Government of Ghana funded a number of projects essentially from consolidated and road funds. Later, other role players who contributed significantly towards the programme were USAID, DANIDA, DFID (2000), the Japanese Government, and the Italian Government. Financial allocations for Regional programmes were centrally controlled from DFR head office in Accra.

For more efficient control of regional fund allocations and effective maintenance management of the feeder roads programme, DFR introduced a Maintenance Performance Budgeting System (MPBS) in 1993 under DANIDA (Bakke, 1996). Depending on traffic volume, fund allocations were directed to where maximum economic returns could be derived in addition to the potential for cost recovery. Ladd (1999) justifies this investment strategy on the grounds that low traffic volumes due to unavailability of rural transport introduce uncertainties with major impact on economic viability of investment and poverty

[8] Ashong, E.N.K. (1996).Labour-based Road Improvement in Ghana: the development and utilization of small-scale contractors; and personal communication to the author in 2002.

alleviation.[9] As at 1998, the system had successfully been implemented in five Regions. According to Bakke (1996), this system enables the definition and establishment of maintenance levels; determination of resource requirements; and establishment of procedures for planning, implementation, control, management and evaluation. The maintenance budget system enabled DFR authorities to identify roads in a maintainable condition in order to allocate budgets according to their maintenance needs (Mathur, 1999). At practical level, the MPBS culminated in the following essentials (Bakke, 1996):

(i) Road inventories, traffic volume counts, condition assessment (such as roughness of road) and road database establishment for over 3000 kilometres of feeder road;
(ii) A planning system and five-year maintenance programme
(iii) Maintenance budgets
(iv) An operating system and maintenance manual.

4.2.4 Institutional Framework and mechanism for programme delivery

The Department of Feeder Roads was established in 1981 under the Ghana Highway Authority (GHA) as a separate agency to cater for the country's rural roads. The purpose was to help cart cocoa beans and gold to established market centres. But lack of inputs because of an economic downturn coupled with the large volume of work rendered it impossible for GHA to cope.[10] In-house capacity problems[11] made the Department lay emphasis on a force account system and capital-intensive methods to carry out its operations. Two major setbacks under this system were the supervision and management problems. Unable to provide the needed logistics for the programme, the World Bank stepped in to help with funding and technical assistance.

Bedevilled by a progressive fall in national productivity and rising cost of production in the 1980s, several African countries (acting on World Bank loan conditions) embarked on structural adjustment programmes culminating in privatisation, massive retrenchments and

[9] Ladd, P. (1999). DFID New Economists Guide: Appraisal of investments in improved access
[10] Personal communication: Abban to Quainoo, 2002. Mr. R. Abban is the Director of Contractor Development Programme, Ghana Feeder Roads Department
[11] As at 1982, Headquarters of Ghana Highway Authority had only 3 full-time professional engineers catering for 5000 labourers

down-sizing (or right-sizing) of the force account labour-force. Thus, with policy and technology changes to use contractors and labour-intensive construction methods respectively, the Department of Feeder Roads had no option but to abolish the force account system. Consequently, many labourers were laid off.

The use of small contractors to improve feeder roads was sequenced in three phases, namely: pilot project with training in the Western Region of Ghana, demonstration in two more regions (Ashanti and Brong-Ahafo Regions) and then nationwide replication.[12] The pilot phase had three broad objectives:[13]

(i) direct transfer of labour-based technology to small-scale contractors for road rehabilitation

(ii) development and introduction of appropriate systems

(iii) development of a planning and management capacity relevant to the peculiarities of labour-based road works

As preparatory work, Ghana Feeder Roads recruited Engineers annually for training at Kisii Training Centre in Kenya. The first batch of Engineers, after University education, had further training at Kisii in 1985. The aim was to generate a pool of Engineers within the Department knowledgeable about labour-intensive construction methods, and able to impart their experience to locals. Modelled upon the Kenya Rural Access Programme, a Labour-intensive Training School was first established in 1990 at Sefwi-Wiawso (in the Western Region) which was later moved to Koforidua in the Eastern Region. The objective was to use Engineers trained in Kenya to train local small contractors.

As regards implementation of the programme, the chosen method of construction was to use equipment and labour simultaneously. End-specification as opposed to method-specification was still favoured by the Feeder Roads Department. The programme was first piloted in the mid- to the late 1980s to identify local institutional, technical and administrative modification to the Kenyan model. By 1992 the programme had trained 110 labour based contractors and they had formed their own Labour-based Contractors Association. Contracts were schedule of

[12] Personal Communication: Ashong to Quainoo, 2002. Mr E.N.K. Ashong is a senior Engineer and Director of Ghana Feeder Roads Programme
[13] Ibid

rates type and one contractor was trained for each of the 110 districts. Loans were secured from the World Bank organised through a local Agricultural Development Bank for a set of equipment purchased for 54 contractors. The loans had repayment criteria that were not advantageous and so very few of the contractors managed to pay the loans back. The programme, managed through the Regional Engineer's office, was going well and Labour-based methods were being used all over the country on feeder roads[14].

During the initial stages of the programme, bidding for Feeder Roads works was exclusively opened to labour-based contractors alone. However, in 1996 the World Bank and some donor agencies insisted that the programme move a step forward to competitive bidding among the contractors and opened the way for non-labour-based contractors to compete for the work that had been initially earmarked for the Labour-based Contractors Association.[15] Analysis of the programme showed that labour-based methods were financially competitive with equipment-based construction methods and, in many instances significant cost savings were recorded without compromising quality to the satisfaction of the Ministry of Roads and Highways.[16]

4.2.4.1 The Training Programme for small contractors[17]

To achieve the objectives highlighted in section 4.2.4 above, a standardised training model was designed, and consisted of classroom and field work in three stages for training both DFR staff and small contractors.[18] These were:

(i) *Twenty weeks training consisting of 6 weeks classroom teaching plus 14 weeks fieldwork on a model road for foremen of both DFR and the Contractors*

(ii) *Rehabilitation of a 5 kilometre road (Trial Site) under DFR supervision*

[14] Personal Communication: Jennings to Quainoo, 2006, 2007. Mr. D. Jennings is IT Transport Programme Director, working in a number of developing countries including Kenya and Ghana , Oxford, UK
[15] Ibid.
[16] Personal Communication: Danso to Quainoo, 2002. Mr. H. Danso is an Engineer and National Coordinator of Labour-based Roads Construction.
[17] Personal communication: Abban to Quainoo, 2002. Mr. R. Abban is the Director of Contractor Development Programme, Ghana Feeder Roads Department
[18] Personal Communication: Ashong to Quainoo, 2002. Mr E.N.K. Ashong is a senior Engineer and Director of Ghana Feeder Roads Programme

(iii) Continued site training and monitoring of each qualified contractor on a full scale contract to rehabilitate 20 kilometres of road per annum

A labour-intensive training school was established at Sefwi-Wiawso in the Western Region, modelled after Kisii Training Centre in Kenya. Choice of site was significant, activated by the high population dense per square kilometre; and the wet climatic condition. It was envisaged to provide a good learning curve for labour-based road builders capable of replicating experiences in dry parts of the country. Setting a threshold entry level of Form 5, the programme was divided into three phases:

- Phase One – Pilot stage: a-two-year duration (1987 – 1989) comprised six (6) weeks of classroom training followed by seventeen (17) weeks of field work instead of the planned fourteen weeks. In the initial stages, seven contractors were trained by Ghana Highways Authority Training division for 23 weeks. During this phase, no specific selection criterion was set for recruitment; and this continued even to the end of Phase One. ILO assisted with the training and the focus was on both technical and management issues. Technical training included labour-intensive construction techniques; plan maintenance; sequence of operations in employment-intensive road construction (which included bush clearing, grubbing, ditching, camber formation, gravelling, culverts and small bridges for drainage) while management issues centred on work programming, site organisation, setting task work, reporting and control, incentive bonus schemes, work measurement, quality control, labour management, costing and estimating, work and labour records (Department of Feeder Roads, 1990). As part of the training programme, participants completed the rehabilitation of a 10 km road using local labour.

Training was successful in producing 21 contractors after three training courses. The main feature realised was the 23 week duration, which was considered too long. However, training was good and relevant as trainers concentrated on mathematics, labour-based technology, technical issues (such as scheduling of work performance, site organisation, setting out of work, quality control, recording and reporting), estimation techniques, resource management and maintenance of plant.

Interested parties were lured by the World Bank light equipment loan package of $150000 which was provided upon successful completion of the course to a selected number of contractors to work on a 5 km road rehabilitation contract. The supply consisted of the following equipment (Ashong, 1998):

- *One 5m^3 Tipper Truck*
- *Three 50KW Tractors*
- *Six 3m^3 Trailers*
- *Two Pedestrian Rollers*
- *One 2000 litres Towed Water Tanker*
- *One Water Pump*
- *One Chainsaw*
- *One set of Hand-tools*
- *One Pick-Up*[19]

To enable contractors pay for the equipment loan administered by Bank of Housing and Construction, contractors were guaranteed work at least over the first four years after securing the loan.

- Phase Two- Demonstration stage: spanned from 1990 to 1993. The Centre had been moved to Koforidua, in the Eastern Region for several reasons. First, Sefwi-Wiawso was too far for most would-be small contractors, but Koforidua was close to Accra, the capital. Second, the new centre has climatic conditions similar to Sefwi-Wiawso. To ease teaching difficulties, reduce the training duration and improve quality of intake, the threshold entry level of GCE Ordinary Level Certificate or City and Guilds certificate was implemented in the selection process for contractor's supervisors (Danso, 1996). Recruits had to be literate and numerate, good at basic mathematics. Apart from technical issues pertaining to road construction, 150 people were trained in management-related issues such as Basic Management principles and Financial Management. Monitoring and evaluation of the training provided was done; and by

[19] Also known as bakkie in South African terms

Phase Two, the programme had become so popular that Government and other donor agencies (for example, UNDP, DANIDA, USAID) were prepared to support it financially. The move was precipitated by huge success achieved and the accompanied jobs generated. Improvements at this stage of the training programme compared with the Phase One encouraged the donors to fund Phase Three.

- Phase Three - Replication: This lasted from 1994 to 1996. By the beginning of this phase, several hundreds of kilometres of access roads had been constructed. So the programme scope changed from rehabilitation only to include maintenance. It was at this stage that World Bank insisted on the introduction of competitive bidding to allow both labour-based contractors and conventional contractors to compete for work originally reserved for the labour-based contractors.

Nationwide replication in the 10 Regions of Ghana called for increased supervisory capacity of the contractor. This was achieved by a combination of integrated methods (Ashong, 1996). First, authorities established that a higher calibre of trainees was recruited through adherence to the minimum entry qualification, and stiff oral and written entry examinations. Second, average class size was reduced to about twenty to enable better trainer-trainee interaction and also identify strengths and weaknesses of each prospective contractor.[20] Third, permanent trainers were developed together with a number of Guest Lecturers who were also DFR staff. To eliminate any suspicion, the guest lecturers or trainers were also trained.

4.2.5 Degree of Participation

Though the programme was developed in conjunction with the private sector and DFR as strategic partners, the approach adopted was top-down: beneficiaries and other stakeholders were excluded from the planning and choice of technology for construction. Trained small contractors were to carry out the road improvement programme. However, even when the programme started, contractors or road builders were not involved in the selection of tools or equipment required for the road works. Authorities single-handedly imported from overseas

[20] Personal communication: Abban to Quainoo, 2002. Mr. R. Abban is the Director of Contractor Development Programme, Ghana Feeder Roads Department

(Asia) and distributed them to the contractors. Poor quality of the imports and resultant influence on daily productivity triggered dissatisfaction from the contractors.

4.2.6 Contract awards, site management and payment system.

The FIDIC form of contract with provision for price adjustment and adaptations for labour-based works was used (Twumasi-Boakye, 1996). Repayment for the US$ 150 000 equipment loan inevitably introduced a negotiated form of tender award which guaranteed continuity of work for the four-year payment duration. Previous attempts to introduce competitive bidding failed because of the formation of cartels. However, upon pressure from World Bank, competitive tendering was finally introduced in 1996 as opposed to the system whereby the Department of Feeder Roads developed schedule of rates and negotiated them with contractors (Twumasi-Boakye, 1996). According to Ashong,[21] contract size ranged between 20 km for road rehabilitation and 70km for routine road maintenance. DFR classified contractors into three groups: (i) Level1 Contractors, fully equipped for rehabilitation contracts; (ii) Level 2 Contractors with a proposed equipment of value £52 000 and responsible for routine/recurrent and periodic maintenance contracts; and (iii) Level 3 Contractors to be given equipment to a value of £28 800. Depending on level of contracting (levels 1, 2 and 3) the recommended number of contractor's supervisors trained was in the ratio of 4:2:1

On a typical employment-intensive construction site, each contractor had a total workforce between 120 to 160; a blend of technical staff with the ability to build roads and manage respective sites, mechanics, artisans, storekeepers, foremen and casual workers led by headmen (Ampadu and Tuffour, 1996). The introduction of the headman served to control any potential malpractices by unscrupulous supervisors in terms of assignment of daily tasks and monthly payrolls. Assigning activities to gangs compared to individual labourers was more appealing to contractors because of daily productivity gains. The organisational structure for each contracting company is as depicted in Figure 4.4. The Managing Director, in the capacity of the Contractor, has under him both permanent staff and casual workers. With exception of the headmen and labourers who are casual, all are permanent staff of the contractor.

[21] Personal Communication: Ashong to Quainoo, 2002. Mr. ENK Ashong is a senior Engineer and Director of Ghana Feeder Roads Programme, Accra, Ghana

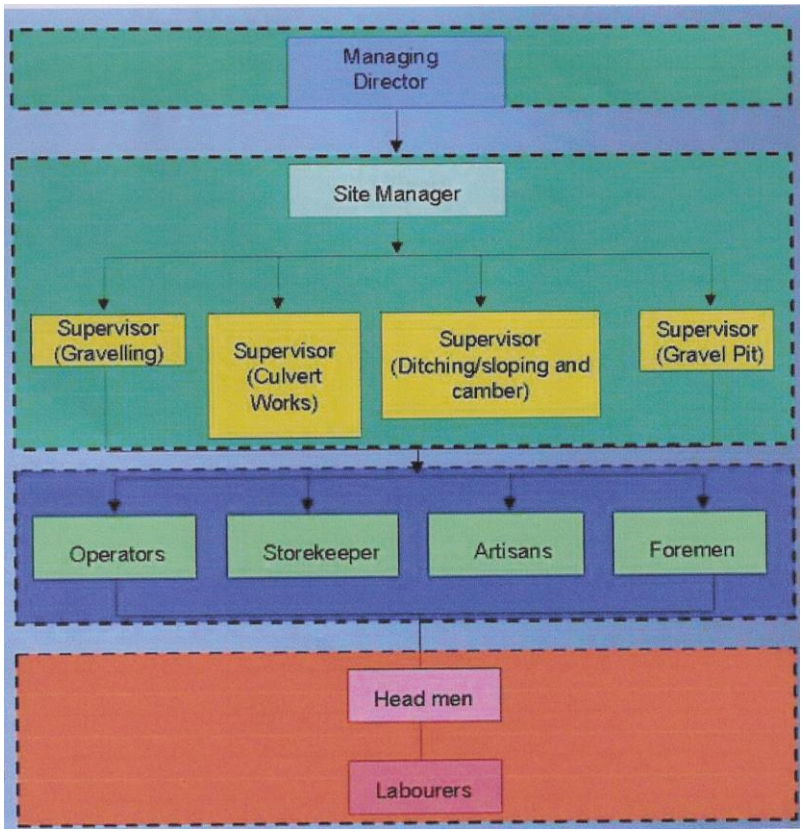


Figure 4.4: A typical employment-intensive site organisational structure of a contractor's company (Source: Ampadu and Tuffour, 1996)

According to Ashong (2002) and Danso (2002), task system of payment was used whereby gangs were remunerated for effective completion of assigned activity. Site operations were scheduled for eight hours per day. Prior to the decentralisation of the programme, completed work was certified by DFR head office (Heggie, 1999). However, when the decentralisation took place, completed work of rehabilitation, periodic maintenance, and minor jobs were certified for payment by the respective Regional Engineers and Regional Planning officers (ibid, p1).

In early 1992, projects were managed at the DFR head office under a National Coordinator who also reported directly to the Deputy Director in charge of Development. However following the decentralisation process, contracts were administered by DFR regional representatives. Under this arrangement, each project was headed by a Project Engineer who reported directly to the Regional Engineer. The aftermath of downsizing of the Department followed by decentralisation did not favour the programme: there was not enough DFR

supervisory staff to carry out work in all the District Assemblies. As a result, management of the contracts was re-centralised at the Head Office in Accra.

4.2.7 Application of Project Management Principles

Programme life cycle management, organisation, procurement, supervision and risk management were unsystematic with lots of disagreements amongst main stakeholders:[22]

- Notwithstanding the agreement reached about outsourcing and use of small contractors, the issue of competitive bidding was forced upon the Department of Feeder Roads in 2000 despite its strong reluctance. Commitment to make the process succeed was therefore not secured from the implementing Department.

- Initially, the contracts were managed from the Engineer's office in the Headquarters, Accra, but confusion soon emerged between decentralisation and centralisation of the programme. The Department had approximately 700 staff (disaggregated into 40 engineers, 560 technicians, accountants, secretaries and administrative staff, and 100 casuals) (Heggie, 1999). In spite of the resistance, Department of Feeder Roads (DFR) was pushed to decentralise and manage the programme through 110 District Authorities. However, unexpected consequences of the structural adjustment programme later played in the favour of DFR. The Department was forced to embark on the biggest retrenchment ever, with roads supervision suffering serious casualties. This led to the inevitable re-centralisation of contract management at the Department's Office in Accra.

- The management of DFR also changed during this period with the change of government; the programme lost both vision and direction. Certain individuals in DFR tried to keep the Labour-based programme going but without

[22] Personal Communication: Jennings to Quainoo, 2006, 2007. Mr. Dave Jennings is Programme Director at IT Transport, Oxford, UK

commitment of the Director this proved impossible.

- In spite of this unfavourable environment, a few successful small scale contractors were developed but could not expand their numbers of trained supervisory staff to do more work by Labour-based methods, so changed over to become equipment based contractors because it was much easier to supervise and manage.

- The Labour-based Contractors Association was left with only the poor small contractors who could not afford to "chase" their payment certificates in Accra and the association was soon absorbed into the mainstream association and no longer exists.

- The successful contractors left Labour-based (L-b) methods and became equipment-based, these were supported by the Regional engineers who no longer had foremen and inspectors to supervise the L-b contract sites.

4.2.7.1 Identified risks and management

Risk identification and management was either sketchy or non-existent as there was no risk management plan. For instance no contingency plan was made for contractors' desire to become conventional. Equally no provision was made in case of delayed payments to contractors. These adversely affected both the contractors and the programme itself.

4.3 Achievements and Impact

4.3.1 Achievements

At the end of the pilot programme in Phases One and Two (from 1986 to 1995), the following had been achieved (Ashong, 1996):

Table 4.2: Feeder Roads Programme achievements, from 1987 to 1995

PROJECT DATA	1987 to 1989	1987 to 1995
● Length of roads rehabilitated, km	150	> 1 400
● Number of culverts constructed	214	3 711
● Average cost of rehabilitation (US$ per km)	9 000	10 000
● Average workforce per contractor on standard contract	160	150
● Average man-day input (man-days/km)	2 650	2, 500
● Employment created (man-days)	397 000	4 400000
● Average daily wage (US$)	1	1
● Total Wages paid to labour (US$)	368 000	4 400 000
● Total number trained:	**199**	**615**
- Contractors	21	93
- Supervisors	103	380
- Mechanics	15	
- DFR Engineers	29	64
- DFR Foremen	31	78

Source: Ashong, 1996

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 work highlighted above.

Each of the 54 Contractors equipped for rehabilitation works was supplied with a set of equipment to the value of $150 000 re-payable over a period of four years, via monthly instalments deducted at source from Contractor's claims.

Tangible achievements made may be summarised as follows:

- Trained personnel[23] = 639 (as at 1998)
  - Number of small contractors = 93
  - Number of Contractors' personnel (supervisors /foremen) = 380
  - Number of DFR Foremen = 102
  - Number of DFR Engineers =64
- Employment created as at 1996 = 4.4 million mandays (34 000 jobs)[24]
- Kilometres of roads maintained as at 1997 = 10 000 at an average cost of $4 885 per kilometre of maintenance and rehabilitation work [25]
- Foreign exchange savings in terms of equipment procurement
- Creating of employment opportunities for both men and women, thus boosting the rural economy
- Development of a core of skilled labourers for future routine maintenance
- Involving communities in their own development
- Labour-based methods classified and won acceptance of the Ministry of Transport.
- Formation of Association for Labour-based contractors

Analysis indicated that labour-based methods created approximately 15 times more jobs per kilometre than conventional methods executing similar works; and wages accounted for about 40% of total project costs (Stock, 1996). A comparison of employment-intensive methods with machine-intensive approach for delivering similar works carried out by

[23] Ashong, ENK (1998) Labour-based Road Improvement in Ghana: Developments and the Way Forward. A proposal presented to DFID

[24] Oduro-Kwarteng (Supervisor, Dr. S.K. Ampadu at UST, Ghana) BSc (Hons) The Potential for Employment Creation in the Construction Industry in Ghana. Research Report Submitted in partial fulfillment for the BSc (Eng). Degree. University of Science and Technology, Kumasi. Ghana. Also Personal Communication to Mr. ENK Ashong in 2002, Accra Ghana.

[25] Cost per kilometre improved from $10 000 (1987-1995) through $5558 (1996) to $1817 (1997). This is an indication of effective use of the productivity curve

Tajgman and de Veen (1998) indicated that the former created 320% more employment, and were in all aspects comparable in relation to quality standards. In financial terms, employment-intensive methods were on the average cheaper per kilometre compared with conventional machine-intensive methods; even on earthworks, feeder roads employment-intensive construction methods were 30% lower (Taylor, 1998).

Starting with a total feeder road network of 22 000 km in 1986, the figure increased to 32 600 km in 2003 (Ghana Feeder Roads, 2003), then 41039 km of feeder road in 2005[26] which represents a remarkable achievement. Furthermore, over a period of fifteen years, Ghana has been able to reduce poverty levels from over 50% to less than 30%, (Bogetic, Bussolo, et al, 2007) an achievement hailed by the World Bank as a relatively good record of poverty reduction (Coulombe and McKay, 2003).

A study by Hine and Riverson (2001) to investigate the impact of the feeder roads programme on poverty alleviation in farming areas concluded that "improved road surfaces (to reduce road roughness) of short lengths of roads and tracks would have negligible effect on the prices paid to the farmer. However, replacing a 5 km footpath between a village and the road by a motorable vehicle track may benefit the farmer through increased farm gate prices by over 100%.

4.4 Problems and Shortcomings

Despite the successful attempt in labour-based contractor development, programme environment (both internal and external) and management-related problems subdued the programme as highlighted in the foregoing discussion. These problems hold valuable lessons for future contractor development programmes anywhere.

(i) Non-involvement of contractors in planning and choice of equipment: Equipment selection did not involve beneficiaries of the road programme. End specification was interpreted as business as usual to acquire the final product, the access road. Where labour-based methods were used, quality of hand tools

[26] Government of Ghana, National Development Planning Commission (2006). Implementation of the Ghana Poverty Reduction Strategy: 2005 Annual Progress Report.

imported from China and Taiwan was poor. Currently contractors are involved in the selection of equipment.

(ii) Unfavourable loan repayment criteria and difficulty were faced by most contractors: According to Ashong (1998) in a proposal to DFID, local Banks were charged with the responsibility of managing the $150 000 equipment loan granted to the contractors. In addition to assessing the contractor's credit worthiness, the banks were required to perform the following duties:

- Monitoring, evaluation and offering of advice on field performance of equipment
- Monthly reporting on the repayment status of each contractor
- Provision of performance and advance mobilisation guarantees upon request by a contractor
- Advise DFR on financial matters such as re-investment of recouped loans

Undoubtedly, ability to repay depends on availability and award of contracts. In addition, the contractor should be able to make meaningful profit without compromising quality of work. With poor bidding capacity of most contractors, no wonder some defaulted in loan repayment. The contractor's situation worsened as interest rates escalated from 20% in 1988 to 35% in 1996 (Danso, 1996) and contractors ended up paying more.[27] This was because of the devaluation of the Cedi in relation to the dollar and repayment of the loans in dollars.

(iii) Introduction of competitive bidding by donor agencies for labour-based road contracts between small-scale labour-based contractors and equipment-based contractors: World Bank standard tender document process with preference for domestic bidders was used. Competitive bidding with small-scale, equipment-based contractors was introduced which resulted in the formation of cartels.

[27] Personal communication: Abban to Quainoo, 2002. Mr. R. Abban is the Director of Contractor Development Programme, Ghana Feeder Roads Department

Moreover, the tender adjudication process was biased in favour of conventional contractors: cost mark-up of 10% was added to quantities from equipment-based contractors. Lack of consensus on the bidding process and non-commitment by DFR, the implementing agency, could only engineer a serious backlash for the programme. There was reluctance to compete with equipment-based contractors.

(iv) Against its interest, DFR decentralised the programme in 2000 and managed contracts from Regional Engineer's office through the 110 District Assemblies which acted more or less like political organisations with vested interests. The structural Adjustment Programme (orchestrated by IMF, International Monetary Fund and the World Bank) was a mixed blessing for DFR. One setback of the structural adjustment was the disproportionate reduction of road supervisors notwithstanding the fact that labour-intensive road construction and maintenance is management intensive. Secondly, DFR was required to transfer technical responsibility of the programme to district departments. However, the Ministry of Local Government maintained control of district government administration and funding, thereby recentralising the programme (World Bank, 1999). Nonetheless, due to the Department's strong position of centralisation of contract management, payments at the DFR office in Accra was restored.

(v) Change of DFR management initiated by the change of government resulted in loss of vision for the programme and lack of commitment from the programme Director. Various attempts by certain DFR individuals to keep the programme going proved unsuccessful.

(vi) Once successful, the remaining few small scale contractors chose to become equipment based contractors. Reasons range from desire to diversify and tender for big contracts, inability to expand number of supervisors trained to match labour-based work on the ground, to difficulties inherent in supervision and management of labour-based contracts (Taylor, 1996). These were supported by the Regional engineers who no longer had foremen and inspectors to supervise the Labour-based contract sites. According to

Bradbury (2002)[28] only 10% of contractors trained were labour-based in 2002, though the Department's decision was to continue training despite the tendency to abandon labour-based methods in favour of machinery. This was a bit of a quandary. The popular opinion was that big contractors should look after the management issues (such as logistics and support, procurements, technical, programming of the work) on behalf of the small contractor. The labour-based foreman or the small contractor should then concentrate on the actual field work of supervision and measurement since it is output that is needed.

(vii) Contract time overruns or late completion of work by contractors, non-adherence to specifications and late payment of certificates: In certain circumstances, projects or contracts were over nine months delayed despite greater presence of conventional contractors. In effect, many contracts were cancelled.[29] Under the DFID-sponsored component of the Feeder Roads Programme, a bonus for early completion of the contract was introduced as part of the contract document (which proved successful).

Late payments were prevalent and a major disincentive for labour-based contractors (Stiedl and Tajgman, 2003). The late payment had two major effects. First, contractors were not able to pay employees on time,[30] which is a certain recipe for labour disputes, translating into strikes (Stock, 1996), delays and cost-overruns. Second, inability to payback equipment-loans to the Banks jeopardised the Contractors credit ratings. Besides, failure to make timely equipment-loan repayments to the Bank implied paying additional costs due to Bank's financial charges. The gravity of the government's inability to effect prompt payment for certified work due to financial constraints made it difficult to complete road projects on time. At the end of the year 2000, total unpaid

[28] Personal communication: Bradbury to Quainoo, 2002. Mr. T. Bradbury is DFID representative in Ghana in 2002 in charge of an aspect of the small contractor training programme.
[29] Personal Communication: Danso to Quainoo, 2002. Mr. H. Danso is an Engineer and National Coordinator of Labour-based Roads Construction, Accra; Deelen L and Osei-Bonsu, K (2002) Equipment Finance for small contractors inn Public Works Programmes. Working Paper No.28. ILO Geneva.
[30] Asiedu, PK (1996) (Supervisor, Dr. S.K. Ampadu at UST, Ghana). The State of Labour-based Technology for Road Construction in Ghana. Research Report Submitted in partial fulfillment for the BSc (Eng). Degree. University of Science and Technology, Kumasi. Ghana.

work was approximately US$ 33 million and special provision had to be made in the 2001 budget to address the problem (Ministry of Roads and Highways, Ghana, 2001).

(viii) Internally, DFR had serious management problems: difficulties in retention of staff, coupled with cash-flow problems. As at 1997, DFR was operating at its lowest level since inception because of financial constraints; and therefore seeking funding from donors (Ashong, 1998). Lack of funds has made it difficult for the trained contractors to secure contracts from DFR. Thus, the ultimate submergence of the pool of trained small contractors with the flow of time due to lack of continuity of work, late government payment and inadequate contract management was inevitable (Taylor, 1996).

(ix) Reduction in quality and output of work partially due to a combination of three main factors (Ashong, 1996). First, delayed DFR payment coupled with lack of financial management know-how resulted in serious cash-flow problems for the contractors. The latter were unable to pay workers according to scheduled. Consequently, several foremen resigned thus creating a huge vacuum. Second, DFR capacity problems in the face of wide geographical spread of increased number of trained contractors culminated in less site visits, supervision and monitoring of work. The third contributory factor was underperformance of contractors' light equipment due to frequent break-down and lack of training for contractors' mechanics and operators.

(x) Unsystematic recording of planning and performance: In a review of the Roads sub-Sector Development Programme, DFR (2003) highlighted both the lack of reliable road inventory data and effective planning. Equally, in a joint-evaluation of the Road sub-sector programme in Ghana undertaken by The Netherlands Economic Institute (Rotterdam) in 2000, DANIDA noted that the lack of systematic documentation of relevant project data made impact assessment difficult to ascertain (DANIDA, 2000). This is symptomatic of inadequate programme planning. Early incorporation of evaluation and performance indicators in the programme would have enabled implementers to

record relevant information required for evaluation. In particular, performance measurement should be based on certain key principles (De Vries, 2001). Data recorded should be (a) result-oriented (focus primarily on outcomes and outputs), (b) selective (concentrate on significant indicators), (c) reliable (data must be accurate and consistent over time), (d) relevant (information from data should be valuable to both policy and decision-makers) and (e) accessible.

(xi) Table 4.3 indicates some inconsistencies in maintaining road conditions. For example, the percentage of poor feeder road network jumped from forty-seven (47) percent in 1995 to sixty-four (64) percent in 1997, contrary to an expected improvement. Inadequate funding hampered work progress: delay in payments for certified work completed, and similar phenomenon in relation to award of contracts at the District Assemblies. Ultimately, road maintenance activities were scaled down leading to further deterioration.[31] The further deterioration amounts to disinvestment.

Table 4.3: Feeder Roads riding quality over time

	1989*	**1991•**	**1995•**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Road Condition	%	%	%	%	%	%	%	%		
Good	16	16	23	21	28	27	28	29	32	36
Fair	24	24	30	15	18	23	22	13	19	26
Poor	61	60	47	64	54	50	50	58	49	38

Sources: *World Bank OED, 1999
•DFID**,** 1997, http://www.odi.org.uk/tropics/projects/2288.htm cited on 06/11/2002
Figures for 1997 to 2003 sourced from Department of Feeder Roads

(xii) As at 2007 DANIDA was trying to revive the Labour-based contracting system and decentralise to the districts but not without resistance from Department of Feeder Roads.

[31] Ministry of Roads and Highways, Ghana (2001). Impact of Road Infrastructure on Ghana's Poverty Reduction Strategy: 2001 Review Report for the Road Sub-Sector Development Programme.

4.5 Lessons and Conclusions

Drawing on the Ghana's success story of labour-based infrastructure delivery through contractor development, the following lessons can be advanced to help implement similar programmes elsewhere.

(i) The Feeder Roads Programme has demonstrated the technical feasibility, financial viability and appropriateness of using employment-intensive methods for infrastructure provision without compromising quality of product.

(ii) Successful development of labour-based small contractors hinges on effective and relevant training received (not just life-skills), provision of necessary resources and continuity of work. The government's crucial responsibility is to strengthen its contract management capacity.

(iii) Selection of contractors and their permanent staff (supervisors, mechanics, artisans and storekeepers) should be based on threshold entry level of numeracy and literacy where appropriate. This will improve training efficiency and effectiveness.

(iv) Late payments of certified work pose a significant risk to the success of employment-intensive contractors. Thus, to eliminate cash-flow problems and unrest at construction sites, and improve contractor's ability to attract further funding from financial institutions, timely payment is crucial.

(v) Decentralisation is good to promote active participation of local communities in developing a practical feeder road maintenance system (World Bank, 1999) and in addition to fostering ownership and responsibility for maintenance needs. However, the execution was premature because of inadequate consideration given to capacity issues and resource (human capital and funding) needs at the District assemblies for efficient maintenance of the roads (ILO, 2005). As summarised by the World Bank, the decentralisation process was tainted by *(a) weak organisational capacity at the district level and*

reluctance to devolve accountability to local constituents; and (b) political interference at the district level.

(vi) To improve performance: (i) involve contractors in selection of equipment (ii) timely payment to labour-based contractors for work accomplished, (iii) local production of tools (if quality can be ensured).

(vii) However, as noted by Ashong (1996), high premium should be placed on training and supervision. In monitoring trained personnel, appropriate feedback mechanisms should be instituted for timely response to the day-to-day technical and management needs of already trained foremen and supervisors in the field.

(viii) Given that small contractors find it difficult to secure bank loans for their work, governments should consider provision of light equipment on a lease basis.

(ix) Evaluation should form an integral component of every employment-intensive infrastructure programme. In addition, recording and reporting systems should be strengthened in order to ease difficulties associated with programme evaluation.

(x) For continuity of programmes and effectiveness of poverty alleviation, developing countries should endeavour to raise their own funds and move away from over-dependence on foreign aid.

Similar to the Kenyan Rural Roads Programme, the Ghana contractor development programme was initially successful due to a number of integrated factors. These include a Ghana government's policy decision to use labour-intensive methods for its feeder roads programme. Funding from various donors spearheaded by the World Bank enabled good preparation together with relevant training to take place. The programme was institutionalised within an existing Roads Department. Nonetheless, lack of commitment expressed by late payment of contractors and inadequate preparation for decentralisation of the programme (after almost one-and-a-half decades of success) was a serious setback. The programme was

dealt a further blow when dwindling funding ushered in a period of severe cash flow problems. Many small contractors were therefore indirectly forced out of the programme.

Notwithstanding the difficulties and shortcomings the Ghana contractor development programme for executing labour-intensive construction works became a model and reference point for other sub-Saharan countries.

CHAPTER 5: CASE STUDY 3: BOTSWANA LABOUR-INTENSIVE ROAD IMPROVEMENT AND MAINTENANCE PROGRAMMES

5.1 Context

Botswana is a landlocked, sparsely populated and drought-prone Southern African country stretching over 582 000 square kilometres. In the 1970s, unemployment and poverty were high amongst the country's small population of approximately one million with about eighty (80) percent living in rural areas. Accessibility to social amenities and other facilities was necessary to improve standard of living. Thus, integrated rural development and contingency relief development programmes have been central to the Government of Botswana's national development plans.

One productive means to improve the rural economy was development of the communication network throughout the country, of which rural road construction and accessibility formed an integral component. As a developing country in the 1970s, the GDP per capita was low with a high incidence of poverty. Shared rural economic growth that includes productive employment creation via physical infrastructure development was therefore a viable option to combat poverty. Another problem contributing to high unemployment levels was the lack of employable skills amongst the youth population. Propelled by outcomes of the rural economic initiatives and largely by the discovery of diamond since 1980s, Botswana has experienced remarkably consistent high economic growth rates (World Bank, 1993). Consequently, the country moved from low income to middle income bracket. Ironically, unemployment and poverty remain comparatively high (United Nations, 2002; Islam et al, 2005)(see Figure 5.2). Arguably, despite the categorisation as middle income and one of the world's highest growth economies (World Bank, 2004d; IMF, 2007), employment-intensive construction methods still make socio-economic sense, though authorities lack commitment to the technology.

Out of the then 21 000 km of gazetted and non-gazetted road network, the latter constituted about sixty-two (62) percent with responsibility placed upon District Councils[1] to upgrade and maintain them. The challenge was to develop the requisite capacity for the Councils to discharge their duties. Administratively, the country was divided into three regions comprising nine districts with major cities and towns as depicted by Figure 5.1.

[1] District Councils were institutionalised following Government of Botswana's decentralisation policy.

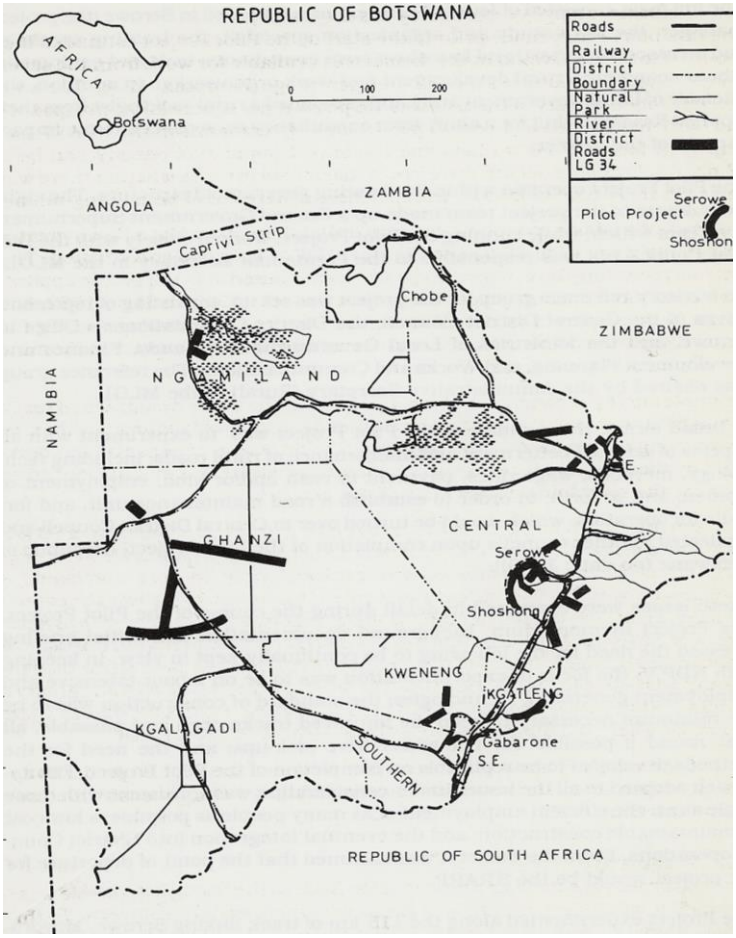


Figure 5.1: Botswana: Local Government, LG34 district Roads

Source: Republic of Botswana, in McCutcheon, 1991a

As a precursor to the first employment-intensive road programme in the country, the Government of Botswana established an embryonic rural roads unit under the auspices of the Ministry of Works and Communication in 1974 to investigate the feasibility of using employment-intensive methods in rehabilitation and maintenance of the country's rural road network (McCutcheon, 1992). The pilot initiative failed to pass the feasibility test in terms of quality standards and efficiency of product leading to rejection of the technology. Analysis indicated serious issues leading to its failure (McCutcheon, 1991b): lack of lead-in time for training, a basic ingredient of a successful employment-intensive infrastructure programme; and the capital-intensive nature of the experimental set-up. Two years later, the government embarked upon a second attempt to experiment with employment-intensive technology.

Since the 1970s, two main employment-intensive programmes have been implemented, namely LG 34 and LG117.[2] The first was highly successfully, which was employing over 3 200 casual labourers at its peak; while the second, an amalgamation of LG 34 and LG 38, produced mixed results largely due to the hybridisation.[3] Current programme, LG1107 is of a relief nature which scarcely leads to development. Nevertheless, both programmes have policy connotations for implementation of successful employment-intensive programmes.

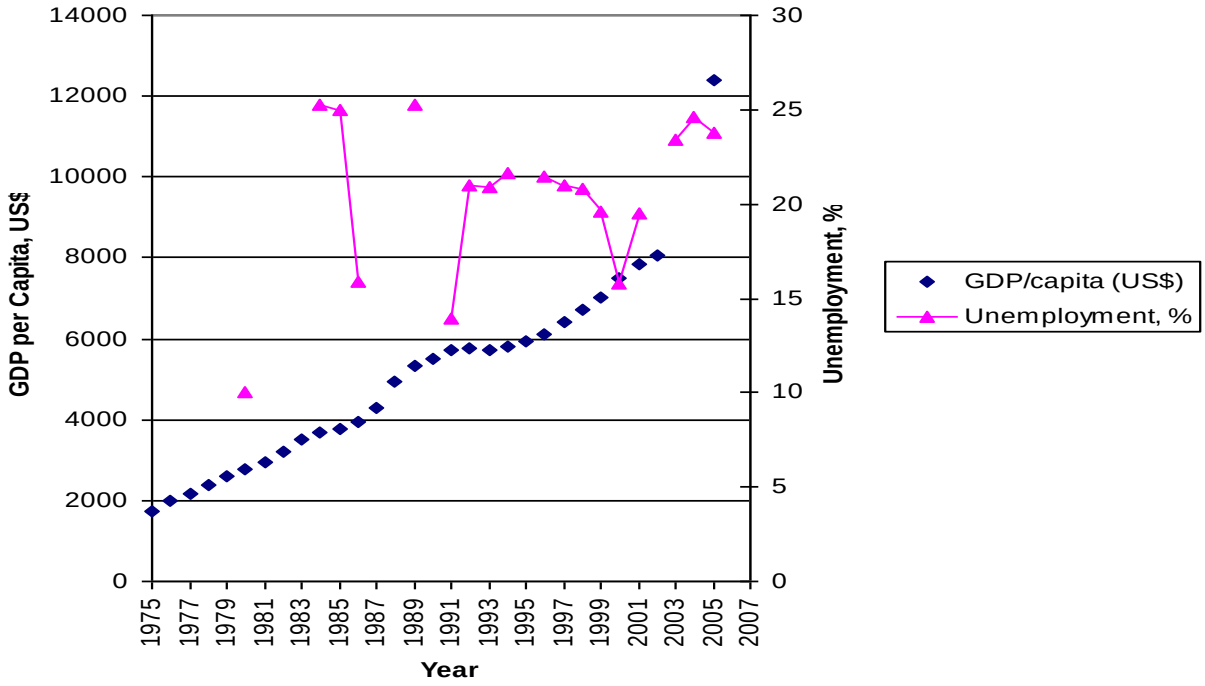


Figure 5.2: Botswana: Economic growth versus unemployment
Sources: Adapted from IMF, 2003; BIDPA 2006; African Development Bank, 2000; Siphambe, 2007

[2] LG117 was an amalgamation of LG34 and LG38 (labour-intensive road programme and a relief project)
[3] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

5.2 District Roads Labour-intensive Improvement and Maintenance Programmes, LG34 (1980 – 1985)

Poor road conditions constituted a major obstacle to rural economic development. Therefore following Botswana's fifth National Development Plan (1976 – 1981) and taking advantage of the World Bank's Third Road Project in Botswana, the government commissioned research to investigate the best road maintenance practices suitable for the country's ailing road network (Republic of Botswana, 1977). The World Bank provided the requisite technical and financial assistance. A pilot project was started in the Central District in 1980[4], and replication in other areas depended on evaluation results relating to its technical, economic and administrative implications.[5] Projected estimated cost for the programme was P 2.449 million.[6] District Councils were charged with the responsibility of upgrading and maintaining Botswana's non-gazetted rural roads, the only communication network linking communities and agricultural centres. Results of the pilot project indicated the technical feasibility and economic efficiency of labour-intensive construction methods. From inception through the merger with LG38 under LG117, the programme constructed over 1820 km of quality maintainable road and employed over 7000 casual labourers.[7]

Major conclusions (of far-reaching implications) drawn from the lead-in pilot project were documented by ILO evaluation mission team (Watkins et al 1986), and may be paraphrased as follows:

- at the same standard of construction, labour-intensive construction methods were comparatively cheaper than conventional construction techniques;

- labour availability was sufficient, notwithstanding the low remuneration compared with prevailing market prices;

[4] The pilot Project under LG34 had the objective of upgrading and maintaining a 115 km network linking Serowe and Shoshong in the Central District.
[5] Republic of Botswana, 1977. National Development Plan 1976 – 1981. Ministry of Local Finance and Development Planning, Gaborone.
[6] Ibid, p326. Total capital cost constituted approximately 32.7%. Actual cost amounted to P 2.8 million , reported by ILO technical evaluation mission team in 1986.
[7] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

- site organisational structure, most suitable for the programme, was task groups under supervision of group leaders who reported directly to an assigned supervisor

- labour-intensive construction methods, together with the organisational structure developed, were commendable for nationwide replication.

Recognising the employment generation potential in addition to the physical asset creation, the Government of Botswana made a decision to expand the programme into all the nine districts using employment-intensive methods of construction. Planned initially for a duration of five years, it was later merged with LG38 in 1992 under the LG117 programme until 1995. Thus, in principle, the labour-intensive construction programme lasted almost one and half decades. Institutionalised within the Ministry of Local Government and Lands, with Ministry of Works and Communication as immediate stakeholder, other major stakeholders were the World Bank which funded the pilot project, the ILO technical assistance team, and NORAD which performed World Bank's role as financier during the expansion phase.[8] The succeeding sections of this subchapter will describe and discuss the five year expansion programme of the LG34 and its amalgamation under LG117.

5.2.1 Objectives at conception and implementation, and scope of work

In addition to other objectives, the overarching technical objective was "to let labour intensive road units keep the 13000 km ungazetted District roads open and passable, if possible all year round, by 2-wheel drive vehicles" (Watkins et al, 1986; McCutcheon, 1992; Muatjetjeja, 2006). Other objectives were crafted for LG34, namely:

(i) Creation of employment-intensive Road Units in all the Districts for route improvement and maintenance;

[8] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

(ii) Low-cost spot improvement and selected betterment;

(iii) Use of labour-intensive method of construction for the programme;

(iv) A two-year pilot project to examine the feasibility and efficiency of the chosen method of construction; associated socio-economic benefits and expansion possibilities into all other Districts.

Prompted by political pressure and acceptability, the standard of road construction was raised from 4.5m to 5.5m width of carriageway at early stages of the LG34 programme (ibid).

5.2.2 Source and structure of programme finance: mechanisms for planning and allocation of resources

LG34 received both foreign and local funding, the former being disproportionately higher. The total projected cost approved by National Development Plan V was
P 4.37 million (Egner,1986). The World Bank funded both the pilot project and the ILO technical assistance team. NORAD funded both the expanded programme and ILO technical assistance team. By 1985, NORAD had contributed P1.7 million and a further commitment of P2 million for the National Development Plan VI and World Bank loans accounted for P1.24 million (Egner, 1986). SIDA also contributed significantly towards the five year planning with budget allocations under the auspices of the DRE assisted directly by TOs (McCutcheon, 1991a).

5.2.3 Institutional Framework and mechanism for programme delivery

Figure 5.3 shows the organisational structure for work implementation, hierarchical linkages and nature of training courses required at the District Council Road Units.

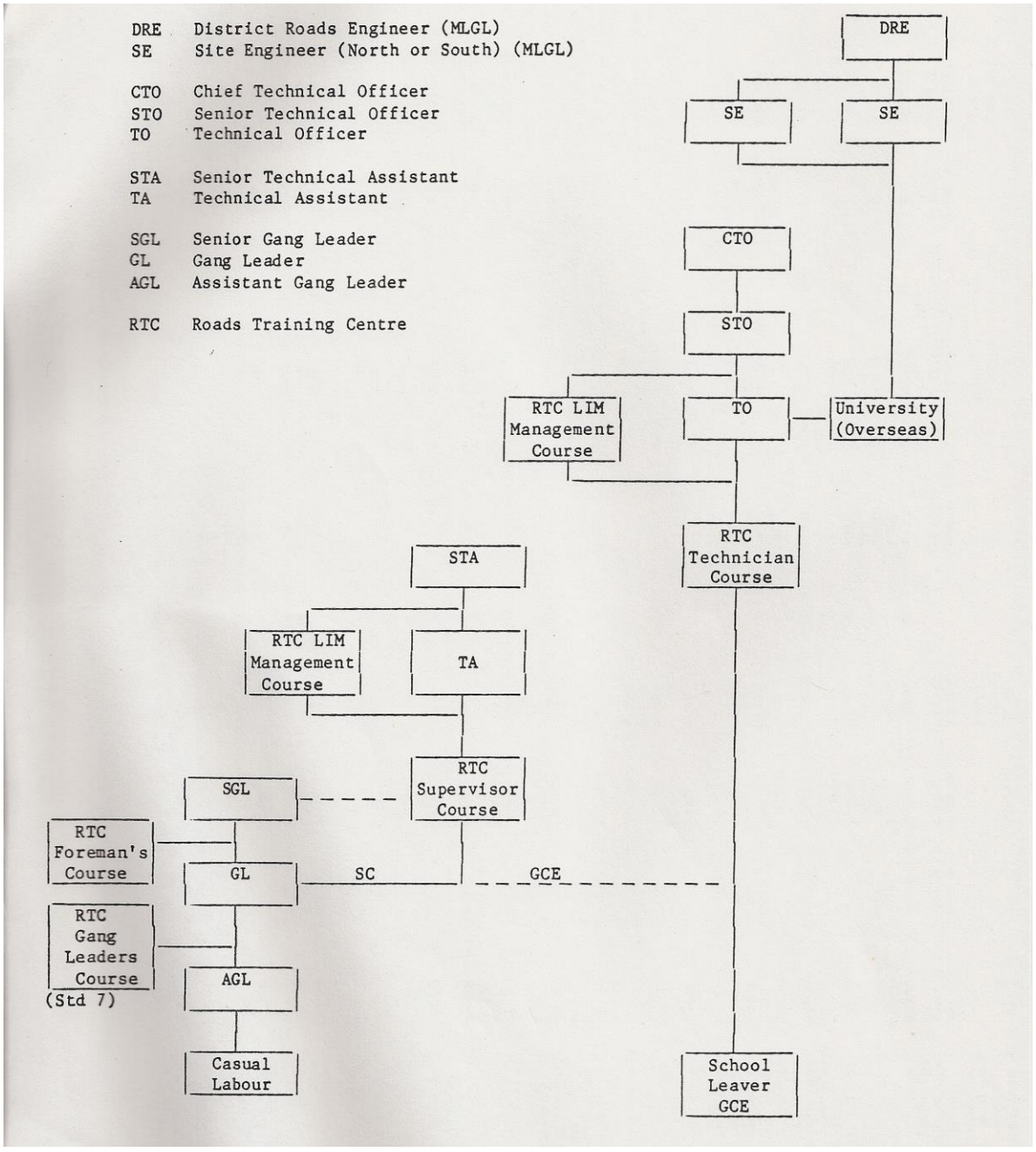


Figure 5.3: LG34 Programme implementation organisational hierarchy & human capital requirements.

Source: Watkins et al, 1986

Institutionalised within the Ministry of Local Government and Lands (MLGL), supported by Ministry of Works and Communications (MWC), adequate preparation was embarked upon: appropriate organisational set-up was made for overall programme planning and management, training, site organisation, close supervision of work performance, and payment mechanisms. In particular, the MLGL was responsible for LG34 planning and design, training and implementation, largely accomplished with the assistance of World Bank and ILO. Specifically, within the said ministry, DRE, assisted by CTOs, STOs and TAs, prepared the five year rolling plan for LG34, including finalising potential routes for construction. Training fell under the auspices of Ministry of Works and Communication at their Road Training Centre, but was conducted directly by ILO which developed the manuals (Muatjetjeja, 2006).

Technical Assistants, TAs, were charged with the additional responsibility of conducting meaningful community participation and prefeasibility studies with communities within the District Councils. Terms of reference included explanation of the method of construction and its nature, quality of product expected, maintenance of infrastructure constructed, conditions of employment and manpower selection criteria (Ibid). However, cost recovery was not discussed.

Actual implementation of LG34 programme was effected through the establishment of District Council Road Units (DCRUs), and well-organised command structures ranging from gang-leaders through technical officers to chief technical officers. Furthermore, each DCRU was subdivided into several units depending on scale of work and availability of funds. Construction together with maintenance was done labour-intensively. Remarkably, haulage, a major component of earthworks was accomplished by specially designed donkey carts in Botswana (Muatjetjeja, 2006).

Site organisation, as indirectly depicted by Figure 5.3, was such that works were packaged appropriately into individual group tasks; output-based remuneration was adopted. Each group, known as *gang* was controlled by a gang-leader who reported directly to a senior gang-leader. Thus, performance in terms of quality and quantity of construction was closely monitored. Method of remuneration was based on a combination of task accomplished and daily wage where deemed suitable. Initial daily wage rate was P2.10 which represented about nearly 80% of the Government's minimum wage rate in the public sector (Tajgman and de

Veen, 1998). According to these authors, it was reasonably good and was able to attract the required labour pool and commensurate productivity.

5.2.4 Training of Programme Implementers

The Ministry of Local Government and Lands was financially responsible for the training of programme staff and logistics at the Road Training Centre of the Ministry of Works and Communications (Watkins et al,1896). All things being equal, adequate but relevant training should form the bedrock of any successful infrastructure programme. Training under LG34 was robust with detailed manuals developed by ILO. Setting a threshold entry qualification expedited the training component. Training was carried out under strict discipline with paramount importance given to character and competence (Mayer and Kayira, 1997). In contrast to the Gang group which constitutes the casual labourers, positions from Technical Assistants upwards were permanent and pensionable.[9] *Gang-leaders* were primarily road construction builders, and senior *gang-leaders* were charged with greater technical and organisational duties; the latter sub-category represented an additional pool of manpower from which Technical Assistants and Technical Officers were drawn for further training.[10]

Relevant courses given to *gang-leaders*, for example, included both technical and management issues relating to labour-intensive road construction and maintenance such as the profile method of road setting out, level of road, drainage systems; scope and quality standards of work; measurement of work; road construction processes; labour productivity and setting of appropriate task rates.[11] At District Council Road Units, *gang-leaders* underwent six months site experience on probation. Sacrificing this lead-in time, for the all-important training component, is tantamount to compromising quality of product and programme failure.

Technical Standard of construction: Actual scope of work ranged from spot road improvement to new construction; activities included bush clearing, excavation of side drains

[9] McCutcheon, RT. 1992. Botswana: A description of the District Roads Labour-Intensive Improvement and Maintenance Programme. Development Southern Africa, vol 9(3), August 1992, pp269-294.
[10] Ibid.
[11] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

and drift construction, camber formation, and surfacing. The amount of work performed in each District Council Road Unit depended largely on availability of funding.[12] Tables 5.1a to 5.1c (adapted from McCutcheon, 1991) depict the training programme under LG34 and definition of the roles and responsibilities of participants.

[12] Ibid.

Table 5.1a: Training programme and responsibilities of participants (Botswana L-I programme)

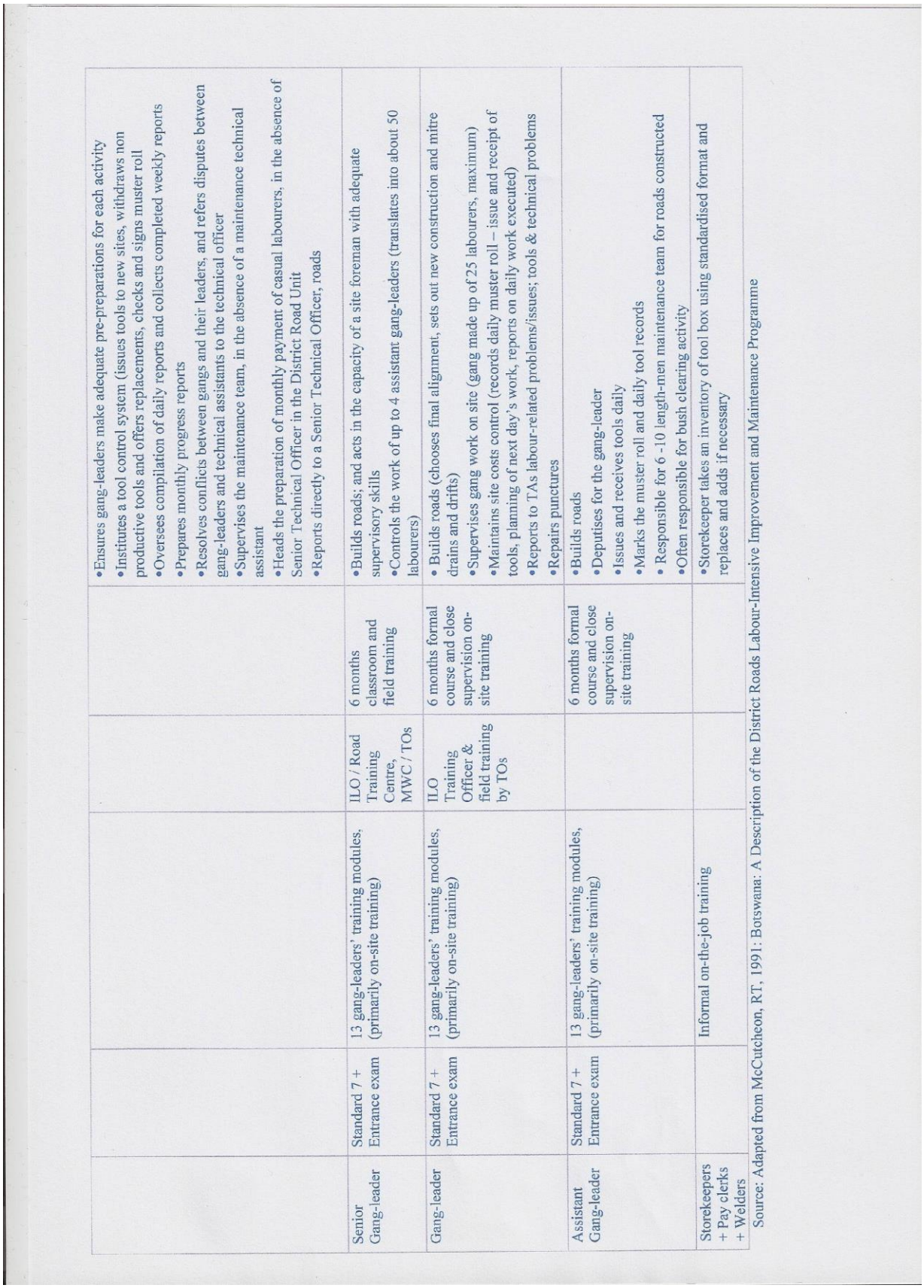
Table 1: LG34 Training programme and field duties of trainees

Target	Minimum Entry qualification	Training courses	Trainer	Duration of Training	Main field duties upon graduation
District Roads Engineer	First Degree in (Civil) Engineering				•Implements the LG34 Programme •Advises Ministry of Local Government and Lands regarding LG34 issues •Responsible to under-Secretary, Rural, for the LG34 programme •Collects and checks annual project memoranda submitted by each District and prepares annual budget proposals and fund allocations •Arranges for regular disbursement of funds to the districts •Monitors progress of the districts through monthly reports forwarded by Council Secretaries •Compiles monthly summary of progress and quarterly reports •Advises the Council Secretaries regarding LG34 programme (through the Permanent Secretary, at Ministry of Local Government and Lands) •Ensures that six-monthly expenditure report reaches the Ministry of Finance and Development Planning to order reimbursement from donor agency •Assists District CTOs & STOs in preparation of District rolling five year plans and annual plans / allocation of priorities •Prepares a rolling five year forward plan for the LG34 programme •Conducts field visits to check work progress •Liaises with the training programme •Liaises with the Unified Local Government Service regarding establishment of posts, and promotions, for example. •Liaises with other Ministries like Finance and Development Planning, Works and Communications (Roads Department), Home Affairs (Department of Labour) •Contributes to the preparation of every five year National Development Plan
Chief Technical Officer, CTO	General Certificate of Education	122 technical & management lessons in labour-intensive courses + additional short courses (in technical + organisational issues specific to managing a labour-intensive District Council Road Unit, DCRU)	ILO / Road Training Centre, MWC	A 3-year technician course	•Prepares a rolling five year plan listing routes for construction & priorities & administrative processes •Monitors the flow of funds as indicated by the monthly progress report, and request for additional funds prior to when needed, if necessary •Prepares an annual District Project Memorandum for the LG34 programme, based on annual plans submitted by Senior Technical Officer, Roads •Prepares an estimate of recurrent expenditure for the following financial year •Prepares construction priority list (as advised by Senior technical Officer, roads) • Supervises and controls work of STOs, heads of Works Departments • Teaches other Road Training Centre students in labour-intensive methods •Reports DCRU operations directly to the Council Secretary

Table 5.1b: Training programme and responsibilities of participants (Botswana L-I programme)

						•Completes monthly reports for the District Roads Engineer via the Council Secretary and Permanent Secretary, MLGL •Performs high level official duties in terms of government policies (e.g. aims and objectives of LG34 programme): awareness, understanding, and interpretation)
Senior Technical Officer, STO	General Certificate of Education	122 technical & management lessons in labour-intensive courses + additional short courses (in technical + organisational issues specific to managing a labour-intensive DCRU)	ILO / Road Training Centre, MWC	A 3-year technician course		•Prepares detailed annual plans for the District Council Roads Unit •Surveys new routes in terms of alignments and selected betterment •Supervises work of technical assistants in the subunits and controls production rates •Liaises between District Council Road Unit and other sections of the Works Department within the Council •Supervises activities of District Council storekeepers, e.g. procurement of new tools and equipment, and authorisation of payments •Supervises DCRU office administration, e.g. oversees the preparation of monthly casual labourers payments •Checks monthly sub-unit reports •Contributes to the preparation of the rolling five year programme, e.g. arranging traffic volume studies •Prepares regular monthly progress reports for the Chief Technical Officer •Resolves conflicts between gang-leaders & supervisors, and refers ones between supervisors and senior technical officers to the CTO • Supervises the supervisor in charged with District road maintenance •Monitors District Council Road Unit progress • Teaches other Road Training Centre students in labour-intensive methods
Technical Officer, TO	General Certificate of Education	122 technical & management lessons in labour-intensive courses + additional short courses (in technical + organisational issues specific to managing a labour-intensive DCRU)	ILO / Road Training Centre, MWC	A 3-year technician course		•Supervises not more than 5 Technical Assistants • Teaches other Road Training Centre students in labour-intensive methods
Technical Assistant, TA	Junior Certificate	Includes 90 lessons in labour-intensive methods + field work in a DCRU + additional training in technical + organisational issues	ILO / Road Training Centre, MWC/ TOs	A 2-year road supervisors' course + 8 weeks additional training		•Construction of a technically sound road with regard to quality standard and safety •Prepares detailed annual plans concerned routes for submission to the TO •Conducts community participation and pre-feasibility studies with beneficiary communities • Recruits and dismisses labourers •Responsible for supervision of 4 to 6 gang-leaders (translates into 100 – 300 labourers) •Gives field and administrative support to 2 – 3 senior gang-leaders •Discusses weekly work plans with gang-leaders and issues control forms

Table 5.1c: Training programme and responsibilities of participants (Botswana L-I programme)



Senior Gang-leader	Standard 7 + Entrance exam	13 gang-leaders' training modules, (primarily on-site training)	ILO / Road Training Centre, MWC / TOs	6 months classroom and field training	•Builds roads; and acts in the capacity of a site foreman with adequate supervisory skills •Controls the work of up to 4 assistant gang-leaders (translates into about 50 labourers)	•Ensures gang-leaders make adequate pre-preparations for each activity •Institutes a tool control system (issues tools to new sites, withdraws non productive tools and offers replacements, cheeks and signs muster roll •Oversees compilation of daily reports and collects completed weekly reports •Prepares monthly progress reports •Resolves conflicts between gangs and their leaders, and refers disputes between gang-leaders and technical assistants to the technical officer •Supervises the maintenance team, in the absence of a maintenance technical assistant •Heads the preparation of monthly payment of casual labourers, in the absence of Senior Technical Officer in the District Road Unit •Reports directly to a Senior Technical Officer, roads
Gang-leader	Standard 7 + Entrance exam	13 gang-leaders' training modules, (primarily on-site training)	ILO Training Officer & field training by TOs	6 months formal course and close supervision on-site training	• Builds roads (chooses final alignment, sets out new construction and mitre drains and drifts) •Supervises gang work on site (gang made up of 25 labourers, maximum) •Maintains site costs control (records daily muster roll – issue and receipt of tools, planning of next day's work, reports on daily work executed) •Reports to TAs labour-related problems/issues; tools & technical problems •Repairs punctures	
Assistant Gang-leader	Standard 7 + Entrance exam	13 gang-leaders' training modules, (primarily on-site training)		6 months formal course and close supervision on-site training	•Builds roads •Deputises for the gang-leader •Issues and receives tools daily •Marks the muster roll and daily tool records • Responsible for 6 -10 length-men maintenance team for roads constructed •Often responsible for bush clearing activity	
Storekeepers + Pay clerks + Welders		Informal on-the-job training			•Storekeeper takes an inventory of tool box using standardised format and replaces and adds if necessary	

Source: Adapted from McCutcheon, RT, 1991: Botswana: A Description of the District Roads Labour-Intensive Improvement and Maintenance Programme

Source: Adapted from McCutcheon, 1991a

5.2.5 LG 38: Labour-intensive Public Works Schemes

Unemployment, underemployment and rural-urban migration were national crises in the 1970s (Republic of Botswana, 1977). In 1975 the government of Botswana commissioned the ILO, assisted by government officials, to conduct feasibility studies into possible use of employment-intensive construction methods in the implementation of public works projects within the Districts (ibid). The ILO identified viable projects such as construction of rural feeder roads, water supply works, firebreaks and small dam construction for implementation scheduled to start in the 1978/79 fiscal year at an estimated total cost for the National Development Plan V (1979 TO 1985) period of P4.3 million (Egner, 1986). The scope of works was larger than LG34. Of the projected budget, SIDA contributed P1.21million whereas P2.75 million came from domestic development funds.

The LG38 in practice turned out to be a drought relief programme with the twin problems of poor supervision and low productivity though different evaluations provided varying views (Mayer and Kayira, 1997). Drought relief programmes are safety nets in nature with the primary aim of providing emergency assistance to the needy. Thus emphasis was on relief and not necessarily on quality of product, which only comes about through adequate technical programme staff, good preparation, and extensive but relevant training prior to construction. These basic ingredients were missing from the LG38 programme.

LG38 was shrouded with serious weaknesses to the point of collapse. Shortcomings included the following:[13]

- Inadequate training
- Lack of lead-in time resulting in insufficient preparation
- Poor planning
- Inadequate capacity of the implementing agencies. Lack of technical skills resulted in improper programme documentation and poor quality products
- Misallocation of funds
- Failure to secure funding for earmarked projects. Requisitions for funds were only released upon approval by the Ministry of Local Government.

[13] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

> However, about 50% of requisitions were not approved due to lack of human capital in the above-mentioned Ministry.

Out of the total budget of P4.3 million, 81% was spent mainly on emergency labour-based drought relief projects between1982 to 1983 (Egner, 1986). Subsequent years witnessed expansion in the drought relief projects under DR (drought relief) relief project number 25. According to Egner (1986), LG38 was completely eclipsed by the powerful DR25 drought relief programme, the wages of which were comparatively higher, to the extent that all supervisory staff became preoccupied with the DR 25. Money was spent within short timeframes irrespective of quality of product. By 1983, the LG38 programme had completely lost direction; it became dormant and was eventually combined with LG34 to remedy the situation.

5.2.6 LG34 Programme under LG117, Labour-Intensive Public Works Programme

In the 1990s the Government of Botswana merged the LG34 and LG38 to boost efficiency and quality of work under a labour-intensive Public Works Programme, against cautions from donor agencies about the hybridisation.[14] However, even under a severe working environment, wages were below the statutorily recommended minimum and therefore unattractive. LG 117 produced mixed results. From 1990 to 1995, the labour-based rural roads programme employed approximately 3,500 people per annum (Mayer and Kayira, 1997) which translates into the creation of about 17 500 jobs. Despite these achievements, high labour turnover due to the unattractive wage and absenteeism significantly impacted the level of supervision and productivity achieved under the LG34 programme alone.[15]

NORAD achieved its aim of selling the idea of labour-intensive methods to the Government of Botswana, but the latter's commitment to succeed was absent. Eventually, NORAD's withdrawal after the government's refusal to abandon the integration of LG34 and LG38 programmes, also brought the collapse of the LG 117. The current programme, LG1107 is also of relief nature though wrongly termed labour-intensive Public Works Programme.[16]

---

[14] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr. M. Muatjetjeja is aformer student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.
[15] Ibid.
[16] Ibid.

The purpose is to provide temporary relief to the unemployed and the onus is on the District Councils to identify and prioritise labour-intensive projects.[17] Contractors are employed to execute the projects labour-intensively through competitive bidding.[18] However, instead of developing this into a strong force, several restrictions have succeeded in keeping wages below market prices. With every forecast of drought, LG1107 is boosted through another substantial cash injection by government to cushion the plight of the needy.[19] One disadvantage of this system is over-politicisation of drought relief programmes: authorities are quick to declare the country drought-stricken because of fresh and speedy financial support.[20]

5.2.7 Achievements: Results, Outcomes and Impact on Poverty Alleviation

5.2.7.1 Physical achievement since 1980

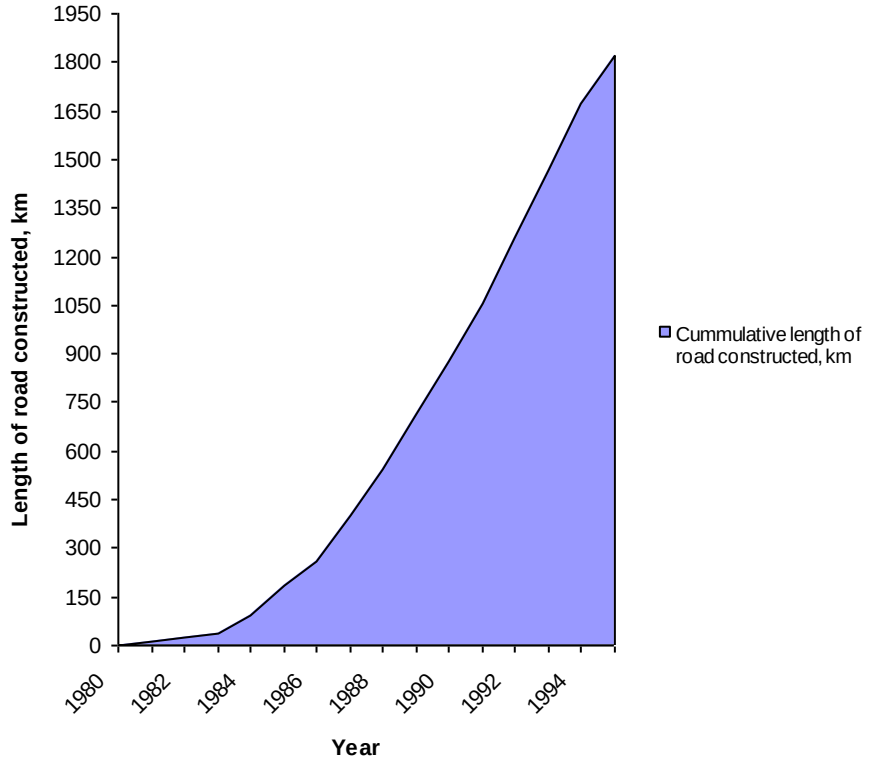


Figure 5.4: Cumulative length of road constructed, km

Source: Adapted from Bruderfors et al, 1995, cited in Mayer and Kayira, 1997

[17] Personal Communication: Molojwane to Quainoo, 2007. Mr. R. Molojwane is the Principal Development Officer, Ministry of Local Government and Development Planning, Gaborone, Botswana.
[18] Ibid.
[19] Ibid.
[20] Ibid.

- Length of road constructed and maintained – over 1820 km
- Unit cost of 5.5 m road width (at 1995 prices) – P 20 000 per km
- Employment generated – over 10 000 of which casual labourers were more than 70%.
- Total expenditure (LG34 only) – P3.01 million (1979-1985)
- Labour intensity (labour cost/ total project cost) – 65%
- Percentage of women supervisors – 40%
- Training results: 145 supervisors and other senior staff trained by 1990.

  Breakdown is as follows:
  - 81 gang-leaders
  - 19 senior gang-leaders
  - 21 maintenance team leaders
  - 18 technical assistants
  - 6 technical officers
  - 40% women supervisors
- Effectiveness of institutional framework: Establishment of labour intensive Road Units in all nine Districts to complement work at MLGL
- Labour productivity - high under LG34 but slipped after merger with LG38
- Maximum utilisation of local resources, tools and equipment for programme implementation

Technically, the standard of construction produced was high in terms of riding quality and maintainability and was cost-effective (Watkins et al, 1986). This may be attributed to the effective and relevant training given to the road builders and close on-site supervision.

5.2.8 Reasons for success

These factors are in relation to the LG34 programme:

- Strong government support for the LG34 programme
- Commitment by all stakeholders including beneficiaries
- LG34 was initially separated from the institutionalised but inadequately planned drought relief programme
- Training was extensive, relevant and properly targeted
- Adequate lead-in time was appropriately allowed for thorough preparation, evaluation of pilot project, viable institutional settings, and training of programme staff and implementers
- Construction method maximised the use of locally manufactured resources and materials
- Strategic balance struck between centralisation and decentralisation for programme planning, management and administration; and ground implementation at District Council Road Unit level
- Good supervision that lead to high productivity and required quality of product
- Proper organisation, both administratively and on-site, with roles and responsibilities unambiguously defined and clear lines of authority and accountability.

5.2.9 Problems and Shortcomings

LG34 programme was a huge success with considerable good practices for governments and development planners and engineers. However, for effective adaptation and replication elsewhere, certain pitfalls and shortcomings should be adequately addressed.

First, wage rates became comparatively lower over time without any significant adjustments in keeping with socio-economic realities. In addition, differential wage policy pursued by Government of Botswana has made labour-intensive construction unattractive. This resulted in sliding productivity and high labour turnover in favour of the agricultural sector and the relief programmes which were less demanding but with a similar remuneration package.

Even at the attractive daily wage of P2.10 (for 8 hours per day) at inception of the LG34 programme, monthly labour turnover was about 15% (Tajgman and De Veen, 1998). Thus lack of requisite labour availability due to low wages contributed significantly to the eventual collapse of the programme.[21] Comparative wage analysis data by Botswana Institute for Development Policy Analysis (BIDPA, 1996) cited in Mayer and Kayira (1997) indicates the lack of real commitment to labour-intensive construction and poverty alleviation. Tables 5.2a and 5.2b capture some of these concerns.

Table 5.2 a: Comparison of Monthly Wages under LG117 with Statutory minimum wages in selected sectors and Poverty Datum Line

Year	LG117, wages, P/month	Poverty Datum Line, PDL	LG117 /PDL, %	Construction minimum wage, P	Gov't of Botswana minimum, P	Roads Department minimum, P
1994	116	229	50.6	258	322	355
1995	126	252	50.0	267	348	383
1996	133	286	46.5	287	365	402

Source: BIDPA, 1996, cited in Mayer and Kayira, 1997

Percentage comparison with statutory and government minimum wages in Table 5.2b reveals serious inconsistencies in poverty alleviation through labour-intensive works. On the average, the labourer on LG34 programme earned approximately 49% of the minimum required to make an impact on poverty and about 46% compared to the construction minimum wage. Related to Government's (and Road Department's) minimum wages, the LG34 worker was earning between 33% – 36% of stipulated thresholds. Therefore LG34 started losing workers to the drought relief programme. There was higher turnover of labourers and experienced technical officers due to lack of motivation stemming from poor general conditions of work for technical staff. The trend destroyed morale and encouraged labour-pool to drift to other more rewarding sectors. According to personal communication with Mutjetjeja, (2007) the gravity of this low-wage phenomenon has reached an extent that it de-motivates civil engineers who are currently working in the labour-intensive field and renders the sector an unattractive option.

[21] Personal Communication: Molojwane to Quainoo, 2007. Mr. R. Molojwane is the Principal Development Officer, Ministry of Local Government and Development Planning, Gaborone, Botswana.

Table 5.2b: Comparison of Monthly Wages under LG117 with Statutory minimum wages in selected sectors and Poverty Datum Line

Year	LG117 /PDL, %	LG117 / Construction minimum wage,%	LG117/Gov't of Bots. minimum wage,%	LG117/ Roads Dept. Min. Wage, %
1994	50.6	45.0	36.0	32.7
1995	50.0	47.2	36.2	32.9
1996	46.5	46.3	36.4	33.1

Source: Apart from LG117/PDL ratios, the rest are author's own calculation derived from Table 5.2 a.

To date, low wages continue to plague the employment-intensive construction sector in Botswana. Arguably, it helps to achieve effective targeting of the needy. But how much percentage targeting is reasonable? One school of thought sees the low wage rates as a systematic attempt to discourage employment-intensive methods in favour of conventional ones (Muatjetjeja, 2006). This is reflected in some government-imposed restrictions (regarding current labour-intensive road programmes which aim at producing good infrastructure) such as *do not allow the labour-intensive programme to stifle the national programmes to the disadvantage of the private sector*.[22] Hence for labour-intensive construction technology to be accorded its rightful role in poverty alleviation, decent but appropriate wage setting, commensurate with productivity, should form a cardinal principle. One major lesson reported by Tajgman and de Veen (1986) is that *where possible, collective bargaining and involvement of the social partners in setting wages and other employment conditions specifically for the labour-based construction sector should be considered.*

Second, inability to localise key positions at the closure of the programme was a serious threat to its technical sustainability (Watkins et al, 1986; McCutcheon, 1991; Muatjetjeja, 2006). Programme evaluation indicated that all key positions were headed by expatriates, except instructors of gang-leaders on-site training. Thus, knowledge management including succession issues was largely ignored.

Third, the amalgamation of LG34 – a labour-intensive programme that involved good preparatory work – with LG38 – essentially a drought-relief programme which was an emergency response to crisis associated with little training in labour-intensive methods, poor

[22] Personal Communication: Molojwane to Quainoo, 2007. Mr. R. Molojwane is the Principal Development Officer, Ministry of Local Government and Development Planning, Gaborone, Botswana.

productivity and high worker absenteeism (Tajgman and de Veen, 1998) – was a serious mistake. In particular, there were reports of sub-standard products and general inefficiencies after merger (Muatjetjeja, 2006). For economic efficiency and quality of product, therefore, every effort must be made to define and separate employment-intensive programmes and emergency relief programmes.

Fourth, the task work system of payment was abandoned in preference for daily wage after the merger. One immediate development was increasing worker-days per kilometre which invariably impacts the cost of road per kilometre: on the average was about P20 000 which was considered too high (Watkins et al,1986), though other cost drivers such as nature of landscape and types of drainage structures required were also cited. However, as recommended by Mayer and Kayira (1997), task-based remuneration, which is tied to productivity, should be the norm because of its efficiency.

Botswana became rich, with GDP per capita reaching the middle-income bracket. Consequently, donor agencies withdrew their support. However, the programme failed to sustain itself contributing in part to its collapse (Muatjetjeja, 2006). Despite its technical categorisation as a middle-income country, unemployment in Botswana is one of the highest amongst such economies (IMF, 2007). In addition, the mineral sector is capital-intensive offering little employment potential (World Bank, 1993). Equally, the narrow economic base of Botswana should encourage the government to seriously consider employment-intensive methods and upscale it in fighting at least rural poverty through infrastructure development.[23]

Field visits and personal communications conducted revealed poor knowledge management particularly with regard to the LG34 and LG117 employment-intensive programmes. Specifically, reporting systems were poor and information scanty and scattered.[24] This has serious implications for managing development programmes. First, good practices and lessons for future programmes would be inaccessible. In effect, the wheel must be reinvented

[23] IMF, 2007. Botswana: Selected Issues and Statistical Appendix. IMF Country Report Number 07/228. Washington D.C. p25.

[24]Personal Communications: Muatjetjeja and Molojwane to Quainoo, 2007. Mr. M. Muatjetjeja is a former student at the University of the Witwatersrand but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana; Mr. R. Molojwane is the Principal Development Officer, Ministry of Local Government and Development Planning, Gaborone, Botswana.

each time similar interventions are initiated; this impacts on programme duration, budget and effort that could be expended elsewhere within the programme. Second, without well-documented, archived and easily retrievable programme information, improvements in design, construction and management of similar future programmes is minimal. On the same note, it defeats the aims and objectives of programme evaluation, and casts doubts about commitment of the main LG34 stakeholders. Probably the unfavourable later developments within the LG34 programme discouraged any form of sound management of knowledge gained during the earlier stages.

Comparison of current employment-intensive programmes in Botswana with the stand-alone LG34 programme in the 1970s and 1980s indicate that lessons learnt were never incorporated into their planning, design, construction and management.[25]

Despite the apparent problems and shortcomings, different evaluations about LG34 and developments under LG117 indicate that in general, the programmes achieved most of their objectives with good quality standard of maintainable roads constructed (Austveg et al, 1995, Scott Wilson Kirpatrick, 1993; cited in Mayer and Kayira, 1997).

5.2.10 Lessons and Conclusions

Results of the LG34 labour-intensive programme indicate that success of such interventions hinges largely on the nature, adequacy and relevance of training provided; good lead-in time for preparatory work; and setting up of effective and robust institutional systems (Muatjetjeja, 2006; Mayer and Kayira, 1997).

It achieved most of its objectives in terms of physical asset creation of good riding quality, employment generation, setting up of institutions and human capital development to construct District Council roads and maintain them. Accordingly, this performance earned the LG34 programme both local and international recognitions with the Botswana government declaring it a national asset (Muatjetjeja, 2006).

[25] Personal Communication: Muatjetjeja to Quainoo, 2007. Mr.M. Muatjetjeja, is a former student at the University of the Witwatersrand, but now senior lecturer at University of Botswana, completed his MSc (Civil) Engineering by investigating labour-intensive work in Botswana.

Commitment (from politicians, government departments and relevant stakeholders) to succeed is crucial in employment-intensive construction programmes. It gives strategic direction to the programme, and ensures timely release of requisite resources for implementation.

The S-curve relating time (in years) to cumulative length of road constructed is significant to any properly set-up employment-intensive construction programme: adequate lead-in time is required for institutional settings and good preparation. Thus, contrary to political pressure, no *tangible* results should be expected during the first three to five years. Any fast-tracking to implement employment-intensive programmes without due preparation and training, which is time consuming but rewarding, can only guarantee inordinate problems translating into time overruns, cost overruns and possible failure.

Present state of labour-intensive programmes: No serious commitment given, on the false assumption that the country has moved from a low- to middle-income economy and therefore no need for this method of construction. One practical step to discourage labour-intensive programmes has been the unacceptably low wages. Paradoxically, despite the high income growth per capita, Botswana's Gini Coefficient remains one of the highest in the world, indicative of the degree of poverty even in the wake of the economic boom (UNDP, 2008).[26]

Deriving from problems and shortcomings of LG34, despite the huge success, two major lessons put forward by Muatjetjeja (2006) were that:

- Workers in labour-intensive programmes must be remunerated appropriately; and

- Labour-intensive work must be kept separate from drought relief programmes which hardly led to development.

Setting appropriate wage rates has the potential of attracting the necessary manpower and boosting productivity through adequate supervision and innovations. Furthermore, drawing the line between employment-intensive works and emergency relief programmes would

[26] According to UNDP 2007/2008 Report on Human Development, Botswana's Gini Coefficient, an indication of disparity in income distribution, is approximately 61%.

ensure that the necessary preparation, training and other essential ingredients for success are given due consideration.

As in Kenya, the innovative[27] system of employment of casual labour used in the LG34 and other programmes in Botswana was highly successful.

The lessons drawn above support the research hypothesis. Albeit, despite the availability of funding, the programme later collapsed because of lack of government commitment to the planned construction method. Labour-intensive construction methods of construction were gravely discouraged in favour of machine-intensive construction. The demise of the programme was hastened by a false technical assumption that Botswana was no longer a low-income country. The Norwegian Agency for Development's decision was ill-conceived because despite the economic growth, high incidence of poverty persists in the country.

[27] Innovative in the sense that the daily wage paid was tied to output productivity: output based remuneration.

CHAPTER 6: CASE STUDY 4: MALAWI: LABOUR-INTENSIVE ROAD CONSTRUCTION PROGRAMMES

6.1 Introduction

The Republic of Malawi, formerly Nyansaland, is a landlocked country, densely populated with a high and pervasive incidence of poverty (UNESCO, 2004), occupying approximately 118 484 square kilometres of land, and sharing borders with Tanzania, Zambia, and Mozambique. The country is divided into three regions (Northern, Central and Southern regions) subdivided into 28 districts (24 districts at the beginning of DRIMP) and at least 40 Local Authorities or District Assemblies (Republic of Malawi, 2004). Figure 6.1 depicts the total road network of Malawi and the classification thereof. As a landlocked country, every effort must be made to reduce the heavy transportation costs that impact on business transactions. The country depends primarily on agriculture (particularly tobacco, tea and sugarcane) with the sector employing about ninety (90) percent of the population and accounts for about thirty- three (33) percent of GDP (CIA, 2007).

At the dawn of independence in 1964, the country had about 10128 km of road network which rose to 10702 km in 1975 when the first labour-intensive road programme commenced in the country (Ngoma, 2003). Current total road network is about 15 451 km of which 6956 km are paved and 8495 m unpaved (CIA, 2007).

More than 85% of Malawians are rural with subsistence agriculture as the main occupation. However, lack of mobility was a drawback to economic growth. Therefore, the importance of roads in rural development and provision of an adequate rural transportation system encouraged the first government (and the Districts councils and District Commissioners) to embark upon construction and maintenance of roads, bridges and schools (Republic of Malawi, 2004). Much as these worthwhile efforts were carried out by the youth, these self-help projects were not standardised, not properly coordinated, producing mixed quality of work. However, they paved the way for first labour-intensive District Road Improvement and Maintenance Programme (DRIMP) in the 1980s, followed by other poverty alleviation programmes such as the Malawian Social Action Fund (MASAF) in the 1990s, Central Region Infrastructure Maintenance Programme (CRIMP), Rural Accessibility and Mobility Pilot Activity (RAMPA) and Government of Malawi / EU Public Works Programme thereafter.

Together, these labour-intensive programmes have constructed and maintained over 14 000 km of earth roads, providing access to market centres for agricultural produce and assisting in alleviating poverty (Ngoma, 2003). Financial constraint is the major setback to the continuity of these successful programmes. Otherwise, the level of technical preparation, administration and organisation indicate that with adequate and readily available funding, the potential for huge success is inevitable.

At this juncture, only two notable programmes, namely the DRIMP and MASAF with small reflections on Public Works Programme in the 2000s would be described and discussed, examining reasons for their success and the good practices embraced. To derive maximum lessons from them, it is also appropriate to investigate the problems and shortcomings encountered in order to achieve a higher degree of programme outcomes in the future.

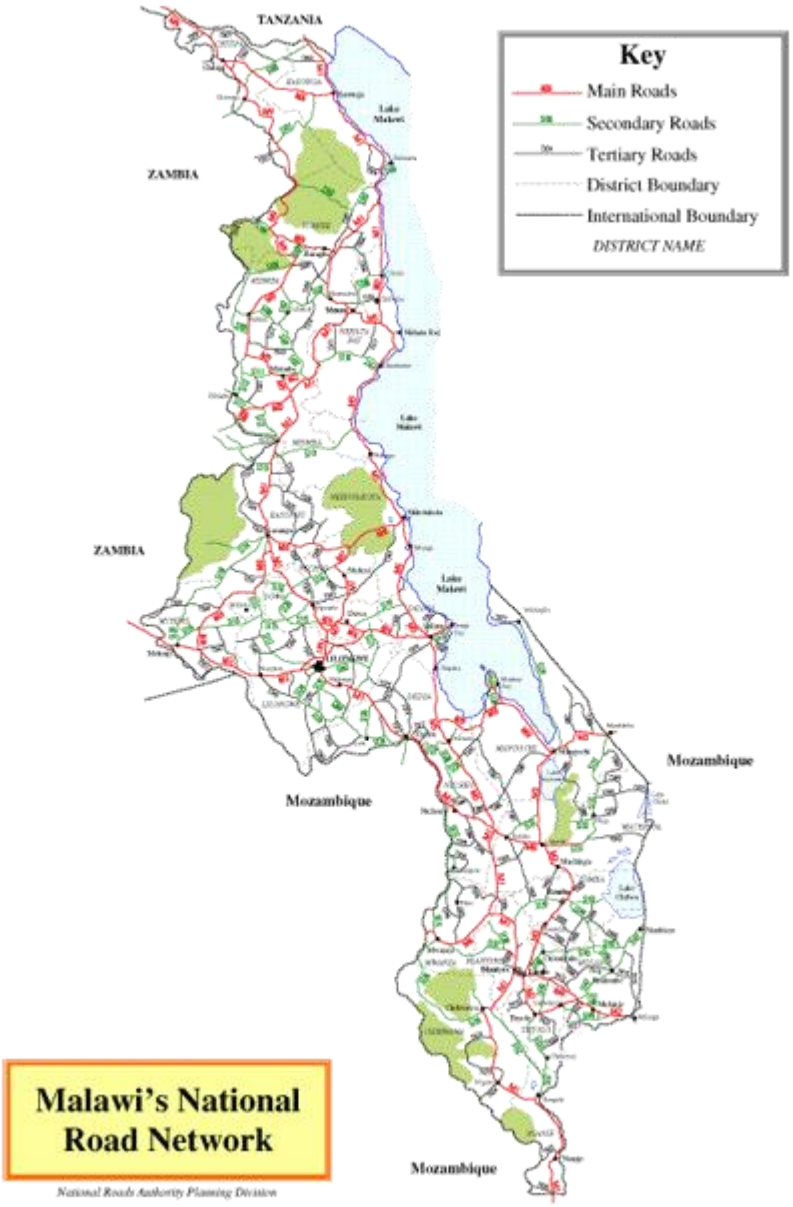


Figure 6.1: Road Network of Malawi
Source: Malawi Roads Authority, 2008

6.2 The District Roads Improvement and Maintenance Programme (DRIMP) (1974 – 1990)

6.2.1 Introduction

Neglect of maintenance on the district roads largely due to resource constraints and technical inadequacies led to rapid and progressive deterioration of the unpaved road network in Malawi. For example, by 1980, the length of unpaved network had dwindled from 10255.9 km (in 1970) to 9459.5 km (in 1975) to 8858.5 km in 1980 (Ngoma, 2003). Taking advantage of the prior Youth Week Projects, essentially self-help projects, and labour availability and willingness to work, the DRIMP was initiated in 1974 as a structured, coordinated and standardised maintenance programme to open up the countryside for trade and commerce, and to help combat poverty. The main stakeholders were the Government of Malawi, the ILO and the World Bank which provided requisite technical and financial assistance for the programme.

The programme which used the force-account system, targeted district roads for improvement and maintenance, and was institutionalised within the Ministry of Works and Supplies (Ibid) of which the then President was the Minister as well. Therefore, using his position as a developmental arm, the programme enjoyed strong political commitment and financial support to make it work.[1] The ILO study conducted in 1986 concluded that DRIMP was highly successful and had been of significance, politically, socially, and economically to Malawi (Relf et al, 1986). Through the DRIMP, approximately 5500km of district roads were constructed and maintained labour-intensively (Ngoma, 2003). Institutional settings were put in place but the Government failed to decentralise DRIMP at the initial stages. Despite its own shortcomings, the DRIMP continues to be the reference point for all subsequent employment-intensive programmes in Malawi due to good practices employed that led to its success (Republic of Malawi, 2004).

[1] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.

6.2.2 Objectives at conception and implementation

The overall aim of DRIMP was to upgrade and maintain District roads to an acceptable all-weather access road standard. The main specific objective was to support rural development by improving accessibility to rural areas. This was to be achieved through rehabilitation and maintenance of over 5000 km of district roads (Ngoma, 2003).

In order to create employment and generate income within communities, the strategy adopted by the Government of Malawi was to use labour-intensive construction methods; though not without initial scepticism and reservations about its effect on the agricultural labour availability (ibid).

6.2.3 Source and structure of programme finance: mechanisms for planning and allocation of resources

The DRIMP was essentially a World Bank supported programme, assisted by ILO which provided technical support to the Government of Malawi. The Bank's financial support was mainly for the pilot programme and road improvements under DRIMP. Funds for maintenance however, were gradually reduced until the end of Phase Two. Under that arrangement, a formula was agreed upon whereby the Bank provided funding for 75% of incremental maintenance costs during the first year after improvement, followed by 50% in the second year and 25% in the third year.

6. 2.4 Institutional Framework and delivery mechanism

Instituted within the Ministry of Works and Supplies, this ten year employment-intensive programme was implemented in all the then 24 districts of Malawi using force account system. DRIMP targeted a specific network called the D- network or the District Road network. With a significant number of expatriates from both World Bank and ILO, DRIMP had adequate expertise to carry out needs assessment, planning, estimation of factors of production, design, implementation, monitoring and supervision of the programme.[2]

[2] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.

Good field operational manuals and standards were developed for the programme, including specifications for road width, culverts, drainage bridges, and road furniture. All these preparations were made on behalf of local governments because they had no capacity at the time, with the understanding that maintenance would be carried out by local authorities or the District Assemblies. The challenge was the need to build capacity and develop the human capital, while at the same time ensuring sufficient funding and requisite equipment for the work.[3]

From conception through piloting to full-scale national replication, DRIMP took more than a decade signifying the need for programme approach to poverty reduction through employment-intensive infrastructure development.[4] The roads maintenance programme was gradually developed as follows (Hagen and Relf, 1988): it first started as a road maintenance pilot programme in Kasungu District following recommendation by the International Development Agency (World Bank) two years prior to 1976. Objectives of the pilot programme were threefold (Hagen and Relf, 1988): (i) to ascertain the most effective and efficient methods of road maintenance in relation to a labour-equipment mix; (ii) determine requisite operational, training and budgetary needs; and (iii) to investigate the feasibility of replicating the pilot programme nationwide once successful.

As a result of the success of the pilot phase, the World Bank recommended that labour-based methods were to be used to execute subsequent projects. Consequently, DRIMP entered its first phase as a demonstration and trial project covering three additional districts from 1979 to 1981 having developed appropriate work methods, control measures and training for crucial staff (Ibid). This was then followed by Phase two whereby the programme was extended to nine more districts between 1981 and 1985. Prior to commencement of phase three, World Bank, the main financier, had embarked upon a declining funding of maintenance costs scheduled to end in 1985 (Hagen and Relf, 1988). Eventually, during the third phase of DRIMP, expansion was made to the remaining eleven districts. The preparation and gradual expansion of DRIMP to all 24 districts of Malawi took about thirteen years; and presents a useful case study for policy makers, planners, engineers and consultants about how to set up a successful national employment-intensive infrastructure programme taking cognisance of shortcomings and monitoring them for effective outcome (ibid).

[3] Ibid.
[4] Ibid.

Main operations include setting out of roads, site clearing and stamping, earthworks, drainage, gravelling and concrete works (Ngoma, 2003). Besides handtools used for the DRIMP, limited machinery was used to transport material and labourers to project sites (Ibid). DRIMP was a huge success: by 1987 it had constructed over 5000 km of good quality roads and transferred capacity to locals. Its success is largely due to effective organisation of the programme, availability of funding, training offered to stakeholders crucial to implementation as well as the high technical standard of construction developed.

6.2.4.1 Organisation, Training and Construction Methods

DRIMP was largely centralised and implemented labour-intensively by the Ministry of Works and Supplies. However, the Ministry managed to maintain a strategic balance between centralisation and decentralisation between the headquarters and Districts. As highlighted above, skills of expatriates were utilised to the full where local capacity was inadequate. Figures 6.2 to 6.4 show typical organisational charts for DRIMP for the execution of its operations.

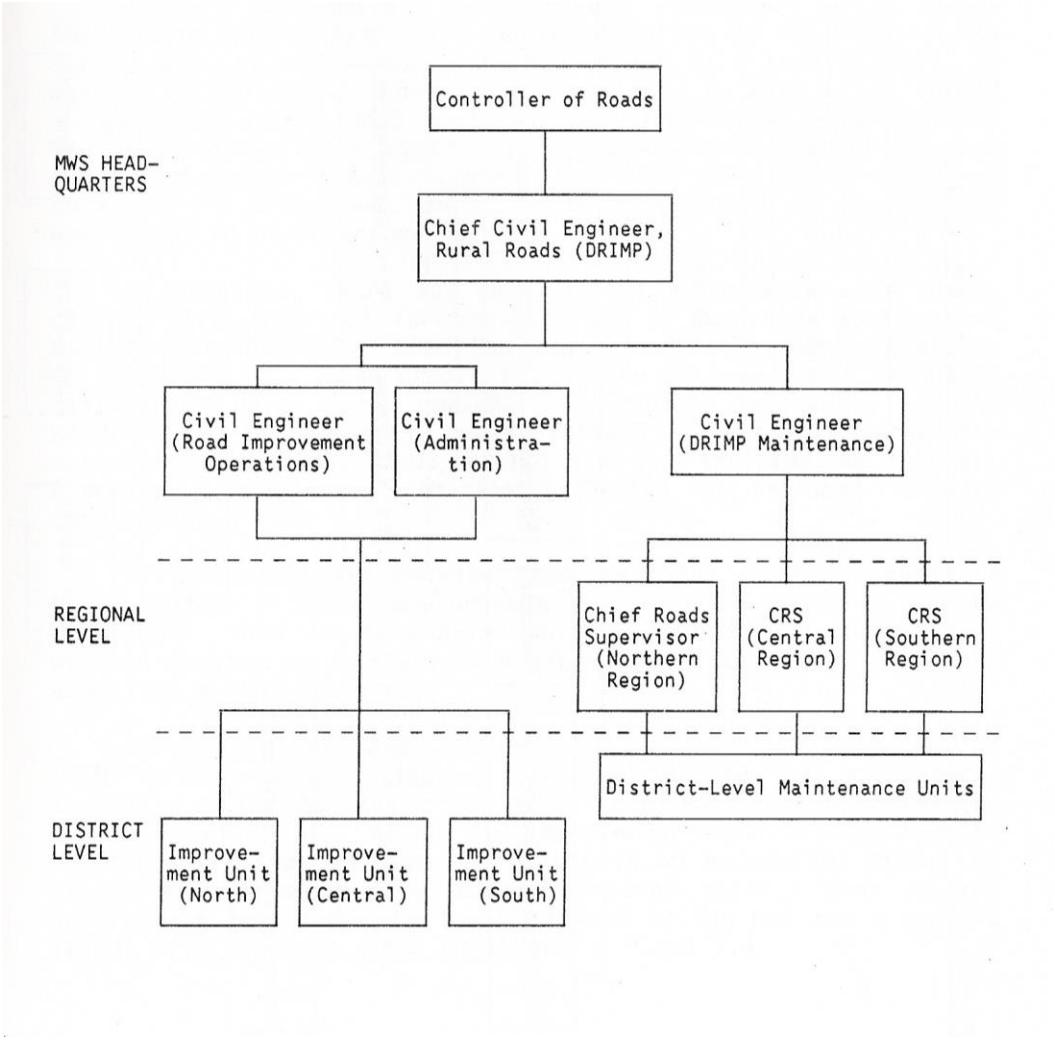


Figure 6.2: DRIMP: Basic Organisational Structure
Source: Hagen and Relf, 1988

As reported by Hagen and Relf (1988), the positions of Chief Civil Engineer and Civil Engineers charged with the responsibility for road improvement operations were filled by expatriates at the initial stages of the programme due to lack of capacity in the Ministry. The chart shows well-demarcated responsibilities between improvement and maintenance units with districts reporting directly to headquarters and regional roads supervisors respectively.

Isolated from the basic organisational structure, Figure 6.3 gives an indication of a typical road improvement unit organisation with British Volunteer Service Oversees staff as special advisor to the Roads Supervisor. Implicitly the organogram is indicative of the extent of training that was done for the success of the programme. Training had to be targeted at artisans including carpenters, mechanics and foremen together with plant operators, storekeepers and account clerks and others.

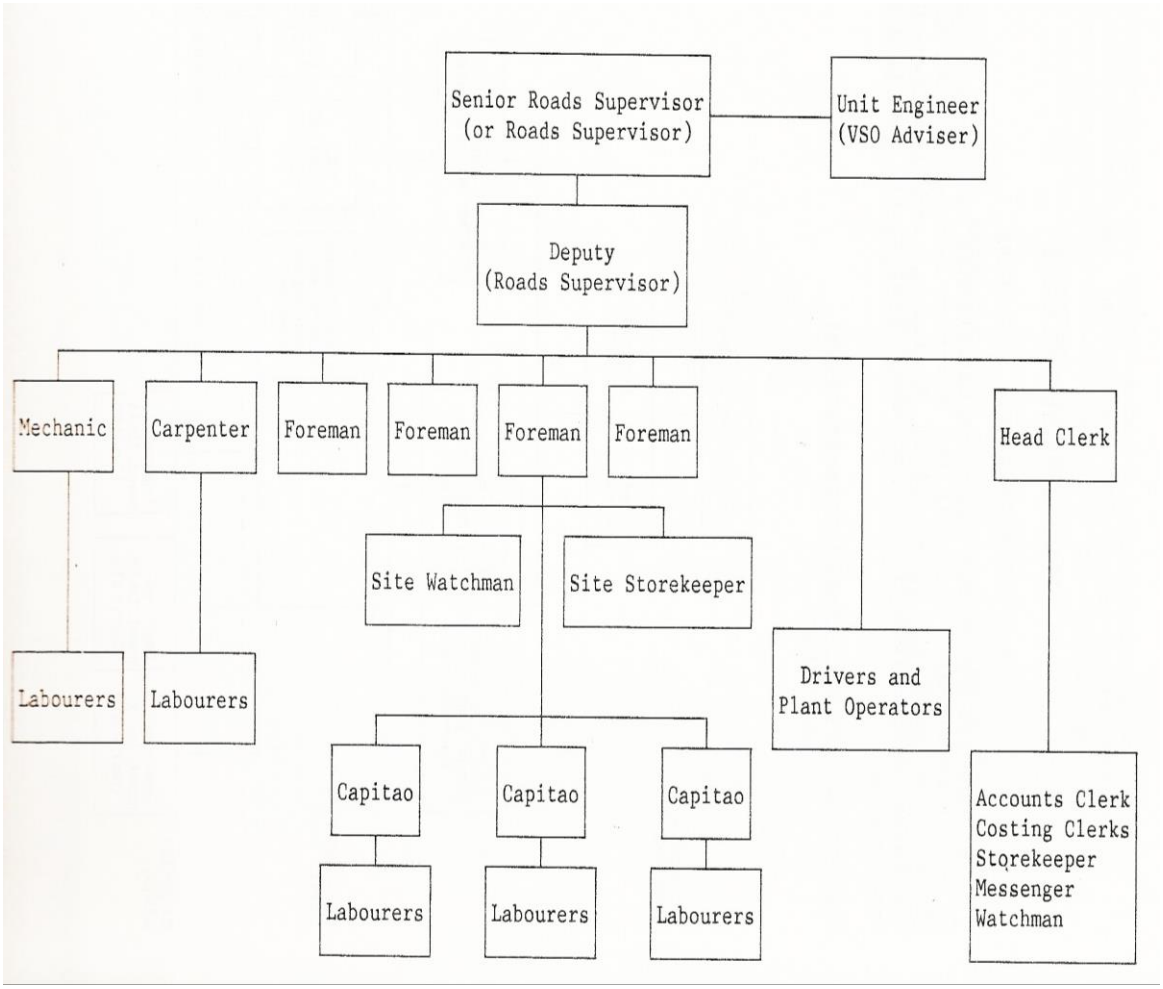


Figure 6.3: Organisation of a typical DRIMP improvement unit
Source: Hagen and Relf, 1988

Site organisation was well designed. According to Hagen and Relf (1988), each improvement unit was responsible for not more than 15 sites with road foremen as supervisors and employing a total of 2250 casual labourers. The three improvement units could employ between 5000 and 6000 casual labourers. In addition to daily operations and supervision, these foremen were delegated the authority to recruit and effect payment of labourers within 5 to 8 kilometre radius of the project site.[5] Labourers were grouped into a gang of 25 to 30, each headed by a leader otherwise known as the *capitao* who reported directed to the foreman or supervisor (Hagen and Relf, 1988).

[5] Hagen, S, and Relf, C, 1988. The district road improvement and maintenance programme: better roads and job creation in Malawi; ILO, Geneva and World Employment Programme.

Labour-intensive construction methods are management-intensive, particularly with regard to progress and quality of product. To monitor programme performance, therefore, a good recording and reporting system was devised similar to the earned value management system used today directly or indirectly by project managers (Fleming and Koppelman, 2002). In effect, four standardised reporting methods developed were as follows (Hagen and Felf, 1988):

(a) site records of inputs in terms of labour and materials;
(b) costs of each input in (a);
(c) value of work achieved based on actual quantities of work completed (measured by the unit engineer) compared with projections
(d) comparison of the percentage accomplishment of the value of work done against expenditure actually incurred

Besides sending a selected number of engineers for training in labour-intensive construction methods at Kisii Training Centre in Kenya,[6] extensive training of foremen was also carried out by the Ministry of Works and Supply (Hagen and Relf, 1988). Accordingly, the Ministry established training centres in Lilongwe and Zomba for training foremen and or supervisors in both equipment-based and labour-based methods of road construction.[7] Labour-based methods of construction aimed at DRIMP foremen covered two main sets of courses over a duration of 21 months, namely:[8]

- First course: organisation of an improvement unit; recruitment and dismissal of labour; administrative routine, planning and reporting; organisation of construction, work supervision; and
- Second course: structures such as bridges; and storm-water drainage systems like drifts, fords and multiple culvert lines; different structural materials; reporting and control of structures work.

[6] Personal Communication; Ngoma to Quainoo, 2007. Blantyre, Malawi. Dr. I. Ngoma is the Director of Malawi Transportation Technology Transfer Centre located within Department of Civil Engineering, The Polytechnic University of Malawi.

[7] Hagen, S, and Relf, C, 1988. The district road improvement and maintenance programme: better roads and job creation in Malawi; ILO, Geneva and World Employment Programme.
[8] Ibid, p40-41

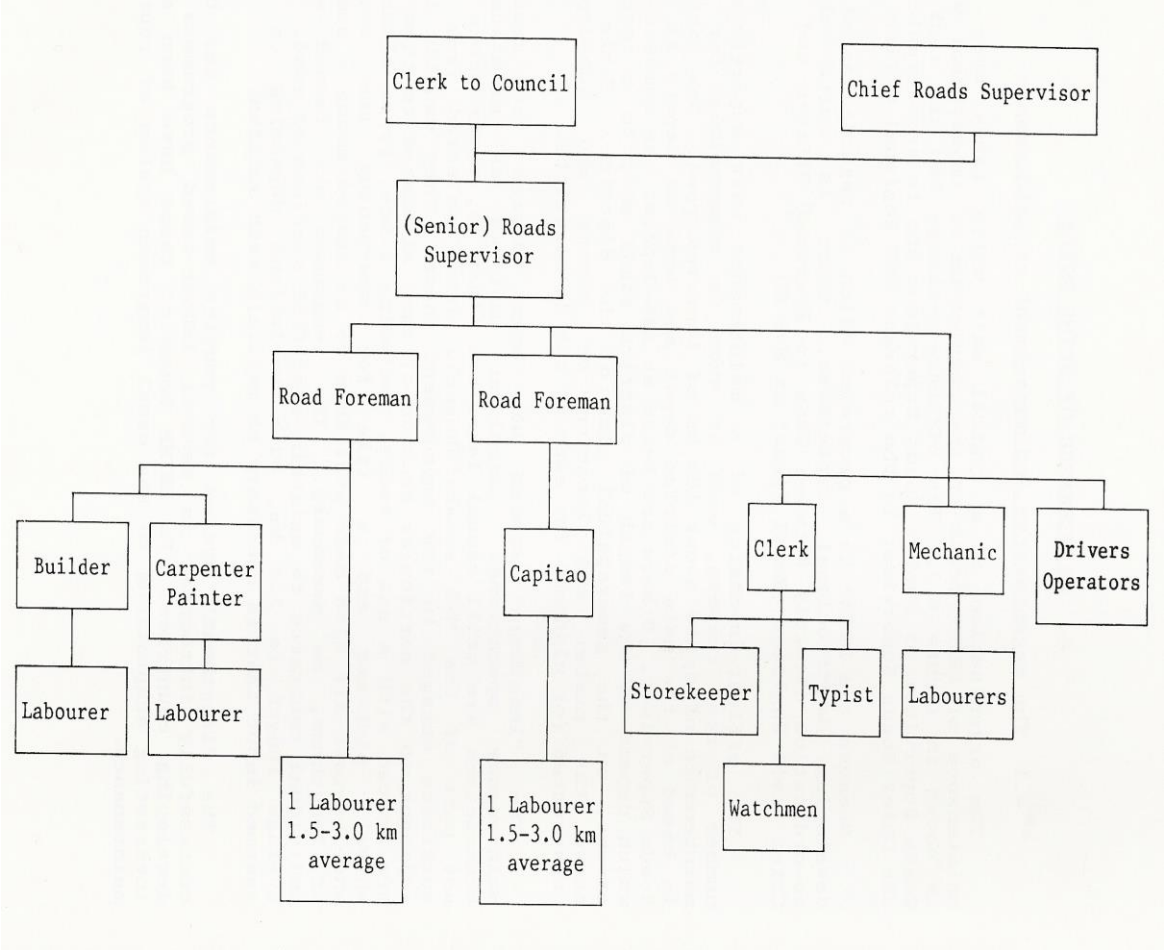


Figure 6.4: Typical organisational chart for DRIMP maintenance unit
Source: Hagen and Relf, 1988

The length-man system or contractor approach was used to carry out routine maintenance of the DRIMP roads under the Maintenance Unit; these were frequently selected from labourers who worked on the improvement programme.[9] As shown in Figure 6.4, each gang headed by a *capitao* reported directly to the road foreman who was responsible for up to 100 km of road maintenance under the direct supervision of the Senior Roads Engineer (Hagen and Relf, 1988). The latter was then accountable to the relevant Ministry of Works and Supply Regional Office. To improve efficiency of supervision, one foreman based at the main district depot acted as deputy to the Roads supervisor; whilst a reasonable number was stationed at sub-depots.[10]

According to Hagen and Relf (1988), adaptation of the usual length-man system was utilised for emergency repairs in the aftermath of heavy rains and damage to roadway and other

[9] Ibid, p45
[10] Ibid

structures: groups of casual labourers were contracted at flat rate to maintain and repair structures on a road network ranging from 5 – 10 kilometres. The adaptation worked very well, though it was supervision intensive and demanded a large number of foremen.

6.2.5 Achievements: Results, Outcomes and Impact on Poverty Alleviation

6.2.5.1 Achievements

In physical terms, achievements were as follows:[11]

- Length of road constructed and maintained – more than 5000 km
- Unit cost of 5.5 m road width (at 1985/86 prices) – MK 9219 or US$ 5273/km
- Number of people employed – 6 800 casual labourers
- Total cost going to labour – 38%
- Number of women employed (at improvement sites) – 50%
- Development of Road Training Manuals which have become the reference for all employment-intensive programmes and projects in Malawi. For example, MASAF, CRIMP and MRTTP manuals and technical specification all have been designed to conform to the DRIMP technical manual which, according to Johannessen (2000) and government officials, is the main reference and standard for all employment-intensive programmes in Malawi.
- Development of manpower for the programme was under the Ministry of Local Government. DRIMP District offices were established whereby training was offered by the Ministry of Transport. These offices continue to be used for providing labour-based works training for other programmes (Ngoma, 2003).
- Maximisation of local resources for programme implementation (Ibid).

[11] Ibid, p34; and Ngoma, I. 2003. Impact of Labour-based Technology on Poverty Alleviation in Malawi: Case of District Road Improvement and Maintenance Programme, Malawi Social Action Fund and MW/EU Public Works Programme; Proceedings of the 10th Regional Seminar for Labour-based Practitioners, Arusha, Tanzania. 13th – 17th October 2003.

6.2.6 Reasons for success

- Good planning and programme design.

- Time was devoted to developing institutional, administrative and technical capacities prior to programme implementation.

- Despite its focus on rural roads, the programme was treated seriously both in terms of technical and management points of view.

- Lead-in time for adequate training and development of human capital required to execute the project. In particular, emphasis was given to the training of foremen who were in critical demand for maintaining cost-effectiveness during programme expansion[12] In spite of threshold entry level of secondary school form five, foremen had to undergo 21months of relevant training to enable them execute their functions satisfactorily.

- Development of highly structured recording and reporting system to monitor performance and apply corrective adjustments where necessary.[13]

- Technical and financial efficiency developed.[14]

- Strong political support, financial commitment, and general commitment to succeed.

- District-based decentralisation ensured proper monitoring and evaluation, and instituting appropriate measures.

- Effective targeting by setting appropriate wage rates below market value, resulting in mass mobilisation of labour.[15]

---

[12] Hagen, S, and Relf, C, 1988. The district road improvement and maintenance programme: better roads and job creation in Malawi; ILO, Geneva and World Employment Programme.

[13] Ibid, p20
[14] Ibid 7
[15] Ibid

- Gradual expansion of the programme to other districts, taking cognisance of capacity needs and resources.

- The Programme benefited from the legacy left by the Youth Week, Self-help programme in that there was labour availability and willingness to work.

- Necessity of sustained local capacity resulted in general reliance on local human and material resources for execution of the programme. In addition, significant contributions were also received from expatriate engineers.[16]

6.2.7 Problems and Shortcomings

- At the beginning of the programme, future institutional responsibility for maintaining the improved district roads was not addressed.[17]

- Underestimation of scope of work, budget and time constraints resulted in serious overruns.[18] Accordingly, scope changes due to unforeseen and badly deteriorated roads translated into sharp variance in timeframes and costs compared to projections initially made. Consequently, expatriate engineers, assigned to the programme from the British government, had to make informed decisions in every district by conducting fresh road inventory surveys.

- Pressure on programme management capacity: initially one project manager was responsible for both improvement and maintenance operations. However as the number of districts increased together with other project control functions, uncoupling of improvement and maintenance functions became imperative resulting in the formation of two organisational entities.[19]

- Problem of lack of commitment to road maintenance and sustainability: Lack of adequate government financial support for further maintenance resulted in the project

[16] Ibid, p8
[17] Ibid, p9
[18] Hagen, S, and Relf, C, 1988. The district road improvement and maintenance programme: better roads and job creation in Malawi; ILO, Geneva and World Employment Programme.
[19] Ibid, p8

being abandoned, though lessons about standards were fed into new programmes. There was simply no policy to give strategic direction for road maintenance.[20] On the other hand, the lack of sustainability is attributed to centralised system of implementation whereby instead of decentralising to the District level, the programme was managed and controlled from the Ministry of Public Works.[21]

6.2.8 **Conclusions and Lessons**

- DRIMP demonstrated the technical feasibility and economic viability of constructing and maintaining high standard rural roads labour-intensively, with tangible socio-economic spin-offs.

- To re-iterate conclusions from a study undertaken by ILO, DRIMP was a highly successful programme and of significant benefit politically, socially and economically to Malawi.

- Adoption of a programme approach (spanning across more than a decade) gave programme stakeholders the required lead-in time for good preparation, training and development of local capacity.

- The programme succeeded in improving and maintaining roads labour-intensively at higher standards, whilst leaving a legacy of technical standard which has become a reference point for all employment-intensive programmes to-date.

- In particular, time was devoted to developing and setting up institutional, administrative and technical requirements for the programme.

- Training was extensive and relevant to programme needs.

[20] Personal Communication: Lwanda to Quainoo, 2007. Mr. A.O. Lwanda is the Programme Engineer for Malawi Rural Travel and Transport Programme (MRTTP), Lilongwe, Malawi.
[21] Personal Communication: Chagunda to Quainoo, 2007. Mr. J. Chagunda is the National Coordinator of Malawi Rural Travel and Transport Program, Lilongwe, Malawi.

6.3 The Malawian Social Action Fund (MASAF) In the 1990s

The winds of change in the late 1980s leading into the 1990s that blew across the global political landscape could not spare Malawi. The citizenry became more politically minded with a strong desire to participate in governance of the then one party-state. Therefore the Kamuzu government spent considerable time trying to defend its position. Consequently, there was insufficient funding budgeted for maintenance; general infrastructure deteriorated, and eventually the maintenance culture collapsed despite the availability of equipment and human capital.[22] With the change of government and the introduction of a multiparty state in 1994, events overtook them in terms of development, culminating in decentralisation policy and implementation. However, technical issues were unaffected: in each of District Assembly, there were in principle people with qualifications and experience for planning, design, implementation and management. But the problem encountered was that local authorities were reluctant to employ outsiders. Taking advantage of the polarisation within government structures, local authorities came up with MASAF – self-helped community-based programme which was divided into three phases.[23] Though politically motivated, the first phase – a three year programme – was implemented from 1995 to 1999; followed by phase two which was a depoliticised MASAF in 1999 until 2003 (a five year programme); then eventually Phase 3 from 2003 scheduled to end in 2015 (a twelve year programme).

Between 1991 and 1998, Malawi introduced the Road Maintenance Initiative to remedy the progressively deteriorating infrastructure. Several maintenance approaches were experimented, notably the Rural Accessibility and Mobility Activity (RAMPA).[24] It adopted an integrated approach to rural development whereby a needs assessment through a socio-economic survey was carried out to ascertain local conditions. One effect was targeting rural transport make schools and markets accessible to locals. Thus rural transport was targeted for development.

[22] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.
[23] Ibid.
[24] Personal Communication: Chagunda to Quainoo, 2007. Mr. J. Chagunda is the National Coordinator of Malawi Rural Travel and Transport Programme, Lilongwe, Malawi.

6.3.1 Objectives of MASAF at conception and implementation

In response to bad and worsening local conditions and anti-poverty initiatives, the MASAF programme was aimed essentially at school construction and rural accessibility to market centres and health facilities.

In MASAF 2 which lasted about five years (1999 to 2003), the objectives were to continue with what was done under phase one but with more decentralisation aimed at enhanced participation, improvement in procurement and technical standards of infrastructure.[25]

Specific objectives for the three phases of MASAF were as follows:

- MASAF Phase one aimed at contributing to poverty alleviation and employment creation via construction and maintenance of community infrastructure. An essential component of this integrated development was to develop capacity of all role players. Specific objectives of phase one were (Malawi Social Action Fund, 2005):

(i) To provide additional resources for programmes targeted at the poor, that is, fund the creation of village level assets, which would be directly beneficial to the poor through investments in primary education, peripheral health services and safe water.

(ii) To promote a new approach to rural development by involving communities in project preparation and implementation, while encouraging government agencies, NGOs and private institutions to assist communities when needed.

(iii) To support a district level programme of labour-intensive construction to be targeted at the poorest districts as a safety net operation.

(iv) To strengthen poverty monitoring and assessment systems through financing a Poverty Monitoring Support Facility.

Two types of infrastructure development were pursued (MASAF, 2005), namely (a) social infrastructure – construction and maintenance of primary schools, distance education centres, teachers' houses, water and sanitation, drainage systems in urban and semi-urban centres,

[25] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.

health centres and staff houses; and (b) economic infrastructure – including small-scale irrigation schemes, and village access.

- Under MASAF Phase two, specific objectives were as follows (MASAF, 2005):

(i) To provide additional resources and ensure sustainable use of resources targeted at the poor, vulnerable and marginalised groups through funding community level asset creation in education, health, water and other services;
(ii) To support safety net programmes through creation of temporary employment for the very poor and financing initiatives to assist the most vulnerable groups such as orphans, street children, persons with disabilities, the aged and those affected by Acquired Immune Deficiency Syndrome (AIDS), and
(iii) To enhance stakeholders' capacity to identify, prioritise, and implement projects through provision of training, technical assistance and funding of qualitative studies.

- The overarching aim of MASAF three is to improve service delivery by communities. Accordingly, MASAF three is divided into five parts: (i) Community Development Projects (CDPs); (ii) Social Support Projects (SSPs); (iii) Community Savings and Investment Promotion (COMSIP); (iv) Transparency and Accountability Promotion (TAP); and (v) Institutional Development.

6.3.2 Source and structure of programme finance: mechanisms for planning and allocation of resources

MASAF was financed by the International Development Agency (through the World Bank) and Government of Malawi. Funding for phases 1 and 2 were US$ 56 million and US466 million respectively; and phase two built upon the success of the former (Malawi Social Action Fund, 2005). During the third phase of MASAF which overlapped with phase two, there was widespread corruption amongst the ruling government officials. Disclosure then led World Bank to tighten anti-corruption measure which even affected MASAF. Adopting a

three-phased adaptable loan scheme, successive funds were made available only upon success of one project for better programmes.[26]

The first two phases of MASAF programme were completed between 1995 and 2003; while Phase three is still ongoing. Consequently, only Phases one and two will be discussed and analysed in detail.

6.3.3 Institutional Framework and delivery mechanism

Implemented through the creation of a Management Unit – a semi autonomous body under the Office of the President and Cabinet – both Phases one and two of MASAF were structured into components, each division responsible for a specific component of programme objectives.[27] Hence Phase One's divisions were: (1) Community Sub- Projects, which had about seventy-one (71) percent of the total budget, was to achieve the first two objectives of MASAF 1; (2) Public Works Programme, constituting about twenty-seven (27) percent of the US$ 56 million budget, was to meet the third objective of transfer of funds through labour-intensive programme; and (3) Poverty Monitoring Support Facility, which received two (2) percent for monitoring programme impact on poverty alleviation.

The Management Unit at the head office had zone offices which worked directly with district staff. In addition, a Project Steering Committee made up of key relevant ministries to the programme, a traditional chief, and independent members was appointed to provide policy direction while Community Project Committees were established to implement the sub-projects at community level.[28] Under the Sub-projects, communities actively participated in project identification, preparation and implementation assisted by government agencies, NGOs and private institutions.[29]

The Public Works, dubbed as the safety net Programme, contributed through the construction, maintenance and rehabilitation of economic infrastructure using labour

---

[26] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi

[27] Malawi Social Action Fund, MASAF, 2005. The People's Fund for Community Empowerment. Http://www.masaf.org Accessed: 20/05/ 2006.

[28] Ibid.

[29] Ibid.

intensive methods; projects included rural roads, small-scale irrigation schemes, afforestation and rainwater harvesting (Malawi Social Action Fund, 2005). The last component of MASAF one was managed under National Economic Council of Malawi.

Similar to the partition under phase one, MASAF two had three main components, namely: (i) Community Sub-Projects; (ii) Public Works Programme; and (iii) Sponsored Sub-projects supported by Finance and Administration directorates which were later merged under Internal Audit unit.[30] In addition, MASAF programmes were supported by the creation of units such as Information Technology, Communication and Training, Internal Audit and Technical Services.

MASAF's Management Unit operated through twelve zone offices, while the three main sub-programmes under MASAF two were managed as follows: (a) Public Works Programme by District Executive Committees; (b) Community Sub-Projects by Project Management Committees responsible for project development; and (c) Sponsored Sub-projects, by community based organisations or NGOs.[31] Project funds were allocated as follows: Community Sub-Projects Programme received 62.6%; Public Works Programme was allotted 20.6% (equivalent to US$ 13.28 million); while Sponsored Sub-projects Programme received 5.2% of the US$ 66 million programme funding (Malawi Social Action Fund, 2005). Additional funding of US$ 18.51 million was received from DFID, Emergency Drought Recovery Project and the Government of Malawi contributing 6.81% of the added money. This brought the total programme funding to US$ 84.51 million.

Four cardinal implementation principles were adopted under the MASAF programme (Ngoma, 2003).These were (i) all-inclusive community participation in decision making in the programme; (ii) formation of an independent community project management – selected by the community and charged with the responsibility of making decisions on all issues related to the projects; (iii) formulation of project management processes to foster accountability and transparency; and (iv) partnership between MASAF and relevant ministries, NGOs and other funding agencies with the purpose of improving the living conditions of the poor.

[30] Malawi Social Action Fund, MASAF, 2005. The People's Fund for Community Empowerment. Http://www.masaf.org Cited: May 20, 2006.

[31] Ibid.

MASAF 3 used a parallel system of force account and contracting. With exception of road pavement construction and building of schools, all road structures (namely bridges, culverts, and supply of cement, sand, stones and bricks) were delivered using contractors.[32] Under the Malawian contracting system in the programme, the contractor has a contractual arrangement with the District Assemblies but MASAF merely acts as a witness.

Wages: Though contractors were engaged, the system of payment was a force account approach. Each contractor was supplied construction materials and paid labour costs.[33] For a four-hour daily work, labourers received MK30 per day in 2003. By this arrangement, labourers were able to accomplish their scheduled daily task by 09h00 which enabled them attend to agricultural activities.[34]

The DRIMP standard road width of 10 metres was used for MASAF projects; additional one metre was allowed for drainage on each side of the roadway.[35] Because of corrupt practices and subsequent measures taken by World Bank, MASAF had to be restructured whereby Public Works were mandated to implement the road component of the programme. Accordingly, the Central Government authorised Public Works Department to do the planning of all roads including the rural road network[36] and implemented at decentralised structures. Under the new Department (that is, Public Works) in 2004, Central government was responsible for the main road network which was maintained by highly mechanised grading whereas district roads or D-road maintenance were carried out labour-intensively. One good aspect of the restructuring was that the labour wage rate was boosted from MK 30

---

[32] Ngoma, I. 2003. Impact of Labour-based Technology on Poverty Alleviation in Malawi: Case of District Road Improvement and Maintenance Programme, Malawi Social Action Fund and MW/EU Public Works Programme; Proceedings of the 10th Regional Seminar for Labour-based Practitioners, Arusha, Tanzania. 13th – 17th October 2003.

[33] Personal Communication: Ngoma to Quainoo, 2007. Dr. I. Ngoma is the Director of Malawi Transportation Technology Transfer Centre located within Department of Civil Engineering, The Polytechnic University of Malawi, Blantyre, Malawi.

[34] Personal Communication: Ngoma to Quainoo, 2007. Dr. I. Ngoma is the Director of Malawi Transportation Technology Transfer Centre located within Department of Civil Engineering, The Polytechnic University of Malawi, Blantyre, Malawi.

[35] Ibid.

[36] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K. M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.

(under MASAF) to approximately MK200, which was the highest in the Malawian labour market.

The Public Works Programme, another arm of MASAF which was EU funded, was conceptualised following the decentralisation policy and district poverty assessment in 2003. It was essentially an integrated development pilot project to the feeder roads programme through the local government. Under the pilot programme, lower tier roads and feeder roads were identified for funding in addition to other developments such as agricultural production, irrigation schemes, environmental issues and soil remediation to make it more productive.[37] Phase two of the EU Public Works Programme started in 2005 but no provision was made for maintenance in the budget proposal since EU considered it as Government of Malawi's responsibility.[38]

6.3.4 Achievements: Results, Outcomes and Impact on Poverty Alleviation

- Drawing on good practices promoted by the DRIMP, the MASAF programme was able to construct and maintain approximately 9 000 km of non-designated earth roads by the year 2001.[39]

- Greater percentage of the project budget went to the communities; approximately 38% of total road construction budget under MASAF 1, for example, went to labour; and created over 13 000 000 person-days of employment.

- Decentralisation ensured a high degree of women participation: over 50% of labourers employed were women, and simultaneously approximately 40% were in the Project Management Committee board.

---

[37] Personal Communication: Lwanda to Quainoo, 2007. Mr. A.O. Lwanda is the Programme Engineer for Malawi Rural Travel and Transport Programme (MRTTP), Lilongwe, Malawi.
[38] Ibid.
[39] Ngoma, I. 2003. Impact of Labour-based Technology on Poverty Alleviation in Malawi: Case of District Road Improvement and Maintenance Programme, Malawi Social Action Fund and MW/EU Public Works Programme; Proceedings of the 10th Regional Seminar for Labour-based Practitioners, Arusha, Tanzania. 13th – 17th October 2003.

- Between 197000 to 200 000 people were given direct employment, engaged only for 10 days per month at MK 200 daily wage.

- Grading was cheaper compared to hand shaping because of the higher daily wage of MK 200. Accordingly, cost per kilometre was 48 000 – 67 000 MK depending on geographical area and the terrain for doing it labour-intensively.

Tables 6.1 and 6.2 indicate the levels of success of MASAF 1 and MASAF 2 respectively.

Table 6.1: Achievements under MASAF 1 Programme

Community Sub-Projects (CSP) Programme				
Indicator	**Projected Target**	**Actual Achievement**	**Value, in Malawian Kwacha (MK) million**	**Percentage Achievement, %**
Educational Projects	***280***	***735***	***554.00***	***262.5***
•Number of classrooms		2,146		
•No. of school		735		
•No. of teachers' houses		854		
•No. of VIP latrines		4,478		
•No. of desks		56,445		
• No. of administration blocks		45		
Health Facilities	***80***	***56***	***64.50***	***70***
•No. of health centres		48		
•No. of under 5 clinics		8		
Water Projects	***320***	***477***	***262.00***	***149***
•No. of water kiosks	80	80		100
•No. of boreholes	921	921		100
•No. of Community Based Management trained	320	307		95.9
Other Economic infrastructure				
•No. of bridges	120	120	113.90	100
•No. of Community halls		5		
•No. of Postal agencies		8		
•No. of Project Management Committees trained		924		

Public Works Programme (PWP) (Employment-intensive component)				
Indicator	**Projected Target**	**Actual Achievement**	**Value, in Malawian Kwacha (MK) million**	**Percentage Achievement, %**
Roads		***395***	***436.00***	
•Kilometres of road constructed	4,563	5,063		111
•No. of bridges		252		
•Percentage of unskilled labour	36%	48%		133
•No. of people employed	167,201	188,000		112
•Person-days of employment created	12,096,000	13,600,634		112
•Total wage income transferred	MK252 mil	MK165 mil[40]		65.48
•Afforestation / Forests projects		60 (1,664 ha)	48.00	
•No. of trees planted		2.8 million		
•No. of irrigation projects		17	13.00	
•No. of community earth dams		17	7.40	

Source: Malawi Social Action Fund, MASAF, 2005.

[40] This is equivalent to 37.84% of total budget (that is, MK165 million / MK 436 million) for the labour-intensive road project under Public Works Programme.

Table 6.2: Achievements under MASAF 2 Programme (CSP & PWP only)

Community Sub-Projects (CSP) Programme				
Indicator	**Projected Target**	**Actual Achievement**	**Percentage Achievement, %**	**Comments**
•No. of community sub-projects	Not set	12,130		
•No. of community sub-projects funded	2,164	2,255	104	
•No. of projects completed	2,164	2,145	99.12	
•% of women participating in Project Management Committees	39%	38.1%	97.69	8.1% increase over MASAF 1 achievement
•% of women in Water Point Committees (WPCs)	50%	56%	112	Composition of women higher than men in WPCs
• No. of public & private sector persons trained in Community Sub-projects	2,900	614	21.17	Comprises village head persons, group village head persons & ward councillors
•% of infrastructure (schools, health centres, others) used, managed & maintained	100%	98.2%	98.2	
•% of Water Point Committees trained in Community Based Management for water facilities	100%	98%	98	
•No. of urban works / community sub-projects completed	100	93	93	

Public Works Programme (PWP) (Employment-intensive component)				
Indicator	**Projected Target**	**Actual Achievement**	**Percentage Achievement, %**	**Comments**
•No. of sub-projects request received	Not set	1,279		Based on requests from District Assemblies using Vulnerability Assessment Mapping
•No. of sub-projects funded •No. of sub-projects completed	286 382	382 374	134 97.9	
•No. of individuals that received at least 2 months wages (1998 – 2003)	720,000	535,676	74.4	Average duration of projects is 8- 9 months
•No. of women in receipt of wages for at least two months	100,000	244,274	244	
•No. of households benefiting from employment	80,000	119,039	149	
•% of women in PWP Project Management Committees	50%	25%	50	
•Share of subprojects costs for unskilled labour wages	40%	46%	115	
•No. of District Assembly Councillors orientated	300	302	101	
•No. of Assembly and sectoral staff orientated (senior staff)		107		
Total number of people trained at sub-project level •District level •Project Level	***3,400***	***3,508*** 444 3,164	***103***	 District =405, cashiers =39 Foremen=452, Project Management Committees = 2,712

Source: Malawi Social Action Fund, MASAF, 2005.

6.3.5 Reasons for success

MASAF programmes were very successful; projected outcomes were generally exceeded in real terms, indicative of the degree of dedication. Reasons behind the success may be due to the following:

- Programme objectives were clearly stated, and well-thought components were created to achieve them. For example, MASAF created components such as the Public Works Programme and Community Sub-projects programme, each to meet specific objectives.

- Adequate preparation in terms of institutional set up, capacity building, technical, organisation, administration and control systems was done to carry out the programme. For example, amongst other good practices, necessary work plans were developed for the Community Sub-Projects and the Public Works Programme (the labour-intensive component of MASAF 1) (World Bank, 1996b).

- Programmes were treated like any serious mega industrial infrastructural projects in relation to planning, technical and project management.

- Training was adequate, relevant to the project operations, and was preceded by development of comprehensive training manuals.[41] Establishment of a training unit (together with a technical service unit) enabled the orientation and training of the programme staff including District Assemblies, community councillors, project management committees, and water point committees with a satisfactory degree of women representation.

- Capacity enhancement studies culminated in institutional strengthening – through training and technical support – of the Management Unit (responsible for programme implementation), and other stakeholders at national, district and community levels under MASAF 2 (World Bank, 1998).

[41] Ibid. p74-75

- Promotion of active participation of beneficiaries through project identification, preparation and implementation at both urban, rural, and community levels. The World Bank considered community empowerment and capacity building to be major achievements of MASAF1. Amongst other things, programme participants were trained in planning, budgeting, procurement, accounting, supervision and management.

- Scheduled programme indicators of success were formulated to strengthen specific objectives together with frequency of monitoring them and means of verification;[42] thus making it easier to monitor and evaluate.

- Programme planning, design and technical specification were generally good and drew extensively on experience from DRIMP.

- Ownership by Local authorities and Districts. Resources to fund the projects were obtained from local development fund.[43]

- Special poverty monitoring component was created under both MASAF 1 and 2. This provided analytical skills for the Government of Malawi for tracking progress on poverty reduction (World Bank, 1998).

- In relation to the EU funded Public Works Programme, the main strengths are[44]:
    (i) Integration of works through the integrated development approach which is a catalyst to rural development.
    (ii) Government decentralisation policy supported the programme. There was proper control over project results, as well as community support and ownership of the project and its maintenance.

[42] Ibid. p73
[43] Personal Communication: Kumwenda to Quainoo, 2007. Mr. H. Kumwenda is the Planning Engineer at the Ministry of Local Government and Development, Lilongwe, Malawi.
[44] Personal Communication: Lwanda to Quainoo, 2007. Mr.A.O. Lwanda is the Programme Engineer for Malawi Rural Travel and Transport Programme (MRTTP), Lilongwe, Malawi.

(iii) Remuneration was tied to labour productivity. In addition, 100% bonus for completed maintenance work was given as an incentive.

(iv) Proper monitoring and evaluation was done.

6.3.6 Problems and Shortcomings

Both MASAF 1 and 2 were highly successful, achievements in many instances exceeded intended targets. However, there were certain difficulties and inadequacies that should be guarded against for enhanced outcomes in future programmes. World Bank (1998) document on MASAF 2 Programme highlighted the following problems and issues under the first programme:

- Disbursement of funds from Bank was onerous due to the creation of many small special accounts. The problem was compounded by insufficient flow of funds resulting in late payments, and time overruns. On the average, projects scheduled for eight to nine months duration were generally about fifty (50) percent behind schedule.

- MASAF's rapid expansion incurred performance and management challenges. Influx of new programme staff had to be catered for through on-going management and staff training programmes. World Bank recommended that MASAF's growth should be matched by its management and project delivery capacity in addition to the need for improvement in field operations, training facilities and project quality control measures.

- Decentralisation was not supported with sufficient internal programme control. For example, because of lack of accountability at District level, the labour-intensive component of MASAF (Public Works Programme) encountered several problems (World Bank, 2003).

- Bookkeeping manuals developed for training support staff were too complicated so a simplified version for the training programme was recommended.

- Excessive rate of external auditing. This caused unnecessary disruptions of project work. It was recommended that audit frequency be reduced to two times a year.

- Contractors were not sufficiently briefed about MASAF goals and objectives during the initial stages of the programme. Therefore, one recommendation emanating from a review of the Public Works component of MASAF was that community representatives, contractors and foremen must be orientated at the beginning of the programme.

- Political in-fighting due to polarised views about corruption affected infrastructure construction and maintenance on the ground. Consequently, Public Works had to take charge of the programme. One problem was how to manage the interface of change in order to continue with the vision, aims and objectives of MASAF. This highlights the importance of comprehensive programme monitoring and control mechanism, not limited only to quality of infrastructure constructed and maintained, but in addition to cost management as well.

- Proliferation of donors and the problem of non-conformity to programme standards. For instance, EU entered the programme with its own standards with some contracts given to NGOs without consulting appropriate government institutions. In addition, EU-funded programmes set its daily remuneration at MK 200, well above the government stipulated minimum wage under MASAF which was MK 43, whilst others like Action Hunger pegged its daily wage at MK 100. The effect was to distort the labour market and the programme.[45]

- Bad practice of involving communities beyond their capacity. In some instances, the final product was defective. For example, for some road construction and maintenance compaction was not effected using any

[45] Personal Communication: Kumwenda to Quainoo, 2007. Mr. H. Kumwenda is the Planning Engineer at the Ministry of Local Government and Development, Lilongwe, Malawi.

equipment.[46] This underscores the importance of adequate training of all programme participants.

- MASAF opened up roads everywhere but neglected maintenance after the second or third years.[47] EU failed to fund maintenance of the Public Works Programme. As a result, all contracts were stopped; though negotiations were opened nothing happened on the ground. Road conditions deteriorated with extreme dissatisfaction expressed by the local inhabitants.[48]

- Element of progression not duly considered in the Public Works Programme; this had a negative impact on sustainability of manpower developed. The lack of continuity of work or too short duration of projects, often triggered by resource constraints, resulted in loss of knowledge; and participants had to be retrained which also impacts on total programme costs.[49]

- Lack of proper communication management structures under the EU-funded Public Works Programme resulted in EU-appointed foreign consultants having the upper hand in the initial first phase of the programme over local consultants. This was corrected in the second phase of the programme through localisation.[50]

An independent review by the Operations Evaluation Department, OED, (2005) of the World Bank also identified lack of continuity in public sector leadership as a hurdle in the endeavour to build Malawi's capacity. According to OED, the Malawi system of rotating political and civil service management, and trained staff critical to outcome of the programme between ministries, often with little pre-information, posed a serious risk to long term capacity building and successful implementation of projects.

---

[46] Ibid.
[47] Personal Communication: Mwale to Quainoo, 2007. Mr. M.K.M. Mwale is the Deputy Director of Roads, Ministry of Transport, Public Works and Housing, Lilongwe, Malawi.
[48] Personal Communication: Lwanda to Quainoo, 2007. Mr.A.O. Lwanda is the Programme Engineer for Malawi Rural Travel and Transport Programme (MRTTP), Lilongwe, Malawi.
[49] Ibid.
[50] Ibid.

6.3.7 Lessons and Conclusions

- The high degree of success achieved by both MASAF 1 and 2 indicates that given sufficient funding, and good lead-in time for thorough planning and preparation, it is possible to successfully implement employment-intensive programmes and make a significant impact on poverty reduction.

- Decentralisation of labour-intensive programmes fosters ownership and helps to achieve developmental objectives or long term goals.

- Adequate resources are required to make labour-intensive programmes a success in attainment of both immediate and developmental objectives.

- Community leaders, politicians, programme staff and implementers (including contractors and foremen) should be orientated at the beginning of the programme. This eliminates unnecessary delays.

Other lessons learned and reported by MASAF (2005) emphasized the following points, among others:

(i) Importance of de-politicising implementation of development programmes with minimal or no political interference.
(ii) Infrastructure development has significant impact on poverty reduction only when translated into economic development.
(iii) Commitment, transparency (with regard to resource allocation system, for instance) and accountability are essential components of a successful programme.
(iv) Provision of basic and clear project management, financial management and leadership skills even to communities with low literacy levels can significantly influence programme outcomes.
(v) Challenges of decentralisation are surmountable provided locals responsible for planning and implementation are supported through improvement in capacity.

(vi) To be self-targeting in terms of reaching the poor, wage rates should be set below prevailing market value.

(vii) For timely conflict management, systems for channelling grievances must be made available at all levels of programme implementation up to district, local and community level.

The foregoing discussion and analyses of the Malawian employment-intensive experiences show that the first programme, DRIMP, was successful primarily because of political support, commitment to use labour-intensive construction technology and financial support received from donors. In particular, the adoption of a programme approach to reduce poverty through basic infrastructure provision enabled good preparation, in terms of clarifying institutional, administrative and technical issues of the programme, and extensive training and capacity development to take place. On the other hand, DRIMP's collapse, after almost 15 years of successful implementation, was mainly attributed to lack of adequate government financial support for the road improvement and maintenance activities.

The second interventions, the MASAF programmes, were also very successful because they drew extensively on the experience and good practices from DRIMP. However, MASAF's later expansion and decentralisation encountered problems owing to insufficient cash flow and lack of commensurate management capacity to control the programme.

CHAPTER 7: CASE STUDY 5: LABOUR INTENSIVE ROAD CONSTRUCTION PROGRAMMES IN LESOTHO SINCE 1970s: ACHIVEMENTS, PROBLEMS AND SHORTCOMINGS

7.1 Background

Lesotho is a mountainous land mass, landlocked like Malawi and Botswana, with formidable developmental challenges and a total road network of more than 5 000 km (African Development Fund, 2000:9-11) in 15 districts . Ministry of Works and Municipal Authorities shared joint ownership and responsibilities for the country's road network.[1] Under the former ministry, responsibilities were devolved as follows (African Development Bank, 2000:11; World Bank, 2004b:2):

- The Roads Branch has responsibility for all classified gazetted roads. In particular, this branch is charged with the development and management (traffic control and maintenance inclusive) of all primary and secondary roads;

- The Lesotho Labour Construction Unit (LCU) is responsible for upgrading over 2000 km of rural earth roads to engineering standards, as well as their maintenance and regravelling using labour-based methods;

- The Civil Works Section (CWS) caters for the construction and maintenance of over 1500 km of local earth roads, tracks and footbridges to a lower standard than LCU roads using labour-based methods. CWS labourers were paid both in cash and in kind, supported by World Food Programme, Government of Lesotho, Government of Japan and European Union Community (World Bank, 2002: ToF p17).

Similar to prevailing socio-economic conditions in other Sub-Saharan African countries that implemented employment-intensive road construction programmes in the 1970s and 1980s, the Government of Lesotho recognised the poor road network and lack of accessibility to major centres as serious drawbacks to rural development of communities who lived on the

[1] Personal Communication: Ntoi to Quainoo, 2007. Mr M. Ntoi is a Civil Engineer working for LCU.

peripheral of the economy. South African mines used to absorb about forty (40) percent of Lesotho labour force as migrant labourers (Pama, 1999:151). However, the global recession in the 1970s was followed by mass retrenchments in South African mines which brought unprecedented hardships to many Basotho who depended on remittances[2] from relatives working in the aforementioned industry. According to African Development Bank (2000:9), remittances aggregated to about sixty-seven (67) percent of Lesotho's GDP in 1990 and thirty-three (33) percent in 1996. Unemployment[3] estimated at more than thirty-four (34) percent was worsening by an annual increase of nearly six (6) percent (Pama, 1999:151). Higher economic growth rates between the 1980s and 1990s did not translate into commensurate growth in employment (United Nations, 2007:5). In addition, the unemployment-poverty dilemma exacerbated the weak employment creation policies (Kingdom of Lesotho, 2000:10). Therefore to ease unemployment and poverty, and kick-start the rural economy, the Government of Lesotho identified feeder roads upgrading and construction, and maintenance of airstrips, as a precursor to improving the quality of life of the populace.[4] Hence the birth of the Lesotho Labour Construction Unit (LCU), established with the overarching objective of rural road construction and unemployment reduction.

Programme implementation was effected using the force account system until early 1990s when a contracting approach alongside some elements of the former was eventually adopted.[5] At the initial stages, in 1977, LCU experienced institutional problems and lack of legitimacy before its final establishment as a de facto government department under the Ministry of Works (MOW), Road Department. Reformulation in 1989 resulted in LCU given the responsibility of 2 500 km of feeder roads to upgrade and maintain (Marshall, 1990:10). Up to 1992, the LCU constructed 2200 km of road, and created over 23 000 person –years of employment (McCutcheon, 1989c:56). By 2000, LCU had merged with the Civil Works

[2] According to SIDA evaluation 97/5 conducted by Stiedl, et al in 1997, aggregate annual remittance was greater than or equal to Lesotho's GDP.

[3] According to World Bank 2006 report, unemployment is persistently high at approximately 35% (World Bank. 2006. Lesotho Road Rehabilitation and Maintenance Project. Project Performance Assessment Report (Credit 2857-LSO); Report No: 35049-LS; January 25, 2006.Sector, Thematic, and Global Evaluation Division, Independent Evaluation Group. Washington, D.C., p1)

[4] Personal Communications: Ntoi and Jennings to Quainoo, 2007. Mr. M. Ntoi is an LCU Engineer in Maseru, Lesotho, whereas Mr. D. Jennings is Programme Director for IT Transport, Oxford, UK.

[5] Ibid

Section (CWS) and was rebranded as the Department of Rural Roads, DRR.[6] In addition, the government of Lesotho adopted a long-term labour-intensive road construction plan (20 years) to service 2000 km of road by the year 2010.

In general, achievements have been significant despite the financial constraints, capacity limitations and other problems. The succeeding sections describe and discuss two major phases of the Labour Construction Unit, namely; (i) the force account system between 1977 and 1992, and (ii) the contracting approach to labour intensive road construction since 1993. Programme achievements and contributory factors, as well as problems and challenges, and lessons learned that should form a basis for developing a sustainable employment-intensive programme in South Africa, are reported below.

7.2 Pre-1993 Lesotho Labour Construction Unit and the force account system

Following World Bank recommendations, supported by ILO and UNDP, to seek innovative ways of public infrastructure provision that could offer employment opportunities for retrenched Basotho mine-workers from South Africa, the LCU was established as a pilot programme in 1977 (Stiedl et al, 1997:9). The aim was to investigate the potential of labour-intensive construction technology and its potential benefits under the World Bank Second Highway Project in the country. The three year pilot programme was largely successful, and nationwide replication started in 1980; the target was to offer employment to at least 3 500 people by 1985 (Ibid: 4; Edmond, undated:2). However, the Government's action-packed plans could not be fully realised as projects undertaken depended on availability of funds which were scarce (Ibid, p2).

7.2.1 Objectives at conception and implementation

The initial two-pronged goals may be summarised as follows (Stiedl et al, 1997:10):

(i) to promote and expand the efficient use of labour-intensive methods for public works in Lesotho; and

[6] Ibid; Kingdom of Lesotho, 2000. Interim Poverty Reduction Strategy Paper. Ministry of Development Planning, Maseru. December 2000, p10

(ii) to generate and maximise gainful employment opportunities with primary focus on migrant workers.

To achieve the above goals, four-fold objectives were formulated,[7] namely:

(a) to prove the technical viability and financial feasibility of labour-based methods;
(b) to formulate procedures for large-scale implementation of labour-based techniques;
(c) to train supervisory staff for the programme; and
(d) to provide all-weather access roads linking rural areas to cities and major towns.

7.2.2 Scope of work

In order to achieve the stated objectives, programme inputs involved the following works:

(i) upgrading and maintenance of 2 500 km of feeder roads, together with
(ii) additional responsibilities assigned in 1997 (Pama, 1999:153).

These were construction and maintenance of part of the Lesotho Highlands Revenue Funded roads Projects and maintenance of Lesotho Highlands Authority Feeder Roads Project around the dam for the water supply project.[8]

[7] Stiedl et al. 1997. Labour Construction Unit, LCU, Lesotho: 19977-1996; SIDA Evaluation 97/5; Department for Infrastructure and Economic Corporation.; p10.

[8] Personal Communication: Ntoi to Quainoo, 2007. Mr M. Ntoi is an LCU Civil Engineer.

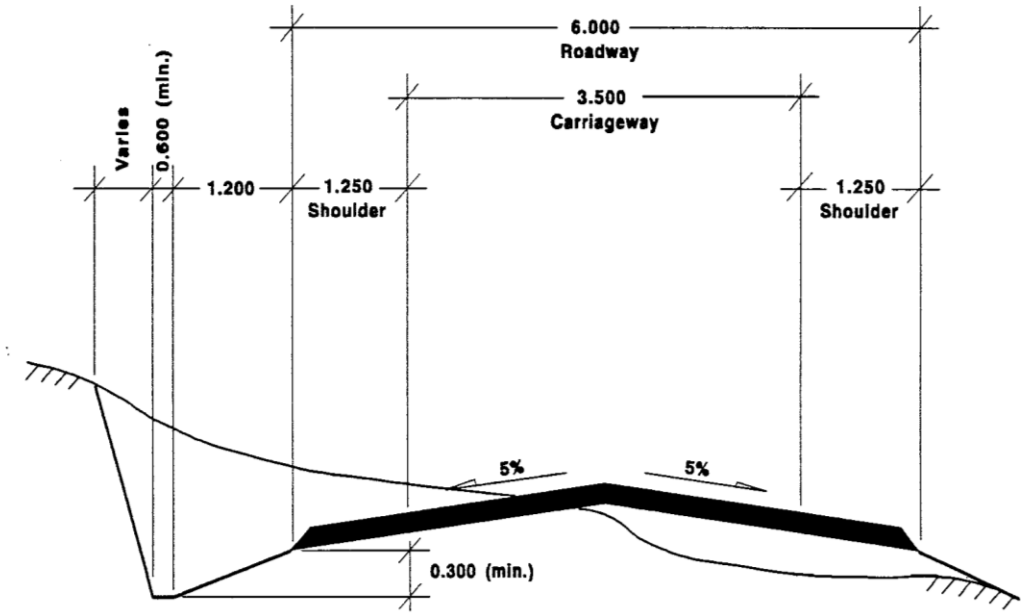


Figure 7.1: Standard cross section of low-volume road in lowland/rolling terrain
Source: CTP 129, 1992

The standard of construction, informed by the Berger Study in 1996 (Marshall, 1990:13), should be internationally comparable as shown schematically in Figure 7.1. Specific operations included road upgrading and maintenance; vertical alignments; drainage systems construction and erosion control checks; and use of local materials (Marshall, 1990:61-71). In addition, technical specification manuals were developed for field work and supervision (Ibid, p74).

A prior road inventory (and condition assessment) study carried out (on the then over 2100 km of LCU designated roads) by Louis Berger in 1986, and pre-1986 road *trafficability* study undertaken by D. Stiedl (Marshall, 1990:13) indicated the developmental challenges captured in Table 7.1.

Table 7.1: LCU road inventory and nature of landscape

Nature of Road/Terrain	Kilometres of Road	Proportion of Road Network, per cent
Length in maintainable condition	483	20
Length requiring upgrading to maintainable standards	716	35
Length in poor condition requiring full construction	936	45
Network lying in flat terrain	> 500	25
Network in foothills	> 600	30
Network in mountainous areas with steep slopes	> 900	45

Source: Marshall, 1990

Equally important for rural development decision making, the Berger Study prioritised the entire road network according to their development potential and economic importance for construction, upgrading and maintenance (Ibid, p14). Production rates were pre-planned in worker-days per kilometre for each terrain type; in effect, an initial government funding of M1.8 million was allocated for routine maintenance (Ibid, p19).

7.2.3 Source and structure of programme finance: mechanisms for planning and allocation of resources

The World Bank, Swedish International Development Agency (SIDA) and German counterpart (KfW) have been the major financiers of the LCU programmes. The World Bank funded pilot project received technical support from ILO funded by SIDA (Stiedl et al, 1997:9). For example, in 1978, LCU was financially supported to the amount of SEK 105 million (equivalent to approximately US$14.9 million). Other donors made significant financial contributions to the implementation of the LCU programme. The government funded the technical assistance during 1980 – 1981 periods, an indicative of government's commitment, when World Bank support ended. SIDA continued to fund specific projects until, after Lesotho government's request, it accepted full responsibility of funding the technical assistance relating to core support and institutional building (Stiedl et al, 1997:9) rendered by ILO in 1982. Eventually when SIDA support was discontinued in 1997, the

World Bank returned as a major financial supporter of programme. Though an essential success factor, donor funding should be viewed by recipient governments as incentives rather than drivers of the programme. This calls for greater political commitment, local financial support, and reliable and adequate sources of funding.

7.2.4 Implementation Strategy and programme delivery[9]

Established as a legitimate body under the Ministry of Works in the 1980s, LCU's decision-making regarding scope of work, standard of construction were made by the Government of \ Lesotho in conjunction with Ministry of Works. In-house capacity developed during the pilot phase was used to execute the programme. Four main stakeholders attached to the programme were the Government of Lesotho (who provided policy direction and partial funding); rural communities of Lesotho (responsible for labour supply); international development agencies (such as the World Bank, SIDA and KfW) which provided much of the needed finance; and International Labour Organisation (ILO, which assumed responsibility for training).

According to Marshall (1990:28) the 1990 conditions of employment and wage rates in relation to the 20-year long term programme adopted, dictated that resource requirements entailed a planned number of field supervisors; casual labourers; limited construction equipment (such as tipper trucks and pedestrian rollers); and vehicles for supervisory staff. Daily wage for casual labour was M10.40 whereas Technical Assistants for field supervision were paid approximately M417 per month (Ibid, p43).[10] This force-account system served the programme well until 1993 when decision was made to abolish it.

7.2.4.1 Training programme

Intrinsic to the LCU programme was a training component for staff and other stakeholders which was well-structured and relevant to the needs on the ground, though not without initial problems during the expansion phase. Similar to what happened in Kenya, a training centre was constructed only after over a decade into the programme (Stiedl et al, 1997:4). At the

[9] Personal Communication: Ntoi to Quainoo, 2007. Mr M. Ntoi is an LCU Civil Engineer.
[10] In 1990, 1US$ ≈ M 3.4 (African Development Fund, 2000)

early phases of the programme, the Labour Intensive Training Unit (LITU) was charged with the responsibility of training participants and had an over-ambitious aim of providing training in labour-intensive methods to all line ministries; performance was unsatisfactory partly due to unstructured nature of the training programme and insufficient resources resulting in inadequate staff training (Stiedl et al, 1997:4). Accordingly, efforts to remedy the situation by the appointment of a training advisor in 1983 had negligible impact.

SIDA proposal in the 1990s culminated in the establishment of a training centre for the training needs of the programme (Stiedl, et al, 1997:4-5). Prerequisites by SIDA included (i) training policy formulation; (ii) availability and timely disbursement of financial support; (iii) training needs establishment; (iv) technical specification of training; (v) incentives (for example, potential career advancement and or improvement in earning capacity plans) and (vi) follow-up mechanism plan to help improve results.

7.2.5 Achievements: Results, Outcomes and Impact

The LCU pilot programme demonstrated that labour-based road construction techniques were technically feasible and economically efficient, giving the Government the motivation to expand the scope of application (Edmonds, undated: 1). High standards of road construction were achieved despite the difficult terrain. Table 7.2 captures the output with respect to type of landscape.

Table 7.2: LCU Construction costs and outputs for gravel roads

Terrain type	**Labour input (person-days /km)**	**Cost (M) /km @ 1995 prices**
Flat / rolling landscape	1400 – 3 200	9 000 – 175 000
Hilly / Mountainous areas	3 200 – 4 400	170 000 – 190 000

Source: Stiedl et al, 1997:24

The comparably high unit cost of kilometre of road constructed and or upgraded in relation to results from other countries is probably due to the unfavourable terrain. According to Stiedl et al, (1997:24), other cost drivers are the number of drainage structures constructed –

bridges, vented fords, drifts and culverts – gravel haulage distance; and the know-how and efficiency of work foremen and site inspectors for the planning and site organisation.

Comparative analysis carried out in 1995 indicated that the conventional method of construction in Lesotho was thirty-seven (37) percent more expensive than employment-intensive construction notwithstanding the high daily wage rate of US$ 4.90 (Tajgman and de Veen, 1998: 15; Majeres and de Veen, 2001:8).

Notable programme achievements include, inter alia, the following:[11]

(i) Development of policy and institutional set-up for integrated rural development and employment generation;

(ii) Financial competitiveness and consistency of engineered earth and gravel roads with conventional methods of construction. In general, labour-based construction techniques were 25 – 35% cheaper (Edmond, undated:7);

(iii) Increase in labour-intensity from 40% to 44%[12] between 1985 and 1997 compared with just 6% for (contractor) equipment-based methods; this compares favourably with the Kenyan Rural Access Programme figure of 47% (Ibid). Figure 7.2 depicts person-years of employment generated during the programme between 1977 and 1998 (McCutcheon, 1989c:56). As at 2002, wages and salaries accounted for approximately 60% of total project cost (World Bank, 2002: STOF: 17). At a daily wage rate of approximately US$ 2.80 between 1977 and 1980, employment by LCU rose from 700 to an annual average of 1020 in 1985 (Edmond, undated:3);

(iv) Comparatively higher productivity in general, ranging between 1528 and 6780 person-days per kilometre of road which translated into cost of M6760 / km to R7456 / km depending on nature of work, type of terrain (which was mainly mountainous) and wage rate (Ibid:5). By 1983, productivity averaged at 2793

[11] Stiedl, D; Danielsson, T; and Sahle, D. 1997. Labour Construction Unit, LCU, Lesotho: 19977-1996; SIDA Evaluation 97/5; Department for Infrastructure and Economic Corporation.; p3.
[12] At the peak of the programme, it employed approximately 2000 – 2500 labourers (equivalent to about 23 000 worker-years) (Ibid: p28).

person-days per kilometre at a cost between M7 257 and M43 500 (Ibid). Work studies indicated that some imported tools from South Africa fell short of standard required; in addition, use of donkey-carts for haulage (which worked well in Botswana) had difficulties due to the undulating landscape (Ibid:14). Thus, the development of country-specific technical specifications and manuals (through adaptations or otherwise) tailored to suit local conditions and constraints is of paramount importance.

(v) National acceptance and international recognition for its contribution in the field of labour-intensive construction;[13] and

(vi) Twenty years of successful force-account operation (Bentall, 1999:28), is indicative of the viability of the system under certain conditions. Given the self-induced problems inherent in the contracting such as insufficient contract management by client and delayed and irregular payments, the LCU experience with a carefully engineered force-account system could be beneficial if run alongside contracting. The World Bank, however, deems force-account for road maintenance unsustainable (World Bank, 2004b).

[13] Ibid: p18; and Personal Communication: Ntoi to Quainoo, 2007. Mr. M. Ntoi is an LCU Civil Engineer, Maseru, Lesotho.

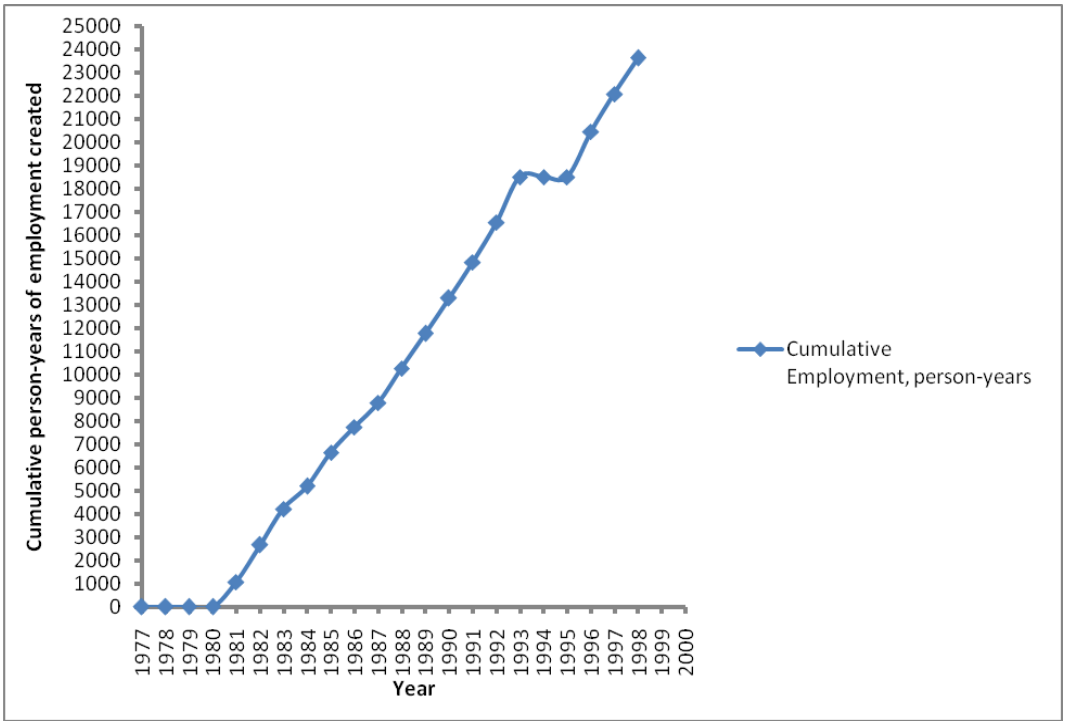


Figure 7.2: LCU employment generated between 1977– 1989 and projected to1998 (Source: Adapted from McCutcheon 1989c)

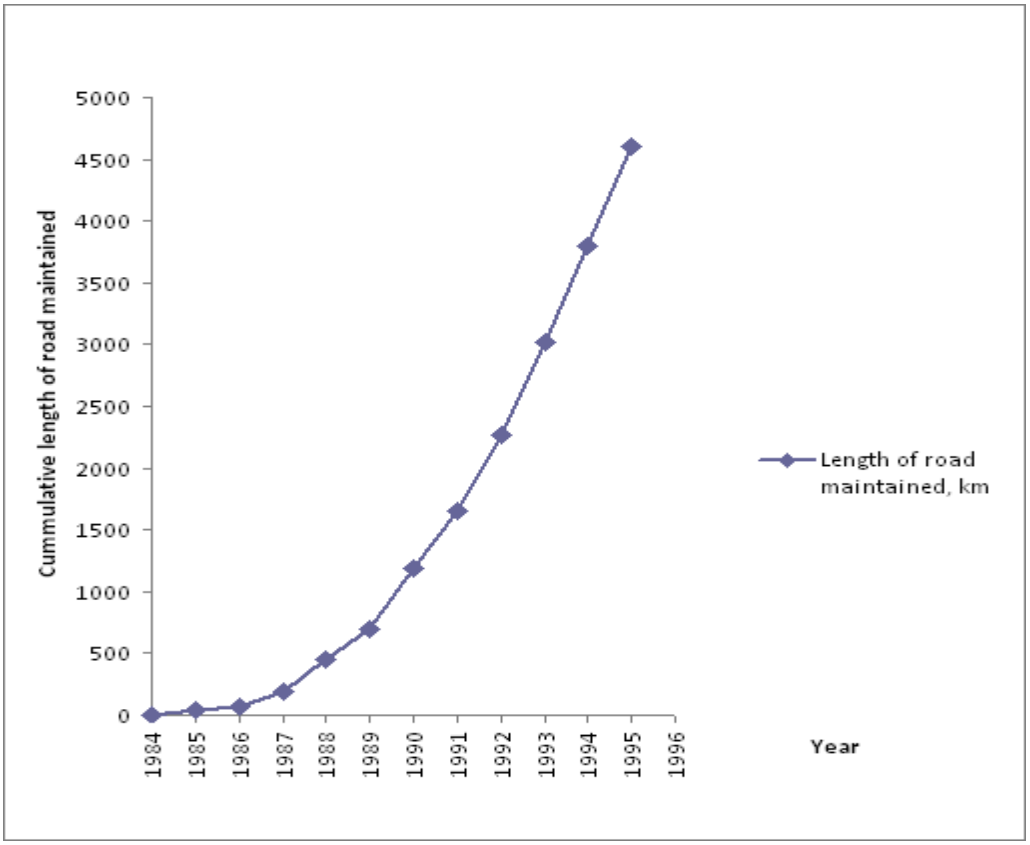


Figure 7.3: LCU Routine Maintenance Length of road (km) maintained

Source: Adapted from SIDA, 1997

7.2.5.1 Interpretation of achievements

Success of the programme could be attributed to a number of complementary factors. Among these are the following:[14]

(a) LCU received strong commitment in terms of political support and adequate resources from both government and donors;

(b) Early investment in research and training culminating in a well-trained manpower;

(c) Use of local labour and technical skills to produce technically sound and cost-effective road network even under difficult terrain;

(d) Adoption of a long-term (20 year) plan for the labour-intensive programme;

(e) The establishment of a training centre in the 1990s for the training of programme staff, and later contractors;

(f) Good balance between number of casual labourers and programme staff (a ratio of about 6:1) indicative of close or adequate supervision (as shown in Figure 7.4);

[14] Ibid: pp 2-3, 10

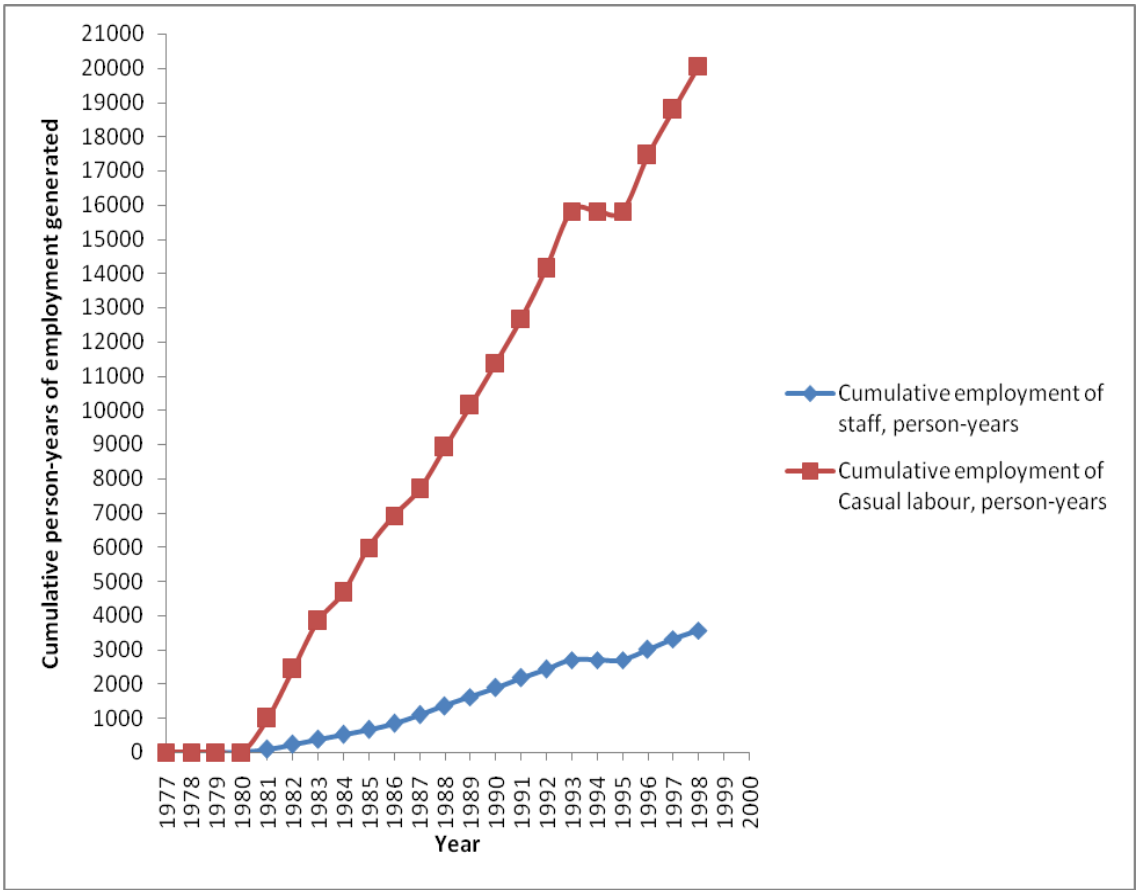


Figure 7.4: Person-years of programme staff and labour created from 1977 – 1989 and projected to 1998
Source: Adapted from McCutcheon 1989c

(g) Adequate lead-in time to establish institutional arrangements, embark upon sufficient planning, develop relevant training material and train relevant programme participants. This explains the reason why there was slow progress in the first years as shown by Figures 7.3 and 7.4, a significant and necessary phenomenon for success which should be internalised by all programme stakeholders. Fast-tracking this process can only guarantee later problems and waste of resources;

(h) Positive impact on standard of living of the rural populace, though difficult to quantify.[15] Equally important, SIDA evaluation also suggested that for effective impact on rural economy development, road construction must be

[15] Stiedl, D; Danielsson, T; and Sahle, D. 1997. Labour Construction Unit, LCU, Lesotho: 19977-1996; SIDA Evaluation 97/5; Department for Infrastructure and Economic Corporation.; p5

integrated with other complementary developments with potential high rate of returns.[16]

7.2.6 Problems and Shortcomings of the LCU force account programme

Despite harsh realities and successful demonstration that the force account system may arguably work under certain circumstances, full achievements were diluted by a number of deficiencies which would require serious attention for future similar programmes. Noteworthy issues for improvement in future programme design and performance include the following:

(i) Lack of adequate and readily available funding and the cumulative effect on unemployment – though substantial compared with other employment-generation activities in Lesotho, the labour-intensity achieved was less than could have been achieved with full government support;[17]

(ii) Insufficient due consideration of the economic aspects of the programme delivery approach (Stiedl, Danielsson and Sahle, 1997:6);

(iii) Lack of clarity in government policy and commitment for programme expansion after the successful pilot phase in 1980 (Ibid:15). For example, in spite of the successful practical training conducted, the theoretical component – underpinning for solving problems from first principles – was largely reduced because of political pressure to deliver (Edmond, undated:9);

(iv) Initial institutionalisation problem coupled with lack of recognition (Marshall, 1990:8-9; Edmond, undated:12). In particular, lines of reporting were ill-defined and the LCU had no permanent status within government; without assured source of funding, the unit had to depend on individual projects on an ad hoc basis and short-term planning horizons which were largely unsustainable. SIDA's conditional financial support in the 1980s for future projects in Lesotho as well as Ministry of Works' unilateral but pragmatic

[16] Ibid, p6
[17] Ibid.

steps helped institutionalise and establish LCU as a legitimate government unit (Marshall, 1990:9-10). Accordingly, SIDA funds would be released upon the following conditions: *(a) a firm policy decision by GOL on labour-based methods accompanied by a strategy for policy implementation; (b) a decision pertaining to responsibility for the construction and maintenance of minor roads; (c) a decision to establish a long-term labour-based programme for rural minor roads; and (d) measures taken by GOL to ensure adequate engineering training and strategy for staff retention.* Satisfactory results followed the SIDA stipulated conditions; the Ministry of Works in conjunction with Ministry of Planning for Economic and Manpower Development produced a far-reaching policy statement on the use of labour-based construction methods for Lesotho roads (Marshall, 1990:9-10). Among the immediate outcomes were (1) establishment of Lesotho Roads Authority with clear role definitions;[18] (2) unilateral transfer of responsibility for upgrading, rehabilitating and maintaining 2 500 km of rural roads to LCU at a budget of M1.8 million[19] in 1990 for maintenance of the first 500 km of designated roads; (3) establishment of LCU as the labour-based Construction Works Department; and (4) ability for LCU to embark upon long-term programmes as opposed to ad-hoc approach (Ibid).

(v) Institutional weaknesses:[20] LCU was plagued by shortage of qualified programme staff resulting in foreign expatriate or consultancy syndrome, and therefore lacked the credibility to promote labour-based policy at the highest tiers of government; inability to attract and retain senior local staff activated by the lack of permanent status of LCU highlighted above (Edmond, undated:12). Accordingly, the issue imposed limitations on critical mass of staff, and career development; rendering it unattractive to prospective supervisory staff (Ibid.). As at 1988, the unit still lacked any organisational structure, let alone adequate human capital and capability to execute its new responsibilities (Marshall,

[18] According Marshall, J. (1990:9-10), responsibilities were shared as follows: the Roads Branch was charged with responsibility for Lesotho's primary roads; the LCU responsible for secondary roads; and CWS, rural access roads. .

[19] This was equivalent to approximately US$ 530 000.00 in 1990 (African Development Fund, OPEV. 2000:Annex 2)

[20] Stiedl et al, 1997. Labour Construction Unit, LCU, Lesotho: 19977-1996; SIDA Evaluation 97/5; Department for Infrastructure and Economic Corporation.; pp 15-18

1990:11). Thus, the need to transform itself from a dysfunctional unit into a well-established road agency was paramount. Responding to a joint SIDA/Government of Lesotho request, therefore, ILO carried out an in-depth study to establish a 20-year expansion programme in 1989. The penultimate results were establishment of plans for improved planning and programme design and reorganisation of the field structure on a regional basis in addition to long-term plan for training and retraining of staff and localisation of senior management. By 1997 (20 years after commencement of programme) , the LCU had been reorganised, and established with central and regional offices, well-equipped training centre and 7 Basotho LCU engineers in addition to 11 technical staff funded for degree courses overseas to replace programme Technical Assistant team.

(vi) Failure to achieve the long-term aim of providing significant degree of employment to returning migrant workers from South Africa, probably because it was over-ambitious, and partly due to inaction from government decision-makers regarding policy formulation (Stiedl et al, 1997:2-3). According to the authors, decision-makers failed to instruct government agencies to adopt employment-intensive construction technology, thereby losing potential employment generation, indicative of lack of coherent high-level commitment in the 1980s.

(vii) Delayed maintenance resulting in huge backlog and rapid deterioration of infrastructural assets, placing undue burden on already scarce and overstretched programme funding (Stiedl et al, 1997:20; Edmond, undated:12)

By end of 1992, pressure was mounting on LCU and Government of Lesotho to seek innovative and sustainable delivery methods; general perception among several international donors (championed by the World Bank) was that the force-account system was not cost-effective and efficient.[21]

[21] Personal Communication: Ntoi to Quainoo, 2007. Mr M. Ntoi is an LCU Civil Engineer.

7.3 Post-1993 Lesotho Labour Construction Unit and contracting approach

With exception of the LCU that carried out labour-intensive works by force account system, the construction industry in Lesotho was generally machine-intensive and works were implemented using international contractors and consultants –shift in the manner business was transacted was therefore necessary to add value to the achievement of technical objectives of the road sector (Pama, 1999:151). At the same time, the labour-intensive road programme implemented by LCU using in-house capacity was largely unsustainable (according to World Bank evaluation).[22] Therefore following the ILO study commissioned by GOL and supported by SIDA in 1989, and realising the potential benefits such as cost savings and accountability, the Government of Lesotho eventually decided to embark upon a 20-year development plan in 1990 but with emphasis on contractor development (Stiedl, Danielsson and Sahle, 1997:17, 41). The decision was in line with the Lesotho government's 5th and 6th development plan (1991-1999), to develop the construction industry including the use of the local private sector became paramount (Pama, 1999:152). In 1993/94, LCU started a contractor development programme under the Department of Rural Roads (DRR) – a merger of LCU and CWS – to train locals in labour-based road construction and maintenance to be responsible for the country's feeder road network (McCutcheon, 1989c:59; Andreski et al, 2006:17).

Specific responsibilities assigned to DRR as at 2000 included the following:[23]

- construction and maintenance of all rural roads;
- completion of about 1000 km of community road construction funded by Lesotho Highlands Revenue;
- maintenance of approximately 200 km of completed rural road network constructed by Lesotho Highlands Development Authority around the dams;
- construction and maintenance of footbridges and rural airstrips in inaccessible parts of the country

[22] World Bank. 2004b. Lesotho Road Rehabilitation and Maintenance Project. Implementation Completion Report (IDA-28570); World Bank Report No: 29279; May 25, 2004. Transport Sector, Africa Region. Washington, D.C., p2

[23] Pama, C. 2000. Labour-based works in Lesotho. ILO/ASIST, Bulletin No. 10 January 2000: Country Project News. Before the merger, Mrs. Pama was the Chief Engineer at LCU, Ministry of Works, Maseru, Lesotho.

In total, DRR's responsibility for road upgrading and maintenance increased to 3846 km and was represented in each of the four regions of Lesotho by a senior regional engineer (Business Support Southern Africa, 2004:3). Technical guidelines for low volume labour-based road construction and upgrading were developed (Ibid, p25) for the programme. Under the Lesotho's Roads Transport Infrastructure Programme (RTIP) between 1999 and 2002, DRR was able to upgrade over 61 km of earth roads to all-weather gravel roads at a total average cost of M 342 810.46 per kilometre (Ibid, p4).

At the beginning of the contractor development programme, lack of funds for maintenance had resulted in rapid deterioration of LCU and CWS roads making travelling increasingly difficult in the rural areas (African Development Bank, 2000:11). Table 7.3 shows the appalling road conditions due to lack of maintenance of the country's over 5000 km of network as at 1994 (African Development Fund, 2000:Annex 1:2).

Table 7.3: Conditions of Lesotho's road network in 1994

Overall condition of carriageway	**Type of Terrain**	**% Total road network (paved + gravel + earth roads)**
Good	Lowland +hilly + mountainous landscape	33
Fair	Lowland +hilly + mountainous landscape	35
Poor	Lowland +hilly + mountainous landscape	31

Source: Government of the Kingdom of Lesotho, 1995

All construction and rehabilitation road works were executed using the force account system, while maintenance was largely carried out via private or trained contractors (World Bank, 2002: ToF p17). Maintenance was organised on a length-man system, at a task allocation of 1 – 1.5 km of road per person or trained contractor; by end of 1996, 873 km of road were being maintained (Stiedl et al, 1997:39).

7.3.1 Objectives at conception and implementation[24]

With the aim of developing capacity in the local construction industry in Lesotho, the contracting programme had two clear objectives with embedded training action plans. These were:

(i) to establish a domestic pool of small-scale contractors to undertake labour-based road maintenance and regravelling;

(iii) to establish a system of administration and financial procedures for public works contracts and allow contractors trained in labour-based road maintenance and regravelling to tender for jobs on a competitive bidding basis.

Allied objectives for the contractor development programme were as follows (Andreski, Seth and Walker, 2006:17):

(iii) to strengthen the institutional capacity of Department of Rural Roads (DRR) to manage the contractor training programme effectively and efficiently; and

(vi) to strengthen the capacity of contractors through training of their staff.

Contracting transfers programme or project risks from client to contractor but places increased contract management and administration responsibilities on the client. The third objective, well-thought-out, was important for poverty alleviation, local capacity building and efficiency improvement.[25] However in alignment with employment policy of reaching a wider unemployed mass, jobs on the road upgrading programme were offered on a rotational basis only (Business Support Southern Africa, 2004:21).

[24] McCutcheon, 1989c: Lesotho Labour Intensive Construction Unit: Contractor Development Programme. pp59-60

[25] World Bank. 2004b. Lesotho Road Rehabilitation and Maintenance Project. Implementation Completion Report (IDA-28570); World Bank Report No: 29279; May 25, 2004. Transport Sector, Africa Region. Washington, D.C., p3

7.3.2 Scope of work[26]

The post 1993 labour-intensive programme coverage included the following:

(i) Training and development of small scale contractors to execute labour-intensive construction projects.
(ii) Additional LCU responsibility (apart from upgrading and maintaining 23 000 km of rural roads) of constructing and maintaining 200 km of road projects funded by Lesotho Highlands Revenue Fund.
(iii) Maintenance of LHDA feeder roads around dams constructed.

These responsibilities resulted in the adoption of a 20-year development programme implementable in four strategic phases. In Phase One, the goal was on improving rural road communication and spanned from 1990 to 1992. The emphasis was on research and development of standards, specifications and work methods.

Phase Two, from 1993 – 1998, had the goal of providing large-scale employment opportunity for the rural population. Prominence was given to enhancing capacity for road projects which should result in more job- creation with the commitment to maintain standards and quality of work. The contractor development programme began during this period.

Phase Three (1999-2004) was for expansion of the LCU programme nationwide, whereas Phase Four (2005 – 2010) is exclusively a departure from construction and upgrading to rehabilitation and maintenance of the 2 500 km of rural road network. Figure 7.5 gives the projected cumulative cost and output of the road to be maintained and or upgraded to maintainable condition.

[26] Pama, P. 1999. Labour-based works in Lesotho: capacity building and development of construction industry. CTP 160. pp 151-157

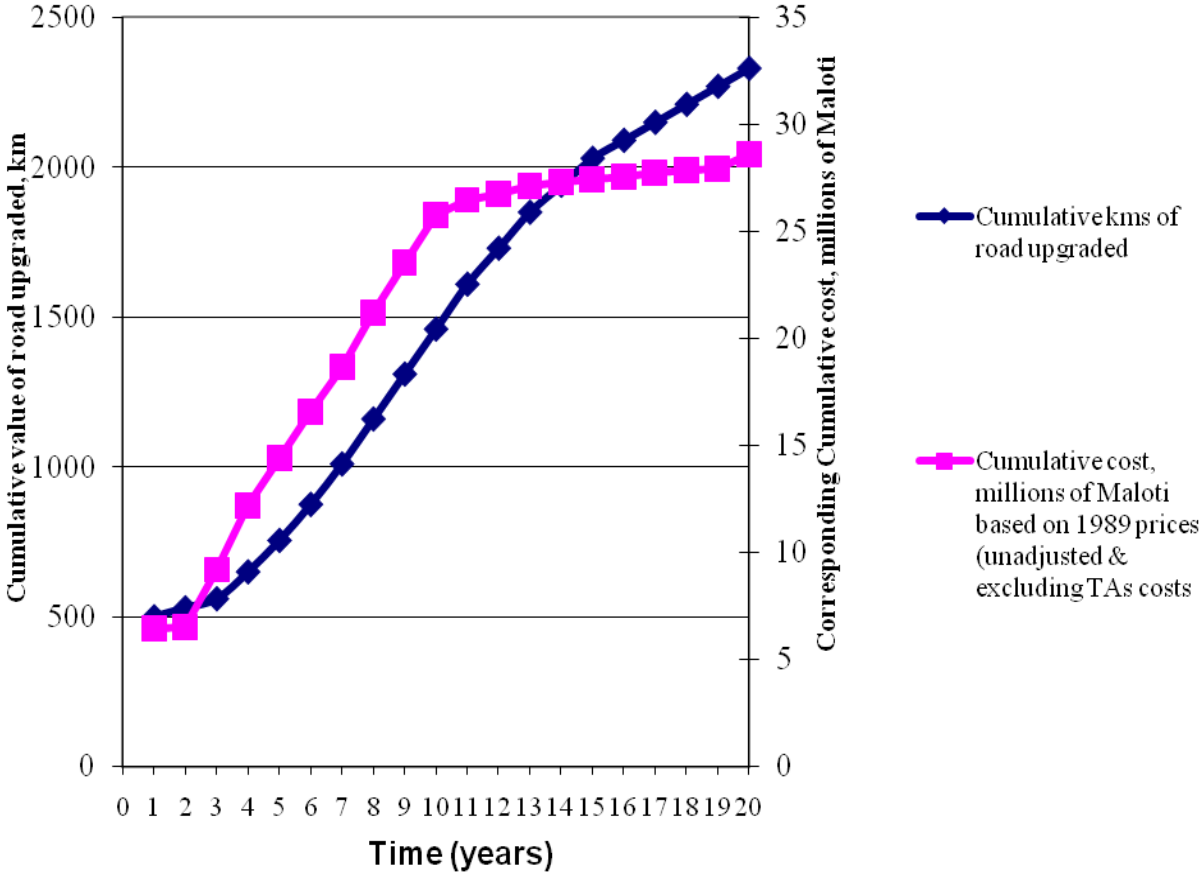


Figure 7.5: Planned output from the 20-year labour-intensive road maintenace and upgrading programme (with 1990 as baseline)

Source: Adapted from Marshall, 1990

7.3.3 Source and structure of programme finance: mechanisms for planning and allocation of resources[27]

Out of a total budget of US$ 129 million for the 1997 – 2003 Road Rehabilitation and Maintenance Project, US$ 124.6 million (approximately ninety-seven (97) perent) was spent for the combined road project. Contributions were US$ 16 million by IDA; US$ 61.9 million by GOL; and US$ 29.3 million by co-financiers. According to World Bank (2004:11), disbursement was as follows: (i) project spending amounted to US$ 107 million; and (ii) amount for institutional reform and capacity building in the road sector in general was US$

[27] World Bank. 2004b. Lesotho Road Rehabilitation and Maintenance Project. Implementation Completion Report (IDA-28570); World Bank Report No: 29279; May 25, 2004. Transport Sector, Africa Region. Washington, D.C., p11

14.8 million (twelve (12) percent of total cost). In general, routine maintenance contracts were funded by the Government of Lesotho; gravelling contracts were however donor-funded (Berentsen, 1996).

7.3.4 Implementation Strategy and programme delivery

A major challenge to the implementation of the 20-year expanded programme was insufficient capacity. LCU therefore adopted a three pronged strategy to overcome the situation (Pama, 2000): (i) training and development of small scale contractors to execute all maintenance and rehabilitation road works; (ii)increasing force-account teams by training more supervisors; and (iii) strengthening in-house capacity by orientation and employment of local consultants.

Agreements signed between GOL and IDA to develop small scale road contractors resulted in the adoption of phased training approach (Pama, 1999:152-153; Bentall, 1999:28) of which twenty (20) contractors were trained during the first phase. Local consultants experienced in road construction played significant roles in LCU programmes.

According to Pama (1999:155) and Seth (2004:2) consultants carried out several responsibilities including (i) training of LCU technical staff and contractors; (ii) survey and design of selected routes for labour-based road construction; (iii) preparation of bills of quantities, contract documentation, invitation of bids, tender evaluation and recommendation for tender awards; (iv) contract administration on behalf of LCU, including mentoring performance of trained small-scale contractors.

The second phase had the immediate objective of training thirty-six (36) contractors (Pama, 1999:153). To help achieve programme objectives, each batch of graduates was given a stretch of road network as contract to execute. Accordingly, all road rehabilitation, periodic and routine maintenance works were assigned to trained contractors. But whereas routine maintenance could be allocated to all trained contractors via the ballot system, rehabilitation and periodic maintenance activities contracts were only awarded through formal bidding procedures (Ibid).

For the trial contracts, contractors were provided with basic construction equipment worth US$ 6 670 re-payable over the six-month contract duration (Larcher, 2001:3). Further equipment acquisition by the trained contractors was achieved through direct purchase or indirect procurement (lease financing arrangement) with a one-year payback period (Bentall, Beusch, and de Veen, 1999:101; Larcher, 2001:3). The problem with the second method of acquisition, however, was lack of guaranteed further contracts to enable repayment (Ibid). Contracting and force account system were used in tandem for road construction, upgrading and maintenance as shown in Figure 7.6 (Stiedl et al, 1997:41).

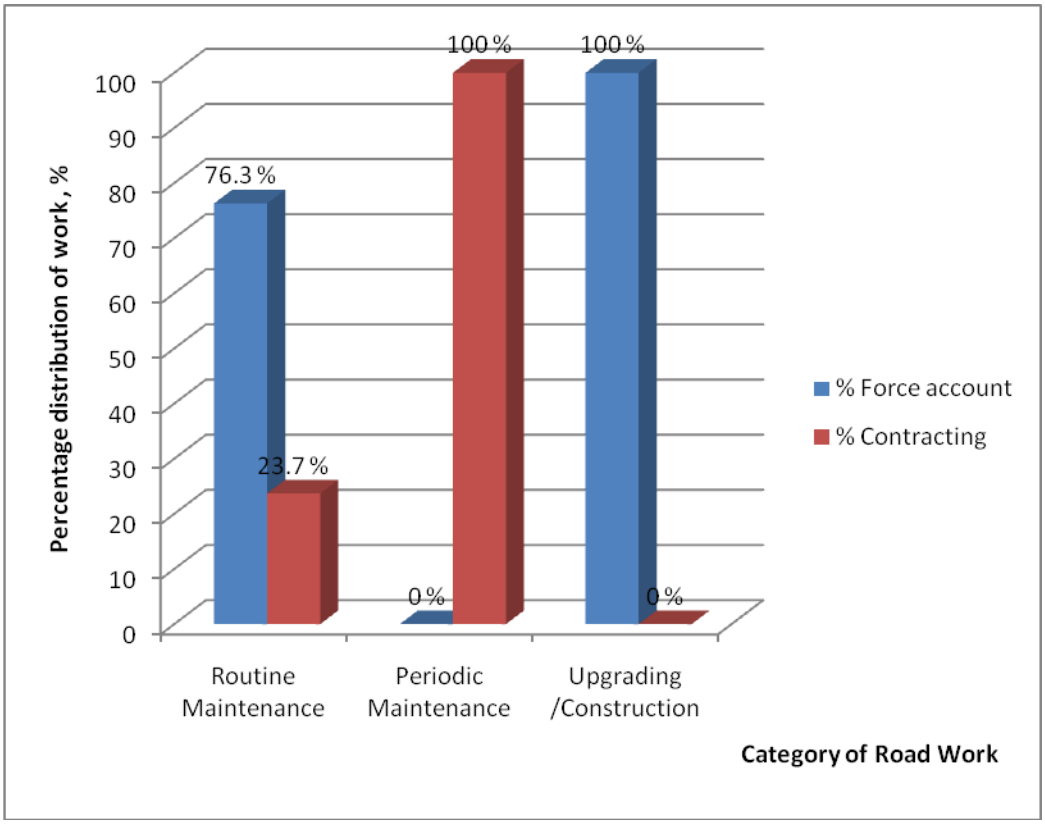


Figure 7.6: LCU category and work distribution between force account system and contracting as at end of 1995
Source: Adapted from Stiedl et al, 1997

7.3.4.1 Training programme: target group and selection process[28]

Central to efficient resource allocation, utilisation and good performance of the contractor development programme, was a rigorous selection process based on well-documented policy for appropriate candidates. A basic ingredient was that eligible trainees should first and foremost exhibit some degree of business acumen (McCutcheon, 1989c:60). The programme targeted three groups, namely:

(i) existing Basotho building contractors with understanding of the competitive nature of the construction industry, but lacking plant and experience in the road sector;
(ii) haulage contractors who owned tipper trucks with the potential of making them competitive for regravelling, but lacking experience in building contracting and labour-based works;
(iii) LCU road supervisors, chiefly Technical Officers, who possess relevant technical know-how and experience but do not have capital and lack entrepreneurship to establish a thriving business.

Selection criteria comprised the following:[29]

- Invitation of interest groups through local advertisement;
- Filing of applications to LCU, and evaluation by unit senior staff;
- One-day workshop and proficiency test followed by evaluation of results for penultimate applicants by LCU;
- Finally, personal interviews of potential candidates where personal information submitted in the application forms were verified.

The training programme was preceded by preparation of draft training material; thirteen (13) candidates, constituting the first batch of trainees, were trained in technical issues (routine maintenance and regravelling of road works), business management, site management, and

[28] McCutcheon, 1989c: 60-63
[29] McCutcheon, 1989c: The Lesotho Labour Intensive Construction Unit: Contractor Development Programme. pp60-61

tendering and estimation of road contracts (Bentall, Beusch and de Veen, 1999). In sum, training schedules of sixteen (16) weeks were planned as follows:[30]

(i)	Theoretical training in road maintenance and regravelling	3 weeks
(ii)	Hands-on practical training in routine maintenance	4 weeks
(iii)	Theoretical training in business management	3 weeks
(iv)	Practical training in regravelling road works	6 weeks

Within a period of a month and a half, 12 training contracts in routine maintenance of about 195 km of gravel roads were awarded to trainee contractors through the Lesotho Central Tender Board during the last quarter of 1993 (McCutcheon, 1989c:62). To ensure continuity of work and development of training acquired, contractors were not only offered routine maintenance and regravelling work through the ballot system or non-competitive bidding but in addition qualified contractors were allowed to bid competitively for road earthworks contracts (McCutcheon, 1989c: 65; Seth, 2004:2). At later stage, the training programme was standardised as summarised in Table 7.4:

Table 7.4: The Lesotho Contractor Training Programme

Type of Training	Period	Entry conditions	Trial contracts	1st Trial contract & value	2nd trial contract, value, conditions	3rd Trial contract	Final Contract
Phase I: ROMAR	Nine months	As highlighted in McCutcheon, 1989c: pp60-63	Upon successful completion of ROMAR, contractor executes one, no-bid, Routine Maintenance (RM) contract	Routine Maintenance **<** US$10, 000	Execution of **> 1** "RM" contract Condition: good performance in 1st Trial and capacity	Periodic Maintenance work	Rehabilitation road works **<** US$100, 000
Phase II: ROCAU	Twelve months	Trainee must succeed in ROMAR, and successfully implement rehabilitation contracts					

Note: ROMAR stands for Road Maintenance And Rehabilitation
ROCAU denotes Road Construction And Upgrading
Source: Adapted from Andreski et al, 2006:17

[30] Ibid, p62

7.3.5 Achievements: Results, Outcomes and Impact

The World Bank rates the programme as relevant, effective and efficient with many objectives met and in some instances exceeding targets (World Bank, 2006:9). These affirmations particularly applied to programme objectives of improved rural accessibility and development of emerging contractors for labour-intensive road works (Ibid, p7). Contractors were trained in road maintenance activities, and were responsible for capacitating their own site agents (Bentall, 1999:28). Prior to the contractor development initiative, no Basotho owned road construction or maintenance companies (Stiedl et al, 1997:18). However, by 1997, 24 contractors had been trained for road maintenance and re-gravelling with a third batch undergoing training (Ibid, p39). The number of contractors trained, according to World Bank (2004:6) trained under DRR alone between 1997 and 2003 increased to sixty-five (65) in mid-2004 (which was 100% achievement). In addition, 24 contractors from South Africa (Limpopo Province) had been trained by 2004 (Seth, 2004:2). (Tables 7.5a and 7.5b capture the achievements under the phased contractor training programme. By 2006, the programme had trained 105 contractors to execute various labour-intensive road works (Andreski, Seth and Walker, 2006:17). Under the European Union funded Road Infrastructure Maintenance Programme between 1999 and 2002, DRR upgraded over 60 kilometres of earth access roads to all-weather gravel roads at a total cost of M20.98 million (Business Support Southern Africa, 2004:4).

Table 7.5a: Number of contractors trained and graduated

Batch	Year	Number of applicants	No. selected for proficiency test	No. selected for interview	Final intake	No. graduated in routine maintenance	No. graduated in gravelling
1	1993/94	80	30	15	13	13	8
2	1994/95	105	35	15	12	12	13
3	1996/97	87	35	15	12	12	11
4		120	35	15	13	13	8
5		101	35	16	14		
Total		**493**	**170**	**76**	**64**	**50**	**40**

Source: McCutcheon, 1989c

Table 7.5b: Kilometres of roads constructed by contractors trained

Batch	Length of road regravelled, km	Estimated cost, M	Actual cost, M	Start	Completion
1	21.5	958146.00	958146.00	01/03/1994	30/07/1994
2	20.1	1453318.09	1453318.09	01/09/1995	31/12/1995
3	18.4	1355022	1456200.87	15/04/1997	31/08/1997
4					
5					
Total	**60**	**3766486.09**	**3867664.96**		

Source: McCutcheon, 1989c

Notable objectives achieved under DRR documented by the World Bank (World Bank, 2004b:6-8) include inter alia:

(i) improved accessibility to remote countryside through rehabilitation of all planned rural road network;

(ii) development of private local road construction capacity and maintenance industry, and partial phasing out of force account system;

(iii) completion of 315km of rural gravel road that required periodic maintenance and rehabilitation of 184 rural gravel road (out of planned 499 km);

(iv) rehabilitation of 392 km badly deteriorated rural gravel road to as-built, maintainable standards;

(v) establishment of a well-equipped training centre at Teyateyaneng for training in emerging contractors and consultants in labour-based methods;

(vi) training of 65 small scale labour-based road contractors (maintenance and rehabilitation) and additional 10 contractors in road construction and upgrading;

(vii) training of own project staff and consultants in the industry for supervision of small-scale labour-based contractors;

(viii) development of training material for design, tendering, procurement, quality assurance, contracting and contract management for small scale labour-based projects

Comparative analysis carried out in 1995 indicated that conventional method of construction in Lesotho was thirty-seven (37) percent more expensive than employment-intensive

construction notwithstanding the high daily wage rate of US$ 4.90 (Tajgman and de Veen, 1998: 15).

As at 2002, labour-intensity had increased from forty-four (44) percent (Stiedl, Danielsson and Sahle, 1997:3) to about sixty (60) percent (World Bank, 2002: ToF17) with wages for casual labourers paid at government of Lesotho's statutory minimum rate and remaining the second highest employment institution in the country providing jobs for over 2 500 workers (de Veen, 2002:5). By 2006, it had generated over 4000 temporary jobs (Andreski, Seth and Walker, 2006:17). In accordance with the DRR rotational employment policy, labourers worked for a maximum length of 3 to 4 months (Business Support Southern Africa, 2004:21).

The contractor development set-up attracted of foreign candidates – trainee contractors – to participate in the programme.[31]

7.3.5.1 Interpretation of achievements

The achievements highlighted above demonstrate the practical implementation of contractor development programmes to execute road maintenance works, thereby phasing out the force account system.[32] Reasons[33] for the success include, inter alia, (i) long-term technical assistance; (ii) adequate attention to selection and mentoring of local staff; (iii) use of methods specification for achieving quality of labour-based work; (iv) gradual award of contracts of increasing complexity, conditional upon performance and capacity of contractor; and (v) appropriate packaging of work contracts. The latter, according to Andreski et al (2006:17), serves a dual purpose of effective contract management by the client while simultaneously enable the contractors develop the requisite learning curves.

[31] Andreski, A; Seth, S; and Walker, W (2006:17). How a Road Agency Can Transform Force Account Road Maintenance to Contracting. *The World Bank Group; Transport Papers TP-11, June 2006. Washington D.C.*
[32] Ibid.
[33] Ibid.

7.3.6 Main findings, problems and issues

- A host of problems and challenges continued to plague LCU even during the contractor development programme. Issues of major concern in 1999 still remained the insufficient institutional capacity and inadequate budget which made additional responsibilities difficult to execute with high time overruns (Pama, 1999:154; World Bank, 2004b:2). To reduce the design and supervision burden, LCU resorted to orienting and using local consultants, and training of more force-account technicians (Pama, 1999:154). Another challenge is how to deal with the increasing *casualisation* of labour (Business Support Southern Africa, 2004:21) – a characteristic feature of most labour-based programmes.

- There were serious start-up implementation delays attributed to administrative inaction and inadequate capacity in the LCU[34] probably because the time required for change of government policy and institutional reform was highly underestimated (World Bank, 2004b:5). Other problems included poor inter-agency coordination, inadequate funding, project time overruns, delays in staff training and slow disbursements of project funds due to lack of capacity.[35] It took nine months to staff the project unit; and the ripple effect was time-overruns in the implementation of the road maintenance programme.[36]

- Stiedl et al (1997:3) reported that routine maintenance costs were excessive and the quality of work unsatisfactory, indirectly a reflection of neglect of periodic maintenance and ineffective use of resources. However, this could be attributed in part to inadequate contract management and administration by the LCU.

---

[34] World Bank. 2004b. Lesotho Road Rehabilitation and Maintenance Project. Implementation Completion Report (IDA-28570); World Bank Report No: 29279; May 25, 2004. Transport Sector, Africa Region. Washington, D.C., p3

[35] Ibid, p5
World Bank. 2006. Lesotho Road Rehabilitation and Maintenance Project. Project Performance Assessment Report (Credit 2857-LSO); Report No: 35049-LS; January 25, 2006.Sector, Thematic, and Global Evaluation Division, Independent Evaluation Group. Washington, D.C., p ix, 5.

[36] World Bank. 2004b. Lesotho Road Rehabilitation and Maintenance Project. Implementation Completion Report (IDA-28570); World Bank Report No: 29279; May 25, 2004. Transport Sector, Africa Region. Washington, D.C., p5

- Women participation was low despite conclusive statements about comparable levels productivity as their male counterparts; probably because of absence of any definite recruitment policy (Stiedl et al, 1977:29). Accordingly, 1994-1995 figures for example indicated only sixteen (16) percent field work women involvement with seventy-nine (79) percent as administrative staff and nineteen (19) percent technical staff (Ibid).

- Routine maintenance costs (US$ 1 500/km) were exorbitantly high compared with SADC (about three times) recommended figures (Stiedl et al, 1997:39). The abnormally high costs were orchestrated by irregular and untimely periodic maintenance due to lack of fund allocations triggering rapid road deterioration. Consequently, part of the annual recurrent maintenance funding was used for spot improvements to prevent further damage (Ibid). Achievement of high quality output at lower cost depends on a number of worker motivation and productivity-related issues (Tajgman and De Veen, 1998:19), namely *(a) site organisation and management; (b) incentive schemes (for example, bonuses, rewards, task work, piece work); (c) design of quality tools; (d) regular and timely payment; (e) effective communication; (f) environmental conditions; (g) health and safety plans; and (h) accident prevention and insurance coverage.*

- Failure to strike a strategic balance between quality and duration of training of staff and contractors caused series of project time overruns with resultant cost-overruns (Stiedl et al, 1997:41). Comparatively, programme staff could manage projects successfully with little interventions whereas newly trained contractors struggled to perform on more complex jobs. Other deficiencies and problems were reported in areas of estimation, tendering of work and late payment of the workforce.

- As at 2000, LCU was still plagued by lack of qualified and experienced programme staff for road planning and design, appraisal, management and control activities; and it was unable to attract and retain engineers with requisite experience (African Development Fund, 2000:9). The private sector eventually became the largest beneficiary of programme engineers trained with scarce

available resources – indicative of institutional weakness and underlying flaws in the institutional capacity development system with negative consequences for programme implementation (World Bank, 2001b:7; 2006:1).

- There was no guarantee of continuity of work contracts for contractors trained in road maintenance activities because of the competitive bidding (Bentall, 1999:28).

- Reporting on the Road Rehabilitation and Maintenance Project in general has been problematic, especially at the onset. For example, individual reports were submitted by the Roads Board, LCU and the Project Management Unit at the expense of integrated quarterly and annual reports and performance indicators (World Bank, 2004b:11).

7.4 Lessons and Conclusions

Despite the initial problems and the unfavourable terrain, the Lesotho Labour-intensive Construction Unit (and later Department of Rural Roads) feeder road programme has demonstrated the technical feasibility and financial competitiveness of using labour intensive programmes to alleviate fundamental socio-economic problems of unemployment and basic infrastructure backlogs. A high standard of road construction was achieved, notwithstanding developmental challenges posed by the country's topography. Comparative analysis showed that labour-intensive method of road construction was about thirty-seven (37) percent cheaper than conventional methods.

Department of Rural Roads records in 2002 showed labour-intensity of approximately sixty (60) percent of total project cost translating into 23 000 worker-years of employment. Prior to the programme, the realisation was that the economic growth rates had failed to translate into corresponding employment opportunities. It required government intervention in the form of sound employment generation policy.

The adoption of a twenty-year labour-intensive road programme in 1990 with (more than a decade of prior experience) is indicative of the relevance of innovative, non-conventional methods of construction for infrastructure provision. To date, the contractor development

programme has been a success and continues to be relevant to the country and neighbouring states.

The two successful programme implementations before and after 1993 highlight the feasibility of operating two delivery systems (force-account and contracting). However, the contracting approach is the most preferred method by several donor agencies because of perceived better cost-effectiveness and efficiency. Arguably, the force account system could be harnessed to the maximum in the wake of general absence of client capacity (at national and regional levels) to execute effective contract administrative functions. This explains why DRR resorted to using the two systems of delivery in tandem. In addition, timely response to natural disasters demands some in-house capacity to handle such emergency situations. Thus, the LCU tried to abolish the force account system completely but was unsuccessful due to realities such as lack of requisite capacity and other constraints to successful implementation of rural programmes via contracting and competitive bidding.

Reasons for the success story include, among other contributory factors, the following:

(i) Adequate preparations in relation to policy formulation, institutional arrangements, programme planning, training and capacity development.
(ii) Government commitment and policy direction for employment creation; financial support, and additional donor funding and resources received.
(iii) Relevant training, and institution of appropriate selection criteria (or threshold entry levels) for trainees (including prospective contractors).
(iv) Establishment of a training centre to look after programme staff and contractors' needs. Success of contractor development hinges on a number of factors such as appropriate training and monitoring; guarantee of work; timely and regular payments of works completed and effective contract administration and management by client.
(v) Close supervision of work to control quality of product.
(vi) Provision of rudimentary construction equipment, necessary for the work, given the difficulties emerging small contractors face in securing bank finance.
(vii) Adoption of a 20-year programme to reduce unemployment through rural development and infrastructure provision.

In spite of the positive impact of the LCU and DRR programmes on poverty reduction in Lesotho, certain deficiencies ought to be internalised and treated in order to enhance future programme performance. These issues include:

(a) Lack of adequate, reliable government funding for mainstreaming labour-intensive construction methods in the national economy. It reduces meaningful poverty and unemployment reduction and rural developmental efforts. In particular, governments should recognise donor money as necessary additional funding and not the main source of money for poverty alleviation programmes through labour-intensive construction methods of infrastructure provision.

(b) Problems with institutionalisation lead to undesirable implementation delays, lack of policy direction, ad-hoc planning as opposed to long-term programmes and ineffective use of resources.

(c) Institutional weaknesses have sufficient influence to render the programme unattractive to recruiting, developing and retaining capacity. If not addressed satisfactorily, would make the implementing programme units dysfunctional.

(d) Increasing *casualisation* of labour despite more than three decades of labour-intensive road programme in the country. In Lesotho, the government had to resort to a rotational employment policy because of the high unemployment rate. Research should seek appropriate solutions to the *casualisation* issue, a common feature of most labour-intensive construction programmes. Though road provision has a strong correlation with economic growth, it should arguably be linked to economic potentials from the respective rural developments. In particular, instead of embarking on a road programme alone, an integrated rural development programme is recommended. This would enable labourers to be useful for multi-purpose projects.

Despite the deficiencies, the Lesotho programme has demonstrated the technical feasibility and financial competitiveness of labour-intensive construction methods for poverty reduction through rural road infrastructure provision. The significance of the S-curve in relation to productivity or kilometres of road constructed and employment generated, particularly the

initial slow build-up to allow for good preparation, must be clearly understood by all stakeholders including politicians if success and sustainable results are to be achieved in any employment-intensive programmes. Political pressure to deliver and fast-tracking of development programmes of such complexity and magnitude inevitably lead to undesirable implementation problems and thereby prevent it from achieving intended objectives.

The above mentioned reasons for success indicate that like the other four sub-Saharan labour-intensive infrastructure programmes, implementation of the LCU was successful so long as political support and commitment underpinned by appropriate policy, good prior preparation, relevant and adequate capacity development, and financial support were in place.

CHAPTER 8: FINDINGS AND LESSONS FROM THE FIVE SUB-SAHARAN LABOUR-INTENSIVE ROAD PROGRAMMES: BASIC INGREDIENTS FOR SUCCESS

8.1 Findings from the five sub-Saharan experiences

In one form or another, all five programmes were operational for at least fifteen years. Internal analysis and cross-country comparison reveals various common factors that contributed to their longevity. However, a question remains: why, with the exception of Lesotho, have these programmes ceased to be implemented or have been so changed as to have departed significantly from the original objectives? Answers are important to contribute to future endeavours.

Succeeding paragraphs summarise the major findings: first, positive results that encapsulate the overall good practice, followed by shortcomings to be avoided.

Results and analyses of the labour-intensive infrastructure programmes from Kenya, Botswana, Ghana, Lesotho and Malawi, demonstrate that:

- Given adequate resources, human capital, government support and adequate preparation, (i) a high standard of construction could be achieved using labour-intensive methods even across difficult terrain, and (ii) significant additional employment per unit of expenditure could be generated cost-effectively.

- Adoption of a long-term programme approach to poverty alleviation through rural infrastructure development cannot be overemphasised since there is no quick fix, or short timeframe for significant poverty reduction, and capacity development. A considerable time period is required. Given the complexity of employment-intensive infrastructure programmes, a sufficient lead-in time is needed to sort out institutional, technical, training, organisational, administrative and general management issues prior to seeing tangible results on the ground. This concept is illustrated by the initial slow pace of construction in all the successful sub-Saharan labour-intensive programmes.

- Government commitment and policy direction for employment creation (including training and capacity development) are indispensable in poverty alleviation.

- Programme Champions are crucial to secure and sustain commitment in terms of funding, resources, and sound management of programmes from inception through implementation to the realisation of intended benefits.

Despite the remarkable achievements in the early programmes compared to the initial large-scale labour-intensive infrastructure programmes started in the 1980s with strong financial support and technical assistance, current programmes fall short of expectation in terms of planning, implementation procedures and technical efficiencies., subsequent endeavours were dotted with serious shortcomings or underlying problems that led to their ineffectiveness or demise. Major shortcomings included the following:

- Lack of a coherent national policy (in relation to training and capacity building, conditions of employment and wage rates). An example was differential wage policy that sets wage rates too low to attract and retain professionals and other workers. It results in inadequate capacity to plan, implement and manage the programmes

- Change in policy dictated by the donors. A typical example was the introduction of competitive bidding for labour-intensive works, which was ill-conceived. Consequently, labour-based contractors were outweighed by the equipment-intensive contractors. Thus, proper conditions of contract and specifications are warranted for the promotion of continued labour-intensive construction methods to alleviate poverty.

- Lack of sustained local funding and over-reliance on donors. The problem was aggravated by financial mismanagement (including misallocation of funds) and lack of accountability. Ultimately, often construction activities had to be *shelved* until money became available.

- Lack of localisation of key positions rendered programmes venerable to collapse once expatriates were withdrawn. Thus, conscious effort must be made to develop local capacity for long term survival of the programmes.

- Lack of understanding and commitment to labour-intensive construction. Symptoms include poor or inadequate planning, absence of serious training and capacity building, lack of commitment to road asset management (including maintenance).

- Amalgamation of development and relief programmes, or inability to delineate between the two will almost invariably lead to inferior product due to inadequate training.

- Inappropriate wage rates: in one case, wage rates for labour-intensive work were allowed to fall to the level of those for neighbouring relief projects.

- Lack of programme champions in subsequent programmes to maintain government commitment and momentum of respective programmes.

- Decentralisation of programmes in several countries failed due to administrative capacity challenges and resource constraints. Programme expansion or decentralisation should therefore give due consideration to capability and resources available.

Other problems included:

- Too many, and over-ambitious, programme objectives. Employment creation programmes cannot solve all socio-economic woes. Objectives should therefore be realistic and achievable given timeframe and budgetary constraints.

- Compared to the initial large-scale labour-intensive infrastructure programmes started in the 1980s with strong financial support and technical assistance, current

programmes fall short of expectation in terms of planning, implementation procedures and technical efficiencies.

- Generally, attempts to shift completely from force-account to contracting have either been partially successful or a failure. Problems range from technical and managerial inadequacies on the part of the small contractor to insufficient contract administration and breach of contractual obligations by the client (for example, with regard to payment). In some instances, the force-account and contracting systems were used in tandem because of lack of client capacity.

- Lack of government commitment to contractual obligations, manifested in the form of delayed payments to contractors, for example. In some instances, trained labour-based contractors were not engaged. Thus, with no guarantee of continued work, involuntary exit from the programme became the pattern.

- Inadequate contractual preparation or corrupt practices in the procurement process.

- Data was difficult to obtain due to institutional memory loss: lack of systematic documentation of programmes and projects undertaken, together with good practices and general lessons learned. Where institutional memory loss occurred, some training resources had to be reinvented thereby putting unnecessary pressure on available limited resources. Recording, reporting and knowledge management of best practices need serious attention for future programmes.

8.2 Lessons, Conclusions and Recommendations

Deriving from the foregoing discussions, the following conclusions and recommendations may be drawn:

- Success of labour-intensive, poverty alleviation programmes depends largely on government commitment to succeed, an adequate preparation, sufficient resources, and requisite capacity. Local or government funding is crucial to the sustainability of employment-intensive approaches to infrastructure provision. Donor funding should only be regarded as a *bonus.*

- A coherent, sustained, national policy is necessary to give direction to address important issues such as training and capacity building; remuneration; and specific conditions of contract for labour-intensive construction.

- The need for a Programme Champion for employment-intensive and poverty alleviation programmes to foster commitment to succeed needs meticulous consideration.

- Programme goals and objectives should be tailored to suit available resources, capacity and time constraints. Multiplicity of objectives dampens the effectiveness of employment creation programmes.

- Over-dependence on expatriates is unhealthy for the long-term survival of infrastructure development programmes. Salient positions should be localised as much as practicable.

- Development programmes should always be separated from relief endeavours since the former requires sufficiently adequate timeframe for serious preparation.

- Decentralisation of employment creation programmes should be pursued once commensurate resources and capacity needs are guaranteed. Preferably, a strategic balance should be maintained between centralisation and decentralisation.

- Attempts to outsource employment-intensive road construction programmes through small-scale contracting will continue to produce mixed results unless both contractors and the clients are adequately prepared and committed to honour their contractual obligations. In particular, technical, managerial and contract administrative capacities should be strengthened to meet the new challenges resulting from changes in method of infrastructure delivery.

- Monitoring and evaluation should be institutionalised as an integral component of every employment-intensive infrastructure programme for two reasons: (a) to improve future programme performance; and (b) to pre-empt institutional memory loss. Equally, no similar future projects or programmes should be given permission to proceed without having factored in lessons from previous programmes. In addition, recording and reporting systems should be strengthened in order to ease difficulties associated with programme evaluation.

- Small contractor development is complex and requires serious attention. For trained small contractors to survive and accumulate requisite experience, policy instruments should be made available to ensure guaranteed work, and creation of a good enabling environment. Change from force account system to contracting demands a shared responsibility.

8.3 Predicting the Success or Failure of Development Programmes

The analyses and conclusions of the five case studies indicate that programme performance depends on several critical interdependent factors such as level of funding, policy and commitment, resources and capability of implementing departments, level of preparation, and

approach to poverty alleviation. Unlike experience in South Africa, funding proved to be a limiting factor to the degree of success in all the five sub-Saharan labour-intensive programmes.

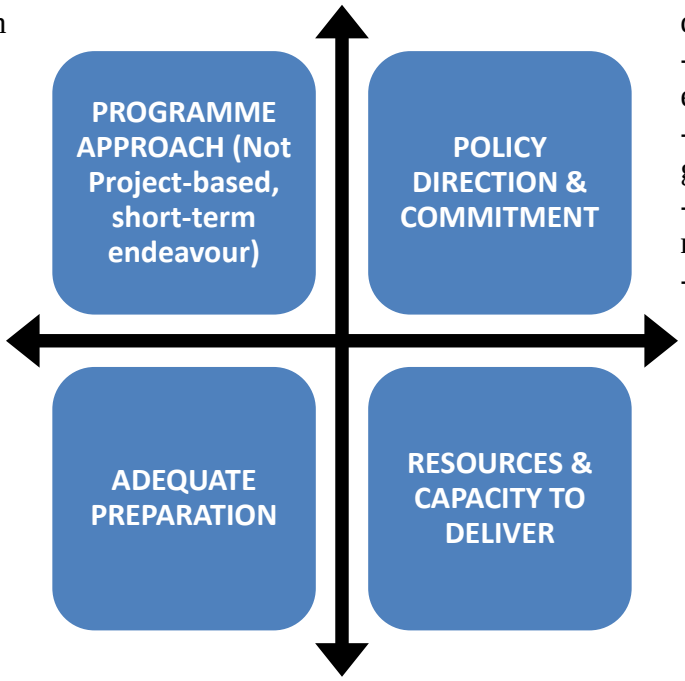
Similarly, the degree of poverty reduction would also depend on government policy and commitment. In particular, the employment policy, commitment to the use of labour-intensive construction methods and policy on training would together ascertain whether the socio-economic problems are merely massaged or effectively alleviated.

Besides, success would also depend to a large extent on the degree of preparation. The literature indicates that for good programme implementation, time for planning and design should be at least equal to the duration of implementation. All large-scale programmes (whether in developed or third world countries) that resorted to fast-tracking ended up with unsatisfactory results in terms of time, cost and programme benefits. Thus, adequate lead-in time to allow sufficient early preparation is essential.

Equally, the approach to poverty alleviation – project-based or programme – determines the impact on reduction of poverty and unemployment, and level of training and skills development on each project. Project-based projects or short-term *programmes* result in dilution of proper training and capacity development, over-casualisation of labour, and ultimately fail to achieve the intended objective of poverty and unemployment alleviation.

Therefore, as a tool to predict the success of infrastructure development programmes, these factors are aggregated into four key drivers in Figure 8.1. Each element in a quadrant must be adequately satisfied to ensure significant positive effect on poverty alleviation.

Programme approach has good impact on poverty alleviation. (Ad-hoc planned, project-based approach massages the socio-economic problems).



- Understanding of basic development issues
- Employment policy & evaluation
- Commitment from all tiers of government
- Commitment to construction method
- Programme Champion

Issues:
- Institutional
- Technical
- Financial
- Managerial + Monitoring & Evaluation plan
- Administrative
- Social

- Adequate, reliable funding
- Adequate training & capacity building
- Management of training
- Monitoring & Evaluation

Figure 8.1: Predicting the success of infrastructure development programmes

CHAPTER 9: POLICY GUIDELINES FOR LABOUR-INTENSIVE INFRASTRUCTURE DEVELOPMENT PROGRAMMES IN SOUTH AFRICA'S POOR PROVINCES

The use of labour-intensive construction methods for provision of technically sound infrastructure development projects in South Africa spans across both Apartheid and post-1994 eras (Horak et al, 2000:1; Croswell, 1989; McCutcheon and Marshall, 1998:2). Good quality, Water Bound Macadam (WBM) and Penetration Macadam (PM) roads constructed labour-intensively in Johannesburg since the 1940s are still functional.[1]

Examples of old WBM and PM roads include the following:

- Main Reef Road (all remaining single carriageway portions)
- Portions of Jan Smuts Avenue
- Most streets in the older suburbs of Johannesburg (like Parktown North and Parkhurst)

In addition, examples of new Water Bound Macadam roads include:

- Portions of Xavier Street, Southgate in Johannesburg
- Part of Club Street (Linksfield, Johannesburg)
- Part of KwaZulu Natal South Coast freeway (approximately 12 km of N1-28 at Matoks, Limpopo Province)

However, successful nationwide replication of this innovative construction technique still appears remote in South Africa (Thwala, 2000; 2005; 2006; 2007). The brief discussion in Chapter 2 demonstrates that lack of serious commitment to labour-intensive methods, together with the absence of integral training and capacity building components, has been one of the underlying reasons for the poor performance of most infrastructure development initiatives in

[1] Horak, E., Ras, C. and Dlamini, M. 2000. Appropriate Technology Management of Labour-intensive work in Greater Johannesburg. ILO/ASIST 1996 Regional Seminar Papers.
Personal Communication: Van Steenderen to Quainoo, 2008. Mr. W.P.C. Van Steenderen is a retired Eskom Civil Engineer in Private Practice; and formerly Research Fellow at Research Centre for Employment Creation in Construction, School of Civil & Environmental Engineering, University of the Witwatersrand.

South Africa. A 2009 analysis of the Expanded Public Works Programme (EPWP), for example, indicates that the infrastructure component originally planned to be implemented labour-intensively *is currently not a development programme* but an *ad hoc collection of existing programmes and projects* (McCutcheon and Taylor-Parkins, 2009:202). In addition, government's implementation policy to use labour-intensive methods, a condition for the acquisition of additional EPWP funding, was largely ignored on the ground (Ibid). Consequently, according to McCutcheon and Taylor-Parkins, *no additional employment has been generated per unit of expenditure.* These major conclusions indicate that the Expanded Public Works Programme is labour-intensive by policy and partly business-as-usual in execution. Why the ineptitude, and what are the hindrances? Can the experiences from other sub-Saharan countries help improve policy formulation for successful implementation in South Africa?

To address the above questions, a brief history and development of labour-intensive construction programmes in South Africa is traced, followed by an interim evaluation of the EPWP, as at 2007. The analysis and discussion terminate with projections for the future about suggestions to make successful replication a reality, and policy guidelines in the form of policy workability test for labour-intensive construction programmes.

9.1 Employment-Intensive construction Programmes in RSA: Past, Present and Future

Like other developing countries with deeply entrenched socio-economic problems such as infrastructure backlogs, unemployment, poverty and related issues, several attempts have been made in the past to implement labour-intensive infrastructure programmes but with mixed results (McCutcheon, 2000:3).

With the exception of the first serious attempt at Ilinge in the 1980s (in the Eastern Cape Province) (Croswell, 1989) colossal amounts have been spent on purported employment-generation programmes since the 1980s. Examples of such programmes include the KwaZulu Natal infrastructure development programme, Special Employment Creation Programme, Strategic Oil Reserve Fund Employment Creation Project, Independent Development Trust (IDT), Reconstruction and Development Programme (RDP), and then National Public Works

Programme (NPWP) and its precursor, the Community Based Public Works Programme (CBPWP) in the 1990s; followed more recently by the EPWP. Generally endeavours in this field of development engineering have yielded little success (Thwala, 2005, 2007). Reported earlier (prior to 1993) and then re-emphasised in 1998, McCutcheon and Marshall (1998:2) documented results from employment-creation programmes to reduce poverty in South Africa as follows:

> *(i) Very little sustainable employment was created.*
>
> *(ii) The assets constructed were not cost-effective, of doubtful value and ill-maintained (the results have often disappeared).*
>
> *(iii) Little national, provincial, and local institutional capacity building took place. Internal planning, monitoring and control were severely lacking. Independent evaluation was noticeable by its absence. Given the lack of systems of planning and monitoring systematic evaluation would have been extremely difficult, anyway.*
>
> *(iv) The expenditure on development failed to reach the target group to the extent envisaged.*
>
> *(v) Individual skills were not improved. Training, where present, was not particularly appropriate or focussed and has not shown itself to be carried through into post-project employment.*

Reasons for the dismal performance range from lack of understanding and political commitment, through absence of policy direction for employment-creation and inadequate planning, to general institutional weaknesses (e.g. skill deficits)(McCutcheon and Marshall, 1998:2-4). Any future similar programmes must therefore address these issues for improved results. A major planned attempt at using employment-intensive methods to help reduce poverty and unemployment is the fairly recent Expanded Public Works Programme (EPWP) initiated in 2003/04 – which may be perceived as offspring of the National Public Works Programme. But the question is, has past experience informed decision making and planning to the extent of getting things right this time in order to improve programme performance? Succeeding paragraphs will briefly describe and discuss the present EPWP, its strengths and success, implementation failures and weaknesses; and map the way forward.

Given the high unemployment levels, lack of general capacity and individual skills and other socio-economic problems probably attributable to the country's historical job reservation policy, a more pragmatic and carefully planned programme is necessary in the fight against poverty. As part of the initiatives to redress the structural unemployment and infrastructure backlog problem through enhanced employment generation, the South African government launched the Expanded Public Works Programme (EPWP) in 2004 (Altman and Hemson, 2007:8).

With the overarching objective of *alleviating unemployment for a minimum of one million people in South Africa, of which at least 40% will be women, 30% youth and 2% disabled, between 2004 and 2009,* the purpose of the EPWP are as follows:[2]

- *Creation of at least one million temporary employment opportunities (which translates into over 500 000 person-years of employment) over the first five years.*

- *Provision of needed public goods and services using labour-intensive methods, at acceptable standards, through mainly public and public and private sector implementation capacity.*

- *Increase of earning potential of participants by providing work experience, training and information related local work opportunities, further education and training and Small, Medium, and Micro Enterprise (SMME) development.*

To achieve the above purpose, the EPWP was divided into four sectors: infrastructure, environmental, social, and economic units (Phillips, 2005:5). Table 9.1 captures targets and the planned South African government funding allocations over the first five years.

[2] McCutcheon, RT. Croswell, JA. and Taylor-Parkins, FLM. (2005). The South African National Public Works Programme and Expanded Public Works Programme with particular reference to the Infrastructure Component. *WORK 2005: Second International Conference for Employment in Development: University of the Witwatersrand, Johannesburg. September 4-9, 2005; p18*

Table 9.1. Funding allocations and targets for EPWPs first five years of operation

EPWP Sector	Funding allocation (2004- 2009) (Rands)	Work Opportunities & (average duration)	Person years of employment
Infrastructure	R15 billion	900 000 (four months)	300 000
Environmental & Cultural	R 4 billion	200 000 (twelve months)	200 000
Social	R 600 million	20 000 (twenty four months)	40 000
Economic	R80.4 million	3 000 venture learnerships – 9 000 employees (18 months)	18 000
Total	**≈ R 20 billion**	**More than 1 million**	**More than 500 000**

Source: Phillips, 2005; McCutcheon et al, 2005

Analysis of the EPWP is focused on the infrastructure component which aims at using labour-intensive methods to help alleviate unemployment and reduce poverty.

9.1.1 EPWP Labour-Intensive Infrastructure Programme

With the immediate objective of increasing the labour-absorption capacity of the construction sector via government-funded infrastructure projects, EPWP was planned by National Department of Public Works and was first piloted at Gundo Lashu in the Limpopo Province of South Africa (Phillips, 2005:10). To achieve this objective, the Gundo Lashu labour-intensive programme initiated an emerging contractor development to upgrade and maintain rural and provincial roads in 2001/2002. Apart from increased labour-absorbing capacity, the contractor development approach was implemented because the internal Public Sector capacity for construction had been dismantled in South Africa partly due to ideological reasons and inefficiencies: where there were about 17 in-house Construction Units capable of building Provincial level roads under the Old Transvaal government, currently only one unit exists (Dison, 2005).

The National government is the funding agent of EPWP, whereas the National Department of Public Works was assigned the responsibility of implementing the programme in conjunction

with several relevant stakeholders (such as Provinces, Municipalities, Local Government, CETA and its affiliates).

The Gundo Lashu programme was initiated and implemented by the Limpopo Road Agency; objectives included rehabilitation of 300-500 kilometres of rural roads at a total budget of R80 million, and generation of not less than half a million worker-days of meaningful employment (Department of Public Works, 2003:27). Twenty four contractors with more than 50% women representation were selected and trained to execute the pilot programme (Ibid). According to Department of Public Works report, each trained contractor was initially awarded one trial contract followed by a 12-month standard contract upon successful completion.

At a remuneration of R30 per task, local labour intensity employed by the contractors was significantly increased to 35% without cost overruns (compared with only 5% for conventional methods of construction). In addition, 51% employment was offered to women (Department of Public Works, 2003:27).

Serious pre-planning was done; selection criterion for trainee emerging contractors was rigorous and competitive. The contractors were given theoretical and practical training in addition to the preliminary training received under the LCU programme in Lesotho (Phillips, 2005:10; Asare, 2005:12). The LCU labour-intensive training was in the area of low-volume, rural roads rehabilitation and regravelling whereas further training under Gundo Lashu targeted innovative road sealing methods (Asare, 2005:13). As part of the practical training, contractors were given trial operations of constructing high quality pavement sealed roads (Ibid). Figures 9.1 to 9.3 illustrate standards of construction.

Figure 9.1: Cold Asphalt sealing (mix produced on site) by labour based methods on Gundo Lashu Project, Limpopo Province, South Africa.
Source: Asare, 2005.

Figure 9.2: Road works in Gundo Lashu, Limpopo Province, South Africa.
Source: Asare, 2005

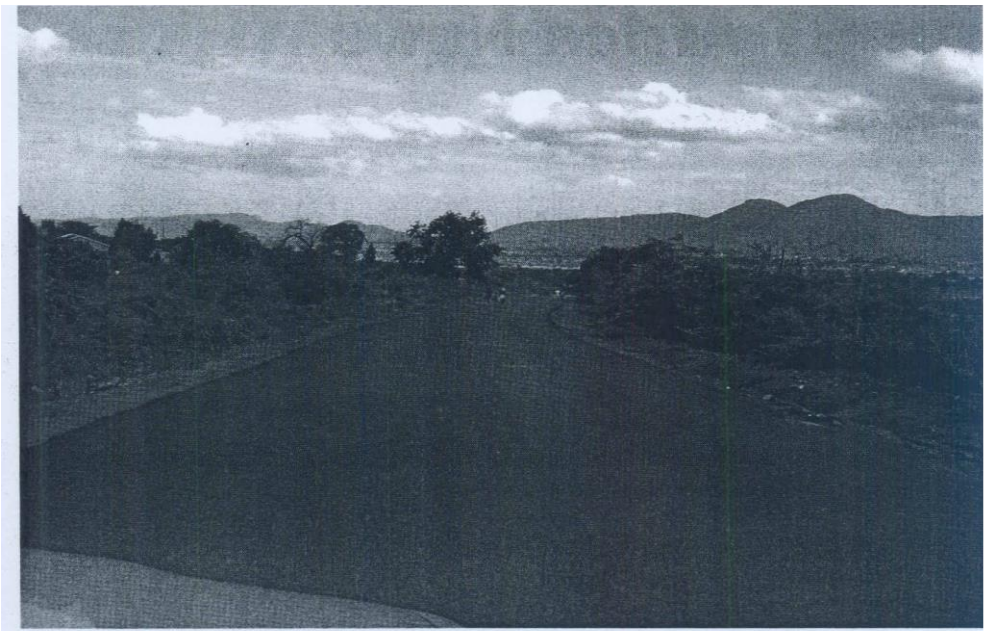


Figure 9.3: Completed section of Gundo Lashu Cold Asphalt sealing
Source: Asare, 2005

The pilot project was a great success: high quality surfaced road construction was achieved and demonstrated the cost-effectiveness of embarking on appropriate design and use of locally available resources (Asare, 2005:15). In addition to providing employment, cost comparison studies carried out by ITT (UK) and others indicated that despite the relatively high remuneration, labour-intensive methods of construction were financially competitive with conventional methods (Ibid). Factors accounting for the achievement include financial and political support, good prior preparation in terms of institutionalisation, relevant training, and close supervision.

Following the success of the pilot programme at Limpopo, the South African government decided to implement the EPWP nationwide under the responsibility of the National Department of Public Works in 2004. As indicated in Table 9.1, the original plan was to spend R3 billion annually over five years and create employment during the expansion of the Gundo Lashu pilot programme. As a short to medium–term government effort to alleviate unemployment, EPWP targets mostly the unskilled and unemployed (Public Service Commission, 2007:22). At

decentralised level, EPWP is implemented through Municipalities[3] and Provincial departments, occasionally aided by government departments and ministries and other agencies. However, the scale and pace of replication should be demand-driven and moderated by government commitment and availability of resources (including trained Provincial and Local Contract Management team and other project staff).[4]

Various labour-intensive contractor training programmes were set up, mainly in collaboration with CETA and training providers; the objective was to train emerging contractors, programme staff and consultants for the expanded programme (Phillips, 2005:8-10). In particular, contractors together with supervisors were to undergo compulsory two-year intensive training (Ibid, p10). Furthermore, the government had in place conditions for release of subsequent funds to provinces and municipalities for EPWP infrastructure projects in order to generate significant additional employment per unit of expenditure.

These included:[5]

(i) executing all low-volume roads, stormwater drains, pedestrian and cycle paths, and trenching work labour-intensively;

(ii) adherence to EPWP contract and documentation guidelines; and

(iii) compulsory training for labour and management.

The above are good policies and objectives, but have not resulted in the creation of decent jobs to reduce poverty. In terms of programme objective of employment creation, over 140 000 jobs of very short-term duration (average about 10 weeks) were generated between 2004 and 2007 (Altman and Hemson, 2007:11).

---

[3] At Municipal level EPWP is funded from the Municipal Infrastructure Grant (MIG). Likewise Provincial Infrastructure Grant (PIG) is used at Provincial level for the EPWP programme.

[4] Professor John Howe, 2006. Zibambele Road Maintenance Programme. EPWP Zibambele Workshop, 11th – 12th May 2006. KwaZulu – Natal Department of Transport; Pietermaritzburg, South Africa.

[5] McCutcheon, RT. Croswell, JA. and Taylor-Parkins, FLM. (2005). The South African National Public Works Programme and Expanded Public Works Programme with particular reference to the Infrastructure Component. *WORK 2005: Second International Conference for Employment in Development: University of the Witwatersrand, Johannesburg. September 4-9, 2005; pp 19-24*

Contemporary wage rate-productivity-inflation dynamics pose a great challenge to efficiency of labour-intensive works in South Africa. Because of a high labour wage rate, some contractors prefer using machinery for aspects such as layer works but the base-course (either water-bound or penetration Macadam design) is done labour-intensively.[6] Due consideration for economics is commendable. In particular, contractors and Municipalities should use the Cost Of Technique Analysis (COTA) model to establish what can be done labour-intensively but cost-effectively by using realistic wage rates and productivities.[7]

Despite the interventions, unemployment remains persistently high (Altman and Henson, 2007:20). This may cast a shadow over the impact of the EPWP and raises questions about the programme's employment policy and poverty reduction. Over *casualisation* of labour probably orchestrated in part by the short durations of the infrastructure projects constructed under EPWP sets a debate about the quality of employment (Ibid, pp 6, 15). The higher labour wage rates (demanded by the Trade Unions) juxtaposed the structural nature of the unemployment problem could be a significant factor to the soaring unemployment levels. As Phelps[8] (2007:5) remarked during his 2006 Nobel Prize Lecture in Economics, if the government minimum labour pay is an *incentive wage*, job rationing that translates into loss of employment prevails. This implies scrutinizing the minimum statutory pay and deciding with all major stakeholders what is financially feasible in terms of decent job opportunities. From Phelps's point of view (Phelps, 2007:19),

> *" ..... a morally acceptable economy must have enough dynamism to make work amply engaging and rewarding; and have justice ..... to secure ample inclusion."*

The programme has inadvertently raised unrealistic public expectations (McCutcheon et al, 2005:29), perhaps due to inadequate stakeholder management. However, the EPWP is not a panacea to the country's structural unemployment and poverty problem (as misunderstood and

---

[6] Personal Communication; Van Steenderen, WPC to Quainoo, HA, June 2008. Mr. Van Steenderen is a retired Eskom Civil Engineer in Private Practice; and formerly Research Fellow at Research Centre for Employment Creation in Construction, School of Civil & Environmental Engineering, University of the Witwatersrand.
[7] Ibid.
[8] Phelps, E.S. (2007). Macroeconomics for a Modern Economy. Edumnd Phelps was 2006 Nobel Prize Winner for Economics; and McVickar Professor of Political Economy and Director, Centre on Capitalisation and Society; Columbia University, USA.

misinterpreted by the public) but rather should serve as a catalyst to generating significant additional employment opportunities (Ibid, p29).

In an evaluation report on government's poverty reduction programme in relation to the EPWP, commissioned by the government, the Public Service Commission's findings state that *"..... the approach taken to the implementation of the programme has made it somewhat unwieldy to roll out and coordinate. More needs to be done to improve project definition, training and exit strategies, communication, monitoring and mainstreaming"* (Public Service Commission, 2007).

Conceptual misunderstanding of labour-intensive construction methods and resistance by EPWP stakeholders, particularly at Provincial and Municipal tiers of government, poor scope definition and lack of agreement pose serious challenges to the rolling out and mainstreaming of the programme (Ibid, pp25-26). In addition, the multiplicity of programme implementers alone has its own challenges, particularly institutional management and coordination (Ibid).

Other major challenges still confronting EPWP in its national expansion include the following:

(i) Institutional weaknesses, particularly lack of requisite organisational, administrative and technical capacities persist in several Provincial and Municipal departments (McCutcheon et al, 2005:30). According to a national survey reported by the authors above, *60% of senior management positions in the public sector were still vacant; and concluded that without a dedicated official prepared to champion labour-intensive construction, there is little likelihood that the objectives of the programme will receive due consideration* (Ibid, p36). The problem is echoed by the Public Service Commission (PSC) 2007 Report as follows (Public Service Commission, 2007):

> *".... there is little capacity in government to implement poverty reduction projects. It is recommended that Departments responsible for the implementation of these projects ensure that officials involved in the direct management of these projects are appropriately trained"*.

(ii) *Institutional barriers due to multiplicity of stakeholders across National, Provincial, Local and Non-governmental agencies.* The inability to adequately (coordinate and) manage these stakeholders often hinders programme's natural expansion rate (Altman and Hemson, 2007:21).

(iii) Inability to strike a strategic balance between decentralisation and centralisation of powers and programme control has resorted in several tiers of government often working at cross-purposes; and lack of commitment to making the labour-intensive infrastructure component achieve the original intended objectives.[9]

(iv) Lack of agreement amongst decision-makers relating to procurement policy in several municipalities has led to uneconomical acquisition of services: instead of outsourcing the work, some municipalities assume the role of contractors to execute projects (PSC, 2007:29). One explanation for the *force-account* approach is that most contractors fail to employ targeted number of people stipulated by politicians. In some instances, instead of labour-intensive method, projects have been done machine-intensively thereby defeating the very objective of increasing employment opportunities.

(v) Lack of stakeholder agreement about type of training needs and requirements for programme implementation (McCutcheon, Croswell, and Taylor-Parkins, 2005:31). The PSC evaluation report stated that in many instances, training is not provided; and where given, training has been limited to life-skills with negative consequences for product quality and future labour market (Public Service Commission, 2007: 26). A case study evaluation on seven selected EPWP projects revealed delivery problems and lots of technical inadequacies in design and quality of product due to lack of relevant training or absence of training (Ibid, pp27-30). However, according to McCutcheon et al (2005:31), the insufficient

[9] McCutcheon, RT. Croswell, JA. and Taylor-Parkins, FLM. (2005). The South African National Public Works Programme and Expanded Public Works Programme with particular reference to the Infrastructure Component. *WORK 2005: Second International Conference for Employment in Development: University of the Witwatersrand, Johannesburg. September 4-9, 2005; p36*

technical training provided for labour links to the very short project durations. Nonetheless, the PSC report concluded that where formal, relevant training was delivered, the quality of product was high (PSC, 2007:31).

(vi) Inaccurate estimations by Programme implementers are mainly due to lack of adequate lead-in time to conduct proper pre-feasibility studies to establish basic economics, technical capacity, resource requirements for the programme, and optimum conditions of employment (Ibid, pp33-34).

(vii) Absence of timely release of funding has serious time and cost overrun implications for projects under the programme, and failure to pay workers on time (Ibid, 37).

(viii) Poor quality of recording and reporting of project performance, as indicated by the Public Service Commission Report (2007:26) that *"basic project information needed to evaluate project performance and impact was found to be inadequate"*. Furthermore, PSC is deeply disturbed by the flaws and inaccuracies in the current approach for determining employment created. Consequently, it found it difficult to conclusively determine the performance of the EPWP.

Another disturbing contemporary issue is the high failure rate of emerging small contractors, reasons range from technical inadequacies to financial constraints and poor contract management.[10] Most small, emerging, contractors do not have appropriate expertise; yet are awarded contracts and are required to produce high quality products. Standardisation of technical manuals for both road contractors and supervisors is therefore necessary. The approach to construction should be *method-specification* for small contractors who have little track record for at least five years. Beyond this window period, it should be made optional to use either *method-specification* or *end-specification* to achieve the desired standard and quality of construction. On the part of the Client, EPWP field supervisors or staff should not be disproportionately

[10] McCutcheon, RT. (1989-2007). Employment Creation in Construction and Maintenance of Infrastructure lecture; 16th August 2007

overloaded with administrative duties but should be allocated enough time for effective supervision to ensure high quality control and resultant product.

The parallel economic systems in South Africa (First World and Third World elements) and labour availability also pose a serious threat to the national replication of EPWP via contracting.[11] The contracting system operates on a First World economy system often with undue pressure from the Trade Unions. However, in the Third World, the problems on the ground are related to the economy: people are therefore willing to work for less pay in comparison with statutory government minimum rates.

Moreover, the continued resistance from both the Construction Industry and the Engineering Fraternity is also a serious setback to EPWP labour-intensive infrastructure delivery. One underlying reason is the lack of understanding of labour-intensive construction methods. According to Jennings (2007), analysis shows that by virtue of their education and training and familiarity with conventional methods of construction, Engineers carry out pricing based on machine-intensive methods. Another reason probably accounting for the resistance is the poor institutional capacity for implementation. Thus, changing from in-house capacity for infrastructure delivery to contracting is a big challenge. Responsibility and economic benefits should be shared between the client and the contractors by giving incentives to perform tasks labour-intensively.

Despite the problems and challenges facing the EPWP, the programme demonstrates that with adequate planning, preparation and appropriate design, alleviation of deeply entrenched socio-economic issues is possible. However, the increasing short-term nature of employment presupposes that for critical impact on poverty, the South African government has to embark on a long term, uninterrupted, infrastructure development programme. Probably poverty alleviation should be separated from poverty reduction. As Professor John Howe recounted during the 2006 EPWP Zibambele Workshop, lessons from Nepal's effort showed that because quantity of work

[11] Personal Communication: Jennings to Quainoo, 2008. Mr. D. Jennings is a senior Engineer and Programme Director at IT Transport, UK.

was too low, poverty was not reduced but just alleviated.[12] Thus programme approach as opposed to project based approach or short-term interventions is highly recommendable in reducing poverty (McCutcheon, 2001:277-278) – since the latter can only *massage* the problem and not exert the required poverty reduction impact. Long-term or programme approach would create the necessary environment for adequate planning, preparation and sufficient but relevant training to take place.

Furthermore, given the apathy and resistance to labour-intensive construction technology and bias towards machine-intensive methods particularly amongst decision-makers at Provincial and Municipal levels, political commitment needs to be investigated. Specifically, bridging the gap between policy and implementation should be taken seriously given the negative impacts on the pace of delivery. To achieve this, a labour-intensive champion within government must be sought to ensure commitment to succeed at all levels. In addition, the champion must ascertain that policies are implementable and do have the necessary enabling environments (in terms of requisite resources and control mechanisms) before they are executed. The subsequent section therefore presents a validation model for labour-intensive infrastructure development policies.
Given the lack of commitment, apathy due to anecdotal opinions from decision-makers, and underperformance of the programme, the position of a Programme Champion becomes more paramount. This would be a senior management individual who maintains the programme vision by aligning the programme with the Department's mission statements; promotes and sustains the programme to achieve its purpose. The position provides a link between the programme management's issues on the ground and the Department directly charged with the responsibility for delivery (Archibald, 2002, Wideman, 2006). According to Wideman's definition (2004), the Champion (preferably with ten years experience in the relevant Department) should be managerially and technically astute with good interpersonal and negotiation skills. Captured in the Table 9.2 are suggested detailed responsibilities of the Programme Champion.[13]

[12] Lessons on Nepal's poverty reduction programme, by Professor John Howe, 2006. Zibambele Road Maintenance Programme. EPWP Zibambele Workshop, 11th – 12th May 2006. KwaZulu – Natal Department of Transport; Pietermaritzburg, South Africa.
[13] Wideman, Max, R. 2004. A Management Framework for Project, Program and Portfolio Integration. These responsibilities and accountabilities (slightly modified) were adapted from Wideman's website under Issues and Considerations.

Table 9.2: Proposed duties of a Programme Champion

Responsibilities	Accountability
A. ●Chair the programme's steering committee (if one exists) ●Define the business objectives of the project ●Ensure the programme remains focused on those objectives (justified in business terms & consistent with the programme updated brief) ●Ensure appropriate stakeholder involvement throughout the programme	● Clarify the programme's Term of Reference as necessary ● Chair the programme's board ● Ensure the Programme Brief are updated & visible ●Communicate sponsoring organisation's latest corporate policies, procedures and strategic direction ●Maintain awareness of internal and external environments
B. ●Ensure access to the required resources of the sponsoring organisation (facilities, land, equipment and/or materials) ●Ensure an effective team is in place ●Ensure that the programme management processes and technology method are scaled to the programme size ●Support mitigation strategies for risk avoidance ●Ensure availability and access to the programme's financing	● Convey any corporate changes or events that impact the project (whether internal or external) ● Properly delegate authority and responsibility for the programme to the programme manager ● Help identify Key Success Indicators (KSIs) by which the programme will be managed ● Ensure an appropriate programme organisational structure (to suit the programme environment, phase and manner of execution) ● Approve programme documentation, especially requirements, quality grade, schedule and budget ● Verify progress is according to plan
C. ● Keep upper management informed of programme status ● Work to remove roadblocks to progress ● Ensure delivery of the required infrastructure programme ●Resolve issues referred by programme manager ● Ensure arrangement are made to track the expected benefits ● Constantly determine the degree of programme success	● Approve (or reject) all proposed changes to scope, quality, schedule and cost ● Participate in risk reviews and mitigation strategies ● Resolve issues raised by Programme management ● Facilitate acceptance of programme deliverables ● Coordinate integration of programme's deliverable into the Department's operations ● Receive final programme report and records for archiving ● Participate in collection of benefit data and assessment

Source: Adapted from Wideman, 2004

Wideman (2004) sums up the function of the Programme Champion as follows:

> *The Programme Champion acts as the Department's 'Delegate' for the programme, representing the owner's interests and assuming the owner's project responsibilities, including funding – expenditure authority, facilitating the owner's resources, reporting project status to the owner's senior management, resolving issues, ensuring delivery of acceptable products from the project, and their transfer to the operators for harvesting the intended benefits*

9.2 Policy Workability Test for Infrastructure Development Programmes

Deriving from the analyses of the five sub-Saharan labour-intensive poverty alleviation programmes together with the South African experience, this section proposes a model for testing the effectiveness of policies for infrastructure development programmes.

Implementation of poorly crafted policy, preceded by ill-preparation, ends up being ineffective, unable to achieve programme's long term goal. The immediate resultant effect is that because it is poorly formulated, implementation, monitoring and evaluation often become difficult. This has been a major characteristic of most sub-Saharan labour-intensive programmes. Often policies are prescriptive, lack broad consultation and pre-feasibility studies, and are short of the much needed commitment to succeed. In addition, the pressure to implement infrastructure development policies without adequate assessment of resources and capability to deliver casts a shadow over the future mainstreaming of labour-intensive methods of construction. Moreover, basic underlying assumptions for successful implementation are not well-researched and validated resulting in poor risk assessment and management. Thus, prior to implementation of policies, an instrument for testing the probability of successful execution is crucial; otherwise end-results could be unsatisfactory.

Flood et al (2005: 6-12) identify crucial policy development steps like policy statement, review and ratification before actual implementation followed by monitoring. In addition, Canada School of Public Service (2004) emphasize that such a policy must be quantified to determine budgetary and time constraints. Perhaps, the inability to adequately and correctly quantify poverty reduction infrastructure interventions may partly explain the reasons for the cash flow difficulties encountered, and the ultimate collapse of subsequent employment-intensive

programmes after the initial successful ones implemented in the five sub-Saharan countries analysed. However, experience shows that in most labour-intensive programmes, either there was no concrete policy document or, where available, monitoring and evaluation are completely not considered. Consequently, several such policies fail to achieve their intended goals and objectives. Employment-intensive infrastructure programmes require several policies in order to be successful. Examples of such policies relate to the method of construction, employment, wage-setting, the rate of programme expansion from inception, programme control, monitoring and evaluation. Therefore deriving from the strengths and shortcomings of the five country-specific labour-intensive programmes examined, a five-stage testing model is proposed (Figure 9.4) which suggests there are no shortcuts to proper effective planning, contrary to political demand for quick results without adequate preparation.

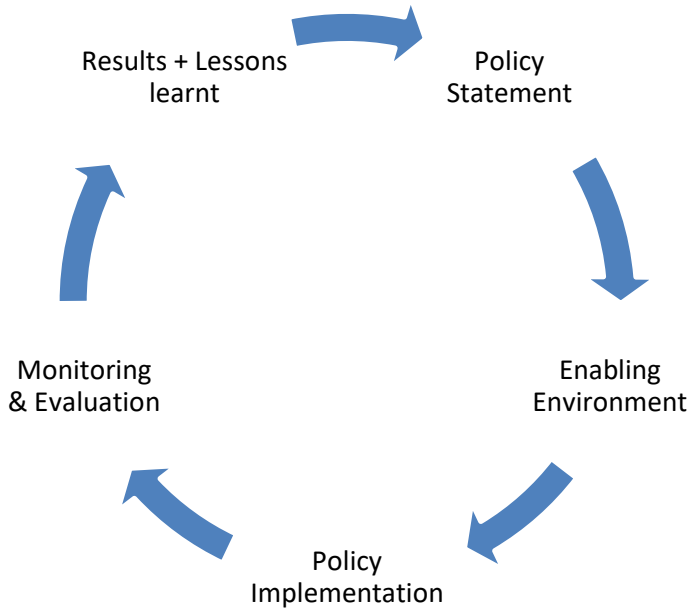


Figure 9.4: Workability Test for government policy on national infrastructure development programmes

The first stage of the test is problem identification and definition in the form of a policy statement. Inadequate problem definition has often resulted in insufficient preparation and poor implementation of infrastructure development programmes. Policies must have sound, clear objectives and should be able to command political support and commitment from all

stakeholders. In particular, the policy formulated can only proceed to step two provided issues and questions in the first stage are addressed to the satisfaction of the Client and Programme Champion. These are as follows:

- Problem statement
- Quantification (in terms of time and cost)
- Who is the client? Shareholders?
- Objective / goal
- Justification & relevance
- Critical assumption & validation
- Reporting mechanisms
- Policy ratification
- Policy review committee
- Strategic questions:
    - Is the policy statement clear, unambiguous, well-understood?
    - Is it clear and implementable?
    - It is prescriptive or well-debated with broad-based consultation?
    - Does it command widespread political support notwithstanding political affiliations?

The policy workability test should advance to stage two (creation of an enabling environment) provided issues in the first stage have been adequately addressed and strategic questions satisfactorily answered to denote good preparation.

In stage two, the creation of an enabling environment for national infrastructure development policy should attend to pertinent matters including:

- Identification of an enforcement agency
- Appropriate organisational structure[14]
- Mechanism for policy review and adjustments

[14] Note: A longer and more complex structure carries a high risk of becoming dysfunctional

- Transparency and accountability instruments
- Institutional capacity
- Programme Champion
- Motivation (resources and capability development)
- Commitment to succeed from all tiers of government and implementing departments
- Adequate time for realistic and sound planning
- Adequate political and financial support
- Policy Coordinator (and identification of key policy managers)
- (Major) stakeholder management & consensus on method of delivery
- Appropriate standardised contract documentation , conditions and specifications

Having created the necessary policy environment, effective implementation would demand examining and following good practices. Among these are:

- Capability of multi-disciplinary project team
- Establishment of Project Management Office
- Adherence to sound project management principles and good practices
- Systematised and effective contract management (and administration; supply chain management)
- Adequate control mechanisms (change management; capacity & resource management, creation of monitoring and evaluation units)

To help improve infrastructure programmes, policies must be monitored and evaluated to identify strengths and weaknesses culminating in applying the necessary corrective measures during the programme. Furthermore, the pitfalls could serve as areas for improvement in future infrastructure planning, design and implementation. Thus, during the monitoring and evaluation stage, issues worthy of consideration would include:

- Monitoring and evaluation mechanism
- Monitoring resources and capability over time to ascertain gains or losses

- Policy Review
- Reporting mechanism
- Testing of critical assumptions underlying stages one to three for validity
- Instituting corrective adjustments
- Commitment to allow natural development of the learning curve

One important question to answer by policy implementers or the implementing department is whether the development of the learning curve is not thwarted. In most infrastructure development programmes, the pilot phases are artificially controlled to yield good results or outcomes. The situation during the expansion phase, however, may be different resulting in unexpected developments often adversarial to programme outcomes. A natural and an important progression from monitoring implementing agency's capability and resources would be knowledge management. This could have a positive bearing on the skills deficit problem and the need to develop capacity for service delivery.

If an initial policy crafted is analysed using the suggested model above, from stage one through two to the end, to ensure that necessary ingredients are in place, the final result would be goal or objective-orientated policy.

CHAPTER 10: GUIDELINES FOR EVALUATION OF EMPLOYMENT-INTENSIVE INFRASTRUCTURE DEVELOPMENT PROGRAMMES

10.1 Introduction

Deriving from the strengths and weaknesses identified in the five case studies, decisions about what to evaluate and potential pitfalls culminating in guidelines for evaluating employment-intensive (poverty reduction infrastructure programmes) are crafted. This is in alignment with the principles of good employment-intensive programmes, the four-phased approach to the implementation of large-scale public works programme, and other good practices (McCutcheon, 1989-2007). The tendency for some development participants to over-emphasise the social objectives to the neglect of technical objectives is high. For example, it is commonplace to overlook maintenance in most development programmes which would be a false-economy in the long-run, and thereby rendering technical objectives secondary. However, technical objectives are equally as important as the socio-economic goals (McCutcheon and Marshall, 1998). Evaluation of most development programmes is carried out on ad-hoc basis and does not add much value to performance improvement.

Several reasons necessitate a shift from the ad-hoc evaluation practices to an institutionalised evaluation culture. First, almost all the sub-Saharan programmes encountered difficulties during recording and reporting. In particular, either there was over-reporting or lack of quality data by technical staff. Thus, time constraints regarding the ability to discharge other duties in several employment-intensive programmes were inevitable. It raises a host of questions about the evaluation exercise. Was evaluation planned at the beginning or was it an after-thought? Was there agreement about indicators of success and units of measurement? What organisational mechanism and financial arrangements were made? Studies indicate that often country-specific programme evaluations are carried out because of pressure from donors (Kusek and Rist, 2004:1-2). The immediate reaction is only to satisfy the donor, and not geared towards making an informed policy decision in the future. Similarly, programmes are either not evaluated or difficult to evaluate simply because of poorly defined objectives. In addition, the cost implications of conducting a systematic evaluation may overshadow the potential benefits to be

accrued. Secondly, the widespread corrupt procurement practices and related problems (in some of the programmes analysed) are indicative of weak financial management, absence of accountability, and no commitment to maximise potential impacts of the programme.

Developed and developing countries that have proactively embraced evaluation as a common practice have, despite the challenges, improved service delivery, public accountability and the national planning processes (MacKay, 2007:12; Castro, 2009:24-27) Safeguarding against institutional memory loss would be an immediate spin-off. Such a policy would identify evaluation as an integral component of programme planning, and make necessary arrangements and preparation for objective assessments of programme impacts based on collection of relevant agreed units of analyses. In addition, it would foster documentation of good practices and improve knowledge management in the public sector.

Institutionalising evaluation as a culture in public sector management, however, demands political-will, commitment (including commitment of resources), capacity and a programme champion (Kusek and Rist, 2004:2, 20; Castro, 2009:24-25). The latter has become very necessary for several reasons. First, the programme champion would ensure continued commitment to succeed (in terms of policy and creation of an enabling environment) from all major stakeholders. As part of suitable conditions for evaluation to be entrenched, he/she would spearhead the development of requisite evaluation capacity in various public sectors. Often lack of consensus about methods of implementation at lower tiers of government, together with disagreement about performance indicators, poses a serious threat to improving future programme design. It is therefore the work of the champion to clarify all these. One potential threat to institutionalisation of evaluation in developing countries, however, is the political cycle and selfish interests. Second, the champion would ensure timely release of money and resources for planned evaluation to take place.

Inability to state the objectives for evaluating any programme lends itself to disuse or misuse of evaluation results. Again, the problem may be traceable to lack of clear programme or project objectives and invariably absence of definitive indicators of success. Thus, the potential for evaluation with a hidden agenda (not reflective of actual performance) to please governments

could be very high. Therefore the issue of objectivity – prompting questions about who conducts the evaluation – becomes paramount. This in turn, should sufficiently interrogate framework designed to guarantee objectivity in evaluation. Of equal importance, the challenge of ensuring sufficient capacity to conduct meaningful evaluation should also be addressed. The benefits of both internal and independent evaluations should be adequately harnessed to improve upon programme design and performance.

In relation to what to measure and methodology, there is a proliferation of suggestions; it can be costly and time-consuming contingent on the purpose of evaluation and, the type and quality of information required. Notwithstanding the variations in approaches to monitoring and evaluation, there are at least six fundamental preparatory issues that underline all, namely (Kusek and Rist, 2004:27):

(i) programme immediate objectives and goals;
(ii) specification of performance indicators to measure;
(iii) documentation and comparison of existing situations before and after the programme;
(iv) setting of milestones;
(v) comparison of planned and actual performance;
(vi) analysis and presentation of results.

Whatever the approach adopted therefore, simplicity (in the wake of budgetary constraints), relevance and objectivity should form the guiding principles (IFC, 2008) for country-level evaluation of development programmes. Consequently, a simple but effective and logical means for evaluating labour-intensive infrastructure programmes would be evaluating them against programme objectives and principles of setting up successful employment-intensive, poverty alleviation programmes (McCutcheon and Marshall, 1998) taking cognisance of what worked and what did not work under previous programmes.

Furthermore, the relevance of labour-intensive programmes should be assessed in terms of both the classical definition[1] (examining technical effectiveness, economic efficiency, labour-intensity and employment created per unit of expenditure) and conditions after the intervention. All other things being equal, the impact of employment-intensive programmes on poverty reduction is possible provided a long-term approach (results of which are sustainable) is adopted. Ad-hoc short-term programmes and rotational employment policies have little impact on poverty reduction.

As a starting point, the decision to conduct evaluation should be part of programme planning and design. Early inclusion would enable fine-tuning of programme objectives, informed decision-making to categorise objectives into tangibles and intangibles with agreement about indicators of success; and what data to collect.

The succeeding subsection provides simple but informative guidelines for conducting evaluation of labour-intensive infrastructure programmes. The guidelines are built upon the following pillars:

(i) the definition and principles of employment-intensive construction;
(ii) guidelines for planning and implementing successful large-scale public sector programmes;
(iii) lessons from the five sub-Saharan labour-intensive construction experiences.

[1] Based on series of postgraduate lectures on Employment Creation in Construction and Maintenance of Physical Infrastructure delivered by Professor RT McCutcheon (1997-2007) at the School of Civil & Environmental Engineering; University of the Witwatersrand, Johannesburg, South Africa. Accordingly, *Labour – or Employment-intensive construction is the employment of as great a proportion of labour as is technically feasible – throughout the construction process, including the manufacture of materials – to produce an economically efficient product to as high a standard as demanded by the specification and allowed by the funding available. The resultant effect is creation of significant employment per unit of expenditure.*

10.2 Simple guidelines for evaluating employment-intensive programmes

Some basic assumptions underlying these guidelines are as follows:

The questions about the purpose of, or rationale behind, the evaluation, who conducts each type of evaluation (internal and independent), capacity issues, and funding arrangements for evaluation have been summarily discussed and positively concluded. The two types of evaluation may then be separated into “before” and “after” programme implementation.

10.2.1 Pre-Programme Implementation

Having established who is responsible for internal programme evaluation and having resolved the capacity issues, these generic guidelines must be adapted to suit the purpose and needs of the evaluation. The Preparatory phase for internal evaluation may go through three stages, namely (i) Programme or Project Brief Analysis; (ii) Programme plans assessment; and (iii) Collection, Analysis and Presentation of Evaluation Results. At each stage, the question of who, what, why and when must be fully established.

(i) Programme or Project Brief Analysis:

Important issues include establishing the programme parameters and readiness for evaluation. Specific issues and questions to aid the process may be as follows:

- What is the problem statement or existing situation?
- Who wants the situation changed? Who /which Department would implement the change? Who is the Programme Champion? Who is the target group? And what is the degree of participation in programme identification, implementation and operation?
- Programme Objectives at conception, and categorisation into technical, social, economic, and socio-economic. For each type of objective, what are the performance indicators and units of measurement? Who are the major

stakeholders? Have roles, responsibilities and lines of accountability been sufficiently defined and communicated? Has agreement about the performance indicators been secured from all main stakeholders?

- Scope of programme and works.
- Resource requirements and cost of programme. What are the sources and structure of funding arrangements?
- Programme duration and milestones. What is the ratio of duration of planning (feasibility and design) to projected duration for programme implementation?
- Method of construction and implementation strategy. Were they planned at conception?
- Specification: method specification or end specification?
- Form of contract envisaged and its suitability for labour-intensive construction.
- Training and development needs. Is training an integral component of the programme with specific and separate budget? Training plans detailing amongst others, the responsible institution, trainee selection, type of training, duration, funding requirements, and evaluation of (training) results.
- Employment policy direction.
- A special unit should be created responsible for programme's financial management.
- Procurement department or unit should also be created, directly accountable to the financial management unit.
- The programme should have an evaluation plan which must be well-communicated to all main stakeholders to secure an unquestionable support and commitment.
- Two different organisations need to be appointed to carry evaluations: one to undertake internal evaluation and the other to undertake independent evaluation
- Programme's critical assumptions must be stated. These must be well-researched to reflect realities on the ground.

(ii) Programme Plans Assessment:

Plans may be viewed as reference points or signposts for evaluating the effectiveness and efficiency of any intervention. Therefore good preparatory work for a labour-intensive programme should result in the production of the following documents or plans:

- Programme brief;
- Scope management;
- Stakeholder management (including community participation plan culminating in a pre-feasibility report);
- Organisational structure and communication management;
- Training and development;
- Implementation strategy;
- Scheduling management;
- Resource requirements and procurement;
- Financial management, and cost control;
- Quality control and Waste management;
- Environmental impact assessment and management;
- Contract administration and management plan (where applicable including small-emerging contractor management plan);
- Infrastructure management plan (including financial management strategy, cost recovery plan, maintenance management and demand forecasting, inventory and upgrading plans);
- (Programme) Evaluation Plan and management;
- Programme Benefit management; and
- Risk Management plan (preceded by analysis of key assumptions in all the above). In particular, the likelihood of these plans in helping to achieve programme's intended goals and objectives should be assessed.

(iii) Collection, Analysis and Presentation of Evaluation Results:

In defining roles and responsibilities, the crucial question of who collects what and timelines must be established. Other important questions include:

- Who is the user of the evaluation results?
- For what specific purpose?
- When is the overall result required?
- Who is responsible for receiving and approving evaluation results?

The above preparatory phase should set the stage for conducting a meaningful evaluation after programme implementation.

10.2.2 Post- programme implementation

This evaluation phase essentially compares the planned and actual programme performance, establishes causative factors with the implementing body and teams, and maps out ways of improving upon future programme results. A well-planned and structured post project or programme evaluation should result in the identification and documentation of both good and bad practices and suggestions for improvement. Internal evaluation should be complemented by independent assessment in order to inform future policy direction and enhance programme results.

- Internal evaluation – post implementation phase

For the purpose of internal evaluation, programme or project objectives should be delineated into technical, social, economic, financial, commercial and arguably political (to ascertain the level of political support and commitment to succeed). Under each parameter, units of measurement should be informed by the purpose of evaluation.

Table 10.1a shows a generic format for post-implementation internal evaluation. It compares programme objectives at implementation with actual achievements, accounts for the variations, and suggests the way forward.

Table 10.1a: Internal Programme Evaluation: post implementation phase

Parameter	**Original Objectives**	**Achievements** (should include the following)	**Reasons for the discrepancy, if any**	**Suggestions for improvement**
• Technical		• suitability of construction method / constructability •quantity of physical infrastructure created • quantity of asset per capita • quality of infrastructure (plus level of service)		
• Social		• number of employment created • average duration of employment • wage rate per task		
• Economic		• percentage of total programme cost that went to labour • percentage of total programme cost that went into purchase of locally available raw materials and manufactured equipment • Ratio of total employment created to total programme cost		
• Financial		•Actual total cost compared with projected cost.		
• Commercial		• cost recovery mechanism		
• Political		•level of support and commitment		

In addition to the information provided by the above Table 10.1a, the internal evaluation must document good and bad practices indentified during the programme. Table 10.1b may be used to gather such information.

Table 10.1b: Good and Bad Practices identified

Element	Detailed description	Causative factors	Effect on programme/ project	Comments (should include)
• Good Practices				Where information is stored; who owns it; and whether it is easily retrievable.
• Bad Practices				How it could have been prevented.

The essence of this table is to prevent institutional memory loss and build on good practices. The detailed description should among other things specify what was the main issue in terms of programme's cost, quality and timeframes; how it was achieved (in relation to good practices) or how it could have been pre-empted or done differently (with respect to a bad practice). The issue about who engineered the good or bad practice becomes crucially important for two reasons. First, if it was a good practice, for knowledge management and transfer, it becomes essential to trace the person who brought about the change. However, a bad practice would help to critically review performance appraisal to ascertain the quality of training on a specific programme which is tied to both funding level for training and quality of the trainer.

- Independent evaluation – post implementation phase

Steps are almost identical to that of internal evaluation. But in addition, this should compare the programme success with international literature. Moreover, it may go further to compare total employment created per unit expenditure with conventional approach. Resultant effect should be the documentation of main findings and lessons learned for future programme planning, design and improvement.

10.2.3 Programme benefit management

Benefit management may be considered a form of impact study that investigates the programme's usefulness to the target group, its sustainability, effectiveness of maintenance strategy, achievement of goals, and the spin-offs. It should be a joint-evaluation by the Programme Champion and a selected independent team. If well-engineered and executed, results could serve as an impetus to mainstream labour-intensive construction methods for sustained poverty reduction. Among other things, the study should investigate the following:

(i) Infrastructure asset inventory analysis (which should include ownership, quantity per capita, and quality of infrastructure);
(ii) Sustainability in terms of maintenance issues and cost recovery strategy;
(iii) Effectiveness, efficiency and relevance of the intervention;
(iv) Comparison of the programme with conventional construction; and
(v) Percentage contribution of the labour-intensive programme to the local, provincial, and national gross domestic product.

The foregoing discussion suggests that institutionalisation of an evaluation culture has potential advantages. Firstly, it would ensure proper accountability and minimise procurement fraud. This was one of the major problems in several programmes investigated. Secondly, it would stimulate planners to embrace adequate preparation in terms of planning and design. In particular, it would force planners and decision makers to formulate objectives that are clear and realistic with specific indicators for assessing performance. The sort of programme plans suggested (as documented above), for example, indicate that proper poverty reduction programmes through infrastructure provision require sufficient time for good preparation. Thirdly, institutionalised evaluation, supported by the necessary capacity should enable proper knowledge management and documentation of good practices. Lastly, internal evaluation, complemented by external evaluation and benefit management would assist decision makers to make sound policy adjustments for significant gains in employment creation.

CHAPTER 11: CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

The objectives of the research were four-fold, namely; (i) to describe and evaluate five large-scale development programmes implemented in Sub-Saharan Africa, and (ii) to draw out implications for South Africa as follows: (a) to identify the reasons for lack of replication of successful large-scale programmes in South Africa similar to experiences elsewhere in sub-Saharan Africa; (b) to develop policy guidelines for implementing national programmes for results in South Africa's impoverished provinces; and (c) to provide guidelines for the evaluation of employment-intensive infrastructure programmes in South Africa. Under each specific objective, a set of conclusions are drawn and their significance discussed, followed by recommendations where appropriate.

11.1.1 Description and Evaluation of the five sub-Saharan labour-intensive programmes

In Chapters Three to Seven, the five programmes and their subsequent mutations have been described and analysed in detail.

The major conclusions from the analyses of, and cross comparison between, the sub-Saharan infrastructure development programmes may be summarised as follows:

- Success of labour-intensive, poverty alleviation programmes depends largely on government commitment to succeed, adequate preparation, sufficient resources, and requisite capacity. Local or government funding is crucial to the sustainability of employment-intensive approaches to infrastructure provision. Donor funding should only be regarded as a *bonus* and not the core.

- The need for a Programme Champion for employment-intensive and poverty alleviation programmes to foster commitment to succeed needs meticulous consideration. To sustain programme momentum and vision during the initial

implementation period through expansion and decentralisation, the identification of a programme champion should be given critical consideration.

- Coherent policy and commitment to succeed are indispensable to the achievement of programme objectives and long-term goals.

- Change from force account system to contracting demands a shared responsibility. Small contractor development is complex and requires serious attention. Attempts to outsource employment-intensive road construction programmes through small-scale contracting will continue to produce mixed results unless both contractors and the clients are adequately prepared and committed to honour their contractual obligations. In particular, technical, managerial and contract administrative capacities should be strengthened to meet the new challenges resulting from changes in method of infrastructure delivery.

- Policy instruments should be made available to ensure guaranteed work, and creation of a good enabling environment, for trained small contractors to survive and accumulate requisite experience.

- Decentralisation without adequate resources and sufficient capacity at provincial, municipal and local levels ends up in programme failure. Conversely, over-centralisation of decision-making results in undue delays and increased costs in large-scale infrastructure programmes. What is required is a strategic balance between centralisation and decentralisation in decision-making.

- Evaluation must be institutionalised from inception as an integral component of every employment-intensive infrastructure programme, taking cognisance of the objectives for conducting it and the end use, for three reasons: (a) to improve future programme performance; (b) to help make informed decisions and improve policy decision regarding infrastructure development for poverty alleviation (c) to pre-empt institutional memory loss and rather build on existing knowledge. Equally, no similar future projects or programmes should be given permission to

proceed without having factored in lessons from previous programmes. In addition, recording and reporting systems and capacity should be strengthened in order to ease difficulties associated with programme evaluation and ensure systematic documentation of programme results and good practices.

The above conclusions from the five context-specific African programmes show that the success of every employment-intensive infrastructure development programme hinges on four fundamental ingredients, namely: policy, political will and commitment; adequate funding; adequate capacity and good preparation.

However, for improved programme effectiveness and efficiency of future endeavours, there are some salient shortcomings that must be addressed. As highlighted in Chapter Eight, these inter-related problems or shortcomings typically surround issues of policy, commitment, financial management, timeliness of programme expansion, capacity constraints, and institutional memory loss. For example, in some of the countries visited, even though cost per kilometre of road is on the increase, quality is on the decline. It could be attributed to lack of adequate supervision, insufficient trained technical field personnel, inappropriate succession policy and lack of knowledge management, or sheer lack of appropriate control mechanisms to curtail misconduct by certain technical and senior government staff. Analyses, in Chapters Eight and Nine, show that these problems are not unique to the five countries alone but also applicable to South Africa. Thus, in addition to adopting the good practices that emanated from the five sub-Saharan programmes, necessary steps should also be taken to prevent the shortcomings or manage the problem areas effectively.

11.1.2 Implications of the sub-Saharan experiences for South Africa

It should be possible for South Africa, taking an advantage of having its own funding compared with other African countries, to implement a successful employment-intensive, anti-poverty infrastructure development programmes provided certain fundamental preparatory principles are given serious attention. However, success, as suggested by the research findings, hinges on certain cardinal pillars: undivided and demonstrable government commitment to succeed; a

Programme Champion; well-crafted, communicated and all-binding policy at all tiers of government; an adequate preparation, contrary to fast-tracking development programmes that tends to overlook fundamental principles to succeed; institutionalisation of programmes; capacity building and training at all levels; and sufficient sustained funding. This would result in the capability to deliver large-scale employment creation programmes through the provision of infrastructure.

In each of the five sub-Saharan employment-intensive programmes, training and capacity development were sufficiently promoted to enable good programme implementation. However, as seen above, several of these programmes experienced shortcomings and encountered formidable challenges in the form of financial, and or administrative capacity constraints during the programme expansion and subsequent decentralisation. Thus, South Africa's reasons for the lack of replication of a successful large-scale employment-intensive infrastructure programmes, coupled with programme policy and evaluation as a practice, cannot be divorced from discussing the implications of the sub-Saharan programmes.

11.1.2.1 Lack of replication and proposals for improvement

A multitude of reasons accounts for the failure to implement any successful, large-scale, infrastructure development programmes for poverty alleviation. Generally, these are management-related challenges; capacity and skills deficit problem; and complex internal environment of the implementing departments – more specifically, over politicisation and political will. In relation to South Africa, specific reasons may be summarised from Chapters Two and Nine as follows:

- Despite the endemic problems of high levels of poverty, mass unemployment and general lack of employable skills, an inadequate understanding of employment generation infrastructure development programmes prevails. This translates into inadequate preparation, planning and tendency to *fast-track* development programmes. However, these interventions require sufficient lead-in time for adequate early preparation; and consequently cannot be accelerated. Research

shows, world-wide, that *fast-tracking* large-scale infrastructure development programmes is disastrous (Rogers, 2006): unable to conduct relevant training and skills development due to insufficient lead-in time; undue start-up delays and cost overruns, in addition to inability to achieve programme objectives or realise intended benefits.

- Lack of professional commitment at lower levels of government to ensure use of the tried and tested labour-intensive construction methods through proper monitoring and evaluation.

- Use of an ad-hoc, project-based approach instead of a long-term programme approach that can make positive impact on poverty, unemployment and the skill deficit problems. Project-based approach had insignificant impact on solving deeply entrenched socio-economic problems.

- Absence of realistic or appropriate policy direction for employment creation that effectively deals with the socio-economic problems. The corollary is lack of effective employment policy for tackling poverty and unemployment. The result is over-*casualisation* of labour, which only superficially addresses the problem of poverty. In addition, infrastructure development policies often fail because they are implemented without appraisal to establish the availability of requisite resources and capacity to ensure success. Thus, policies should be subjected to a workability test, and well communicated to secure commitment from all tiers of government (and programme implementers) before implementation.

- Lack of institutional and individual capacity for planning and implementing large-scale infrastructure programmes for poverty alleviation. Compounding this problem is the ill-planned succession policy in government departments. The result is inexperienced personnel without any mentor. What is required is a realistic and holistic long-term capacity development plan for every department and institution.

- Absence of a Programme Champion to ensure commitment for infrastructure development programmes to succeed.

Thus, the reasons for the lack of replication may accordingly be summarised as policy orientated, lack of commitment and capacity challenges.

In most respects, the above shortcomings applied equally to the first two years of the EPWP:

It has been marked by lack of serious planning culminating in time and cost overruns. In many instances, the requisite project management skills were lacking.

Another equally disturbing issue is the apparent lack of commitment from government officials and programme implementers. For a programme of such magnitude to succeed, commitment at all levels of government in terms of ready availability of funding and creation of the necessary enabling environment must be demonstrated.

Furthermore, there seems to be a lack of consensus about the theory and principles of employment-intensive engineering and timeframes for poverty alleviation amongst major stakeholders. Politicians want quick-fix solutions which exposes their lack of understanding. This may further be indicative of the lack of meaningful participation and competency in stakeholder management skills amongst planners and programme implementers. Again, development planners and programme implementers must secure political buy-in and commitment to succeed. What is needed is someone to champion the programme within government and the implementing Department.

Given the number of Projects in the EPWP (in excess of 10 000), the scale of expenditure and geographical scope must be treated like any serious mega-industrial project with well-documented, actionable contract management and quality management plans capable of tracking progress and workmanship. In particular, a good project brief together with project management plans (e.g. scope management plan, quality management plan, contract management plan, and risk management plan) should be produced by respective managers.

Furthermore, the high failure rate amongst emerging small-contractors who have the potential of engaging communities in productive employment is a serious drawback to replicating a successful national programme, similar to experience from other sub-Saharan countries. Together, the poor workmanship and slow pace of delivery of the EPWP may partially be attributed to the proliferation of emerging contractors who lack experience to execute public sector works. Contracts tendered were either under-priced or over-priced, a symptom of lack of understanding and inexperience. Contemporary sister issues were the budget-rollover triggered by lack of skills in the government departments. It is a phenomenon whereby budget originally released for infrastructure provision is literally carried forward to the next financial year because of inadequate capacity within some government departments to carry out the planning, design and implementation of infrastructure projects.

The above-mentioned problem does not suggest an absence of capacity in the country; rather the experienced individuals find government's policy adversarial and tend to undertake voluntary retirement. A better approach to the succession issue is the provision of attractive and satisfactory incentives that will motivate the experienced professional to train a reasonable number of successors prior to full retirement. Change of government's succession policy could usher in a new age of knowledge management whereby good practices are systematically documented and improved upon with the passage of time. Thus, management and improvement of knowledge in all government Departments and corporations, in tandem with rigorous training and development, could help alleviate the skills shortage.

11.1.2.2 Development of policy guidelines for implementing successful national programmes

Most interventions fail owing to poor planning and implementation orchestrated by ill-defined policy strategy. Consequently, in Chapter Nine, a workability test model has been designed aimed at assisting government departments to create and fine-tune the necessary environment for the implementation of employment-intensive infrastructure development policies.

11.1.2.3 Guidelines for infrastructure programme evaluation in poor provinces

Several labour-intensive programmes are not systematically evaluated because no provision is made for evaluation during the planning stage, due to lack of interest or capacity challenges. Successful management of programme outcomes and impacts warrants standardising procedures and essentially institutionalising an evaluation culture. Besides the benefits associated with evaluation, institutionalising evaluation would help in monitoring programme benefits to intended targets. Evaluation can be time-consuming and costly and therefore prohibitive, and tends to be neglected. However, it requires commitment to institute evaluation as an integral component of every national development programme. Therefore, the thesis has, in Chapter Ten, developed a simple guideline for assessing the value of interventions that would inform policy and help improve performance.

11.3 Recommendations for further research

In particular, the following recommendations should be given careful consideration:

- Current capacity development programmes: as a matter of urgency, an investigation should be launched to investigate the performance of current skills development programmes.

- Given the general lack of commitment to the use of labour-intensive construction methods, it is recommended that research to investigate its contribution to local, provincial and national Gross Domestic Product be undertaken. This could encourage decision-makers at all levels to ascertain its worth and not push it to the periphery of the national economy.

- The profile of a Programme Champion for initial implementation should be researched.

- Organisational methods for identifying subsequent Programme Champions should be investigated to ensure continued dynamism.

- Given the capacity and skills deficiencies at various levels of government, two important questions need be answered. First, how effective is the centralised EPWP Project Management Office in dealing with field management problems? Second, how effective is the current mode of decentralisation at provincial and local authority levels? Critical investigations are needed to answer the two questions raised above.

- The various contractor development programmes should be critically evaluated. If the results are contrary to expected performance, then a more workable approach should be researched and implemented.

- To help improve the performance and the currently high failure rate of emerging contractors, the selection criteria for emerging contractors should be further investigated to establish whether threshold educational standard and entrepreneurial skills are necessary.

- The practicability of an emerging contractor starting as a subcontractor to an established contractor requires investigating; with cross comparison to the current reliance upon mentoring.

REFERENCES

Abbott, J. (1994) The theory and practice of community participation in the provision of urban infrastructure. Johannesburg: University of the Witwatersrand, unpublished PhD Thesis.

Adelzadeh, A. (2007) Halving Poverty and Unemployment in South Africa: Choices for the next 10 years. *Applied Development Research Solutions.* Oxfarm, Great Britain.

African Development Bank. (2000) Botswana: Country Strategy Paper. ADB Country Department, South Region.

African Development Fund, OPEV. (2000) Lesotho: Khamane – Oxbow Road Project – Project Performance Evaluation Report. ADF/BD/WP/2000/06. 11 January 2000.

Altman, M. and Hemson, D. (2007) The Role of the Expanded Public Works Programmes in Halving Unemployment. Human Sciences Research Council.

Alyeska Pipeline Company. (2008) "The Trans-Alaska Pipeline History". Http://www.alyeska-pipe.com/Pipelinefacts. Accessed: 5th January 2009.

Amaratunga, D. and Baldry, D. (2001) Case Study methodology as a means of theory building: performance measurement in facilities management organisations. *Work Study Volume 50, Number 3, pp 95-104; MCB University Press.*

American Management Association. (2006) Handbook of Project Management: Initiation Strategies for Managing Major Projects. 2nd Edition; New York, USA.

Ampadu, S.K. and Tuffour, Y.A. (1996) A study of the field performance of selected labour-based contractors in Ghana. Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. Accra, Ghana.

Anbari et al, (undated). Case Studies in Project Management: "The *Chunnel* Project". *Project Management Institute*.
http://www.pmiteach.org/assets/chunnel_Project_FTA_Final.pdf. Accessed: 2 October, 2009

Andreski, A., Seth, S. and Walker, W. (2006) How a Road Agency Can Transform Force Account Road Maintenance to Contracting. *The World Bank Group; Transport Papers TP 11, June 2006. Washington D.C.*

Anguera, R. (2006) The Channel Tunnel: An Ex-Post Economic Evaluation. *Transportation Research Part A,* Vol.40, pp291-315.

Archibald, R.D. (2002) What CEOs Must Demand to Compete and Collaborate in 2005: unleashing the full power of project management in the internet age. 2002 Project Management Conference and Expo: Houston, TX, USA.

Asare, A.O. (2005) Innovative cost-effective approach to low-volume sealed road construction. ILO/ASIST Bulletin No. 19, June 2005.

Ashong, E.N.K. (1996) The labour-based programme in Ghana, Facts and Fugures as at December 1995, Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. Accra, Ghana.

Ashong, E.N.K. (1996) The Development of labour-based road programme involving the private sector: The Ghana experience. *Fifth ASIST Regional Seminar for Labour-based Practitioners. Labour-based Contracting: Practices and Prospects. 22-27 April 1996, Accra, Ghana.*

Ashong, E.N.K. (1996). Labour-based Road Improvement in Ghana: the development and utilization of small-scale contractors; and personal communication to the author in 2002.

Ashong, E.N.K. (1998) Labour-based Road Improvement in Ghana: Developments and the Way Forward. A proposal presented to DFID. Accra, Ghana.

Asian Development Bank Institute, ADBI. (2000) Poverty Reduction Issues. Executive Summary of Proceedings; 1-10 November 2000, ADB, Manila. Executive Summary Series No. S32/01.

Asiedu, P.K. (1996) The State of Labour-based Technology for Road Construction in Ghana. Research Report Submitted in partial fulfillment for the BSc (Eng). Degree. (Supervisor, Dr. S.K. Ampadu at UST, Ghana). University of Science and Technology, Kumasi. Ghana.

Aucoin, M.P. (1997) Tapping into the history of the Trans Alaska Pipeline. *Pipeline and Gas Journal*, June 1977; Texas, USA.

Australian Agency for International Development (AusAID). (2000) AusGUIDElines: The Logical Framework Approach. The Australian Government's Overseas Aid Program.

Austveg, B., Nkwe, T. and Ystehede, F. (1995) The 1994 Report on Gender Aspects of Botswana labour-intensive Road Construction Programme, Gaborone/Oslo; cited in Mayer W. and Kayira, GK. 1997: Addressing unemployment problems through expanding labour-based Public Works Programmes. Friedrich Ebert Stiftung, Botswana.)

Baker, J.L. (2000) Evaluating the Impact of Development Projects on Poverty. A handbook for Practitioners. The World Bank.

Bakke, N. (1996) The Maintenance Performance Budgeting System (MPBS) of the Department of Feeder Roads in Ghana. *Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. Accra, Ghana.*

Banerjee, A., Galiani, S., Levinsohn, J., McLaren, Z., and Woolard, I. (2008) Why Has Unemployment Risen in the New South Africa? *CID Working Paper No. 134* http://econ-www.mit.edu/files/2883 Accessed: 11/03/2009

Baum, W.C. (1982) The Project Cycle. World Bank, Washington D.C.

Beazley, Boenisch, and Harden, (2002) Continuity Management: Preserving Corporate Knowledge and Productivity When Employees Leave. *John Wiley and Sons* Publishers, USA.

Bellier, M. and Zhou, Y.M. (2003) Private Participation in Infrastructure in China: Issues and Recommendations for the Road, Water, and Power Sectors. World Bank Working Paper No. 2, 26057; World Bank, Washington D.C.

Bentall, P. (1999) Contracting Development – Key Issues. Labour-based Technology: A review of Current Practice: Contracting in Employment-intensive works. CTP 160: Seventh Regional Seminar for labour-based Practitioners. 3rd – 7th May 1999. ILO/ASIST, Lusaka, Zambia; pp 26-31.

Bentall, P., Beusch, A., and de Veen, J. (1999) Employment-Intensive Infrastructure Programmes: Capacity Building for Contracting in the Construction Sector. ILO, Geneva.

Berentsen, C.E. (1996) Small Scale Contractor Training Programme in Lesotho. Urban Infrastructure Development, Education and Training: Proceedings of the 5th Regional Seminar for labour-based Practitioners; 16 – 20 January 1995. ILO/ASIST, Wits University, Johannesburg, South Africa.

Bernstein, H. (Ed). (1973) Underdevelopment and Development: The Third World Today. Chaucer Press Ltd, Great Britain.

Bogetic, Z. et al (2007) Ghana's growth and Poverty Reduction Story: How to accelerate growth and achieve the millennium Development Goal Strategy. A synthesis of the Ghana country Economic Memorandum.

Botswana Institute for Development Policy Analysis, BIDPA. (1996) Study of Poverty and Poverty Alleviation in Botswana, Volume 8; Review of labour-Based Public Works, Gaborone; cited in Mayer and Kayira, 1997)

Botswana Institute for Development Policy Analysis, BIDPA. (2006) Second Quarter Briefing. Gaborone, Botswana.

Bozzoli, G.R. (1997) Forging Ahead: South Africa's Pioneering Engineers. Wits University Press, Johannesburg, South Africa.

Business Support Southern Africa. (2004) The Roads Transport Infrastructure Programme (RTIP): Interim Social Impacts of Four Upgraded Roads. EDF No. 8 ACP; LSO 002

Canada School of Public Service. (2004) *Policy Analysis in Government*; Canada. http://www.myschool-monecole.gc.ca/services/specilaists/Analys Accessed: 01/01/2007

Castro, M.F. (2009) Insider Insights: Building a Results-Based Management and Evaluation System in Columbia. The Work Bank Independent Evaluation Group, Washington, D.C.

Chernichovsky, D., Lucas, R.E.B. and Mueller, E. (1985) The Household Economy of Rural Botswana: An African Case. World Bank Staff Working Paper SW 715, Number 715.

CIA. (2008) World Fact Book: Ghana. http://www.cia.gov/library/publications/the-world-factbook/print/gh.html Accessed: 04/06/2008.

CIA. (2007) Malawi, Country Profile. http://cia.gov/library/publications/the-world-factbook Accessed: 04/06/2008

CIDB. (2007) Skills for Infrastructure delivery in South Africa: the challenge of restoring the skill pipeline. Construction Industry Development Board, South Africa.

Cleland, D.I. and Ireland, L.R. (2007) Project Management: Strategic Design and Implementation. McGraw-Hill Publishers.

Coates, P. (2001) The Trans-Alaska Pipeline's Twentieth Birthday: Commemoration, Celebration, and the Taming of the Silver Snake. *The Public Historian*, Vol. 23, No.2; pp63-86; University of California Press.

Coukis, B. (1983) Labour-based Construction Programmes – a practical guide for planning and management. World Bank document; Oxford University Press, UK.

Coulombe, H. and McKay, A. (2003) Selective Poverty Reduction in a Slow Growth Environment; Ghana in the 1990s.

Croswell, J. and McCutcheon, R.T. (2003) Team-Balancing Exercise in McCutcheon, RT and Taylor-Parkins, FLM (Editors). Employment and High Standard Infrastructure. WORK Research Centre for Employment Creation in Construction. Johannesburg.

Croswell, J. (1989) Labour-Intensive Construction at Ilinge, Republic of Transkei (now Eastern Cape), Labour-intensive Construction: practical details for success. *University of the Witwatersrand, Department of Civil Engineering, Continuing Engineering Education, 31 October to 1 November 1989*

Croswell, J. and McCutcheon, R. (2001) "Small Contractor Development and Employment – a brief survey of sub-Saharan experience in relation to civil construction". First International Conference on Employment Creation in Development. University of the Witwatersrand, Johannesburg, South Africa, 2-5 April 2001.

CTP 129. (1992) Site Visit to labour-based road projects, Lesotho. *Labour-based Technology: A review of current practice. Report of Proceedings 2 – 6 March 1992, Mohales Hoek, Lesotho. ILO, Geneva.*

DANIDA. (2000) Joint Evaluation of the Road Sub-Sector Programme in Ghana, 1996 - 2000. Policy and Operations Evaluation Department, IOB, the Hague, ISBN 87-7265 995-5

DANIDA. and IT Transport. (1997) The Minor Roads Programme – Kenya. http://www.um.dk/Publikationer/Danida/English/Evaluations/MinorRoadsProgramKenya/1997 Accessed: 10/04/2008

Danso, H. (1996) Factors influencing the output of labour-based contractors in Ghana. *Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. 22-27 April 1996. Accra, Ghana.*

Davenport, T.H. and Prusak, L. (1998) Working Knowledge: How Organisations Manage What They Know. *Harvard Business School Press,* USA.

De Veen, J. (1983) The Rural Access Roads Programme Geneva. ILO

De Veen, J. (2002) Procurement: Labour-based methods – Are they socially sustainable? *Mainstreaming employment-intensive investment strategies in infrastructure development: Procurement. ASIST/ILO, Bulletin No.14, September 2002. Employment-intensive Investment Branch (EMP/INVEST) ILO, Switzerland.*

De Vries. (2001) Performance, quality, Management: How statistical offices try to do better. Paper presented at Kuala Lumpur Seminar.

Deelen, L. and Osei-Bonsu, K. (2002) Equipment Finance for small contractors in Public Works Programmes. Working Paper No.28. ILO Geneva.

Deepak Lal. (1978) Men or Machines: A study of labour-capital substitution in road construction in The Philippines. ILO.

Department of Feeder Roads. (1990) Feeder Roads Improvement in Ghana: Contractors use labour-based Technology

Department of Feeder Roads, DFR. (2003) Roads Sub-Sector Development Programme Review – Meeting with Development Partners.

Department of Public Works. (2003) Business Plan for An Expanded Public Works Programme. July, 2003.

Department of Transport. (2005) Road Infrastructure Strategic Framework for South Africa. July 2005.

Dison, D.L. (2005) Implementation of Service Projects: (Delivery) in R McCutcheon and A Fitchett (Convenors and Editors) "Proceedings WORK 2005 Second International Conference on Employment Creation in Development: Skills, Training and Education for Employment and Development 5th to 8th September, University of the Witwatersrand." Proceedings in digital format.

Dixon, N. (1999) The organizational Learning Cycle: How we can Learn Collectively. 2nd Edition.

Dooley, L.M. (2002) Case Study Research and Theory Building. *Advances in Developing Human Resources* Vol.4, No.3, pp 335-354; Sage Publication.

Drucker, P.F. (1998) The Coming of the New Organisation. *Harvard Business Review on Knowledge Management.* Harvard Business School Press, USA.

Edmonds, G.A. (Undated) Labour Construction Unit, Lesotho: Elements of Evaluation. ILO, Geneva.

Edmonds, G.A. and Ruud, O. (1984) Labour Based Construction and Maintenance: Some Indications for Viability Geneva: ILO.

Egbeonu, E. (2004) An appraisal of mentorship within the black prime contractor component of the emerging contractor development programme of South Africa. Johannesburg: University of the Witwatersrand, MSc (Eng) Thesis.

Egner, B. (1986) The District Councils and Decentralisation 1978 – 1986. Revised Draft Final Report to SIDA.

European Conference of Ministers of Transport, ECMT. (2003) Fifty Years of Transport Policy: Success, failures and new challenges; *OECD Publications Services*, France.

Fawcett, S.L. (1985) Macro-Engineering Projects in a Free Society. *Technology In Society,* Vol.7, pp361-371. USA.

Fleming, Q.W. and Koppelman, J.M. (2002) Earned Value Management: Mitigating the Risks Associated with Construction Projects; PM: March – April 2002

Flood, V., Jackson, A. and Clift, I. (2005) Policy Development, Monitoring and Review Policy. NHS: Barnet, Enfield and Haringey Mental Health NHS Trust, UK.

Flyvbjerg B., Bruzelius, N. and Rothengatter, W. (2003) Megaprojects and Risk: An Anatomy of Ambition. Cambridge University Press.

Flyvbjerg, B. (2007) "Truth and Lies About Megaprojects". *Inaugural Speech*, September 26, 2007; Delft University of Technology, pp1-27.

Fransen, J., Scot, H.G. and Van Esch, W. (2002) Sustainable Community-managed and Labour-based upgrading of urban low-income settlements. *Handbook for Town Planners and Engineers.* ILO, Geneva

Friedman, M. (1948) A Monetary and Fiscal Framework for Economic Stability. American Economic Review, 38, pp. 245-264

Frye, I. (2006) Poverty and Unemployment in South Africa. *South Africa; National Labour & Economic Development Institute (NALEDI); January.*

Ghana Statistical Service. (1995) The Third Round Ghana Living Standards Survey September 1991 to September 1992

Gibb Sir A, and Partners. (1986) "Report on Settlement Roads" November.

Gibb, Sir A and Partners. (1984) "Rural Access Roads Gravelling and Maintenance Study Project Report" Nairobi: MoTC/Gibb, June.

Golafshani, N. (2003) Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report Volume 8, Number 4, pp 597-607*

Goss, E. and Karanja, F.D. (2005) Roads 2000 Road Maintenance Strategy in Kenya: A Case for Sustainable Financing and Resource Allocation. Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd – 7th October 2005. ILO/ASIST, Mombasa, Kenya.

Government of Ghana, National Development Planning Commission. (2006) Implementation of the Ghana Poverty Reduction Strategy: 2005 Annual Progress Report.

Government of Kenya., UNDP. and Government of Finland. (2005) Millennium Development Goals in Kenya.

Government of Kenya. (2003) Economic Recovery Strategy for Wealth and Employment Creation (2003 – 2007). Ministry of Planning and National Development.

Hagen, S. and Relf, C. (1988) The district road improvement and maintenance programme: better roads and job creation in Malawi; ILO, Geneva and World Employment Programme.

Hagen, S. (1985) Rural Access Roads Programme Kenya: Analysis of Costs and Productivities Geneva ILO April

Hauge, A. (2001) Strengthening Capacity for Monitoring and Evaluation in Uganda: A Result-Based Management Perspective. Evaluation Capacity Development Working Paper Series, No.8. The World Bank, Washington, D.C.

Heggie, I.G. (1999) Special Purpose Agencies for Managing Rural Road Networks: Ghana: The Department of Feeder Roads.

Hendrickson, C. and Au, T. (1989) Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders; Prentice Hall, USA. http://pmbook.ce.cmu.edu Accessed: 20/09/ 2007.

Holicki, O. and Tladinyane, N. (2000) Evaluation of ODA to the Infrastructure Sector Development Cooperation Report. International Organisation Development, South Africa.

Horak, E., Ras, C. and Dlamini, M. (2000) Appropriate Technology Management of Labour-intensive work in Greater Johannesburg. ILO/ASIST 1996 Regional Seminar Papers; University of the Witwatersrand, Johannesburg.

House of Commons. (2001) The Channel Tunnel Rail Link. *HC302: Session 2000-2001; National Audit Office,* London, UK.

House of Commons. (2006) The Channel Tunnel Rail Link. *House of Commons Committee of Public Accounts;* HC727: 38th Report of Session 2005-06; London, UK.

Howe, J. (1999) Sustaining Africa's Rural Road Network: The Asset Management Approach. World Bank Transport Policy Practice, Washington, D.C., 5/1, pp11-16.

Howe, J. (2001) Socio-economic impact of Rural Transport Interventions and Poverty Alleviation. Rural Travel and Transport Program, World Bank, Washington, D.C.

Howe, J. (ed.)(2001) Assessing the Impact of Transport Infrastructure on Poverty Reduction. RETA 5947: Interim (Stage1) Report.

Howe, J.D.G.F. (1995) Labour-based Road Engineering: Orientation Undergraduate/Postgraduate Course Notes. Delft:IHE/Geneva/ILO.

IFC, (2008) Monitoring and Evaluation for Business Environment Reform: A handbook for Practitioners. Prepared by IFC Advisory Services BEE Business Line in association with GTZ and DFID. Washington, D.C.

IFC/GTZ/DFID. (2008) Monitoring and Evaluation for Business Environment Reform: A Handbook for Practitioners. World Bank, Washington, D.C.

Illi, W. (1987) "Donkey Report II" (Nairobi: DANIDA / MoTC) 1987, p36

ILO. (2007) Making infrastructure employment friendly. ILO, Geneva.

ILO. (2005) Working out of poverty in Ghana: A case study of the Ghana decent work pilot programme, 2003-2004.

ILO. (2001) The Construction industry in the twenty-first century: its image, employment prospects and skills. ILO, Geneva.

ILO. (1972) Employment, Incomes and Equity- A Strategy for Increasing Productive Employment in Kenya. ILO, Geneva

IMF. (2007). Botswana: Selected Issues and Statistical Appendix. IMF Country Report Number 07/228. Washington D.C.

Islam, R., Krishnamurty, J. and Torm, N. (2005) Economic Growth, Employment and Poverty Reduction: Analysis of Linkages and a Compendium of Data. ILO, Geneva, Employment Sector.

Johannessen, B. (2000) Central Region Infrastructure Maintenance Programme (CRIMP): Contracts Management Manual. CARE Labour-Based Road Rehabilitation. Malawi, Lilongwe.

Kilby, F. (2003) Joint Statement of Development Partners for the Kenya Consultative Group Meeting: Contribution from the Roads Sector. The World Bank, Washington D.C.

Kingdom of Lesotho. (2000) Interim Poverty Reduction Strategy Paper. Ministry of Development Planning, Maseru; December 2000.

Kingdon, G. and Knight, J. (2004) Unemployment in South Africa: The Nature of the Beast. World Development 32(3):391-408

Kisii Training Centre, and Orwa, H. (2005) Roads 2000 Training Programme. Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd – 7th October 2005. ILO/ASIST, Mombasa, Kenya.

Kusek, J.Z. and Rist, R.C. (2004) Ten Steps to a Results-Based Monitoring and Evaluation System: A handbook for Development Practitioners. The World Bank, Washington, D.C.

La Verle, B. (ed.) (1994) Ghana: A country Study. Washington: GPO for the Library of Congress.

Ladd, P. (1999) DFID New Economists Guide: Appraisal of investments in improved access

Larcher, P. (2001) Case Study: A comparison of four contractor development programmes. Rural Travel and Transport Program 2001.

Lawless, A. (2005) Numbers and Needs: addressing imbalances in the civil engineering profession. SAICE, Midrand.

Lawless, A. (2007) Numbers and Needs in Local Government: addressing civil engineering – the critical profession for service delivery. SAICE, Midrand.

Lele, U. (1975) The Design of Rural Development Lessons from Africa A World Bank Research Publication. Baltimore: John Hopkins University Press.

Mackay, K. (2007) How to Build Monitoring and Evaluation Systems to Support Better Government. The World Bank, Washington, D.C.

Majeres, J. and de Veen, J. (2001) Labour Based Works Methodology. Rural Travel and)Transport Program 2001. Development Policy Department; ILO, Geneva.

Major Projects Association. (2004) The Channel Tunnel Rail Link. An MPA seminar held at the Royal College of Pathologists, London, 18 May 2004.

Malawi Roads Authority. (2008) Designated Road Network. www.ra.org.mw
Accessed: 25/11/2008.

Malawi Social Action Fund, MASAF. (2005) The People's Fund for Community Empowerment. Http://www.masaf.org Accessed: May 20, 2006.

Mambo, S. (2005) Integrated Labour-based approach for socio-economic development: Impact Monitoring and Evaluation. Proceedings of the 11th Regional Seminar for Labour-based Practitioners, Mombasa, Kenya; 2nd – 7th October 2005. ILO/ASIST, Mombasa, Kenya.

Marshall, J. (1990) The Labour Construction Unit: A Proposal for Development, Volume 1: Roads Upgrading and Maintenance Programme; CTP 107; ILO, Geneva.

Mathur, K. (1999) Road Financing and Roads Fund: Annex 10 – Management of the Road Fund in Ghana

Mayer, W. and Kayira, G.K. (1997) Addressing Unemployment Problems through Expanding Labour-based Public Works Programmes. *Botswana Development Series No.1*

McCord, A. (2003) An Overview of the Performance and Potential of Public Works Programmes in South Africa. The TIPS/DPRU Forum, September 2003; Johannesburg.

McCutcheon, RT. (1989-2007). Series of lectures delivered on Project Management in Developing Areas, and Employment Creation in Construction and Maintenance of Physical Infrastructure. *School of Civil & Environmental Engineering, University of the Witwatersrand.*

McCutcheon, R.T. (1989a) "Labour-intensive road construction in Africa", Habitat International, 13 (4): 109-123.

McCutcheon, R.T. (1989b) Kenyan Rural Access Roads Programme: Maintenance Internal Report. University of the Witwatersrand.

McCutcheon, R.T. (1989c) The Lesotho Labour Intensive Construction Unit: Contractor Development Programme. Draft

McCutcheon, R.T. (1991a) "A Strategy for Innovative and Productive Employment Creation in the Construction Industry", Managing People and Communication in Projects, Proceedings of the International Symposium of the Project Management Institute, Eskom College Midrand 21-23 February 1991 (Johannesburg: PMI, February 1991), 19.1-12.

McCutcheon, R.T. (1991b) The main findings of the district pilot project of labour-intensive road construction and maintenance in Botswana and implications for similar projects in South Africa. Development Southern Africa, Vol 8, No. 2 May 1991.

McCutcheon, R.T. (1992) "Botswana: A description of the District Roads Labour-Intensive Improvement and Maintenance Programme". Development Southern Africa, vol 9(3), August 1992, pp269-294.

McCutcheon, R.T. (1993) Employment Creation in Construction in South Africa: The Potentials and the Problems. Annual Transportation Convention.

McCutcheon, R.T. (1995) Employment Creation in Public Works: labour-intensive construction in Sub-Saharan Africa – implications for South Africa. Habitat International, 19(3).

McCutcheon, R.T. (2000) Research in labour-intensive construction and related development issues at the University of the Witwatersrand, Johannesburg. ILO/ASIST 1996 Regional Seminar Papers; University of the Witwatersrand, Johannesburg.

McCutcheon, R.T. (2001) Employment generation in public works: recent South African experience. *Construction Management and Economics;* pp 275-284

McCutcheon, R.T., Croswell, J.A. and Taylor-Parkins, F.L.M. (2005) The South African National Public Works Programme and Expanded Public Works Programme with particular reference to the Infrastructure Component. *WORK 2005: Second International Conference for Employment in Development: University of the Witwatersrand, Johannesburg. September 4-9, 2005.*

McCutcheon, R.T. and Howe, J. (1993) Labour-Based Road Engineering for Developing Countries. ILO, IHE Delft.

McCutcheon, R.T. and Marshall, J. (1998) Institution, organisation and management for large-scale, employment-intensive road construction and maintenance programmes, Construction and Development series number 15, (Midrand, Development Bank of Southern Africa)

McCutcheon, R.T. and Quainoo, H.A. (2005) "The Kenyan Rural Access Roads Programme (KRARP): 1974 to 1986: Problems and shortcomings", 20pp. in R McCutcheon and A Fitchett (Convenors and Editors) "Proceedings WORK 2005 Second International Conference on Employment Creation in Development: Skills, Training and Education for Employment and Development 5th to 8th September, University of the Witwatersrand." Proceedings in digital format.

McCutcheon, R.T., and Taylor-Parkins, F.L.M., "South Africa's Expanded Public Works Programme: a case study in government sponsored employment creation and poverty alleviation focusing upon the infrastructure component: rhetoric, reality and opportunities foregone ," 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: pp196-212.

Meredith, J.R. and Mantel, S.J. (2003) Project Management: A Managerial Approach, 5th Edition. John Wiley and Sons, Inc., USA.

Miller, N.N. (1984) The Quest for Prosperity. London: Westview Press.

Ministry of Roads and Highways, Ghana. (2001) Impact of Road Infrastructure on Ghana's Poverty Reduction Strategy: 2001 Review Report for the Road Sub-Sector Development Programme.

Ministry of Roads and Public Works. (2001a) A Study and Analysis of Existing Road Maintenance Status quo. Government of Kenya.

Ministry of Roads and Public Works. (2001b) The Roads 2000 Strategy. Republic of Kenya.

Ministry of Roads and Public Works. (2005a) Roads 2000 Contract Management Manual, Routine Maintenance: Volume 1: Management of Routine Maintenance and Level 1 Contracts. Republic of Kenya.

Ministry of Roads and Public Works. (2005b) Roads 2000 – General Training Plan. Republic of Kenya.

Ministry of Roads and Public Works & Kenya Roads Board. (2006) Roads 2000: Road Maintenance Strategy – Strategic Plan July 2005 – June 2010. Republic of Kenya.

Ministry of Roads, Public Works and Housing. (2004) Towards Cost Effective Roads Maintenance in Kenya: Enhancing use of labour-intensive Road Works in Kenya. Memo by Roads Department, Kenya.

Ministry of Works, Roads Department. (1975) "Revised Loan Application in Respect of Rural Access Roads Programme" Nairobi: MoW, July

Mintzberg, H. (1994) The Rise and Fall of Strategic Management. The Free Press. New York, N.Y. 10020

Morra, L.G. and Friedlander, A.C. (1999) Case Study Evaluations. OED Working Paper Series Number 2. The World Bank, Washington, D.C.

Morris, P.W.G. (1997) The Management of Projects. Thomas Telford Services Ltd. Thomas Telford House, London, UK.

Morrison, T. (2001) Actionable Learning: A Handbook for Capacity Building through Case Based Learning. Asian Development Bank Institute, Tokyo.

MoTC (A. Beusch). (1987) Engineers' Orientation Course Minor Roads Programme Course Notes for Participants (Nairobi: MoTC, 1987) A311.

Muatjetjeja, M. (2006) Investigation of labour-intensive Programmes in Botswana. MSc Project Report Submitted in Partial Fulfillment for the degree of MSc (Engineering), University of the Witwatersrand, Johannesburg, South Africa.

Mwangi, G. (1986) Internal Report. Nairobi: MoTC.

Ngoma, I. (2003) Impact of Labour-based Technology on Poverty Alleviation in Malawi: Case of District Road Improvement and Maintenance Programme, Malawi Social Action Fund and MW/EU Public Works Programme; Proceedings of the 10th Regional Seminar for Labour-based Practitioners, Arusha, Tanzania. 13th – 17th October 2003.

Oduro-Kwarteng. (1996) The Potential for Employment Creation in the Construction Industry in Ghana. Research Report Submitted in partial fulfillment for the BSc (Eng). Degree. University of Science and Technology, Kumasi, Ghana.

Ong, H.C. and Lenard, D. (2002) Can Private Finance Be Applied in the Provision of Housing? *FIG XXII International Congress*, Washington, D.C. USA, April 19-26, 2002.

Operations Evaluation Department. (2005) An Independent Review of World Bank Support for Capacity Building in Africa: The Case of Malawi; World Bank.

Ovretveit, J. (1998) Evaluating health interventions: an introduction to evaluation of health treatments, services, policies and organisational interventions. Buckingham: Open University Press.

Pama, C. (1999) Labour-based Works in Lesotho: Capacity Building and Development of Construction Industry. Labour-based Technology: A review of Current Practice: Contracting in Employment-intensive works. CTP 160: Seventh Regional Seminar for labour-based Practitioners. 3rd – 7th May 1999. ILO/ASIST, Lusaka, Zambia; pp 151-157

Pama, C. (2000) Labour-based works in Lesotho. ILO/ASIST, Bulletin No. 10 January 2000: Country Project News.

Paul, S. (1983) Strategic Management of development programmes: guidelines for action. ILO, Geneva.

Petts, R., Cook, J. and Tuan P.G. (2006) Rural Road Paving for Manageable Maintenance. *Revue HTE No. 134, September 2006.*

Phelps, E.S. (2007) Macroeconomics for a Modern Economy. *2006 Nobel Prize Lecture in Economics.* Nobel Foundation 2007, Feb 28.

Phillips, S. (2005) Overview of the EPWP. A paper presented at the *WORK 2005: Second International Conference for Employment in Development: University of the Witwatersrand, Johannesburg. September 4-9, 2005.*

Phillips. S.D., Pintusewitz, C.A. and McCutcheon, R.T. (1995) Choice of Technique Analysis. *ILO Regional Seminar for Labour-based Practitioners in the Road Sector in Sub-Saharan Africa; WITS University, Johannesburg, 16-20 January 1995*

Picciotto, R. and Weaving, R. (1994) "A New Project Cycle for the World Bank?" Finance and Development. December 1994.

Pollalis, S.N. (2006) Channel Tunnel Rail Link: Risk Transfer and Innovation in Project Delivery. Harvard Design School, USA.

Public Service Commission. (2007) Report on the Evaluation of Government's Poverty Reduction Programme; Republic of South Africa. Report No. 239/2007.

Reilly, J.J. (2005) Cost Estimating and Risk Management for Underground Projects. In Underground Space Use, Volume 1: Analysis of the Past and Lessons for the Future (Erdem, Y. and Solak, T. as editors); London, UK.

Relf, C., Hagen, S. and Akute, S. (1986) The District Road Improvement and Maintenance Programme of Malawi – An Evaluative Study, CTP – 74, ILO Geneva; cited in Hagen, S. and Relf, C, 1988.

Republic of Botswana. (1977) National Development Plan 1976 – 1981. Ministry of Local Finance and Development Planning, Gaborone.

Republic of Malawi. (2004) Providing Rural Transport Infrastructure. Ministry of Local Government and Rural Development in conjunction with Ministry of Transport and Public Works.

Rogers, A. (2006) Expert: Success in big Projects upfront: Alaska and Northern Canada's oil and gas industry. Petroleum News, Vol11, No. 23. http://www.petroleumnews.com Accessed : 03/19/2007

Rogerson, C.M. (2004) The Impact of the South African Government's SMME programmes: a ten-year review (1994-2003). *Development Southern Africa,*21:5, pp765-784

Rupprecht, S. (2009) "Roads to Recovery" *International Transport Forum 2009*.

Sakhalin Energy Investment Company. (2003) "The Trans Alaska Pipeline System (TAPS) and Comparisons with the Sakhalin II Pipeline Transportation System".

Sartorius, R.H. (1991) "The Logical Framework Approach to Project Design and Management". Evaluation Practice, Vol.12, No.2.

Scott Wilson Kirkpatrick. (1993) Botswana Road Maintenance Study. Carried out on behalf of *Ministry of Works, Transport and Communications, Roads Department, Gaborone*; cited in Mayer and Kayira, 1997)

Seth, S.C. (2004) Training of Small Scale Contractors for Rural Road Maintenance in Lesotho: Some lessons from Experience. *Sub-Saharan Africa Transport Policy Program* (SSATP) Note 36. World Bank, *Washington D.C.*

Siphambe, H.K. (2007) Growth and Employment Dynamics in Botswana: A Case Study of Policy Coherence. Working Paper No. 82. Policy Integration Statistics Department, ILO, Geneva.

SMEC Holdings Ltd. (2001) Mega Projects. http://www.smec.com.au/development/mega_project.htm Accessed: 3/19/2007

Stannard, C.J. (1990) Managing a Mega Project – The Channel Tunnel. *Long Range Planning*, Vol.23, No.5, Pergamon Press, UK; pp49-62

Starkey et al. (2002) Improving Rural Mobility: Options for Developing Motorized and Non-motorized Transport in Rural Areas. World Bank, Washington, D.C.

Statistics South Africa. (2008) Labour Force Survey: Historical Revision March Series 2001 to 2007. Statistical release P0210.

Stiedl, D. and Tajgman, D. (2003) Labour clauses in Public Contracts in Ghana. Recent Experience in the Roads Sector. ILO Geneva.

Stiedl, D., Danielsson, T. and Sahle, D. (1997) Labour Construction Unit, LCU, Lesotho: 19977-1996; SIDA Evaluation 97/5; Department for Infrastructure and Economic Corporation.

Stock, E. (1996) The Problems Facing labour-based Road Programmes and what to do about them: evidence from Ghana. SSATP Working Paper Number 24. ILO, Geneva

Stock, EA. (1996) The problems facing labour-based road programmes and what to do about them. *Fifth ASIST Regional Seminar for Labour-based Practitioners. Labour-based Contracting: Practices and Prospects. 22-27 April 1996, Accra, Ghana.*

Tajgman, D., and de Veen, D. (1998) Employment-intensive Infrastructure Programmes: Labour policies and practices. ILO, Geneva

Taylor, G. (1998) Cost Comparison between labour-based and equipment-based methods for roadworks: A case study from Ghana, DFID technology Development Research R6239. Rural Transport Research: sub-Saharan Africa.

Taylor, G. (1996) Force Account or Contractors? A comparison from Kenya and Ghana. *Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. Accra, Ghana*.

Thwala, W.D. (2000) "A critical evaluation of large-scale public works projects and programmes in South Africa 1980 to 1997." Johannesburg, University of the Witwatersrand, unpublished MSc (Eng) Dissertation.

Thwala, W.D. (2005) "An Independent Development Trust (IDT) Development Programmes and Projects in South Africa: Experiences and Problems" in R McCutcheon and A Fitchett (Convenors and Editors) "Proceedings WORK 2005 Second International Conference on Employment Creation in Development: Skills, Training and Education for

Employment and Development 5th to 8th September, University of the Witwatersrand." Proceedings in digital format.

Thawa, W.D. (2006) "A critical evaluation of the Independent Development Trust." Johannesburg: University of the Witwatersrand, unpublished PhD Thesis, Final Draft.

Thwala, W.D. (2007) Challenges facing labour-intensive Public Works Programmes and Projects in South Africa. *The International Journal of Construction Management* 2007: pp1-9

The Public Purpose. (1998) Infrastructure Projects Forecasts: Major Inaccuracies. Wendell Cox Consultancy, USA. http://www.publicpurpose.com. Accessed: 3/19/2007

Tokyo Tech OCW. (undated) Troubled example: The trans-Alaska pipeline system: Planning, Design and Construction (1968-1977). *Tokyo Institute of Technology Open Course Ware*, www.ocw.titech.ac.jp/index.php?module=General

Turner, R.J. (1999) The Handbook of Project Based Management, Second Edition, McGraw Hill, London, UK

Twumasi-Boakye, A. (1996) A study of labour-based contracting commissioned by the ILO. *Fifth ILO/ASIST Regional Seminar: Labour-based Contracting: Practice and prospects. Accra, Ghana*. (Mr. Alex Twumasi-Boakye, former Deputy Director of Planning at the Department of Feeder Roads)

United Nations. (2007) United Nations Assistance Framework for Lesotho: 2002 – 2007.

United Nations. (2002) Botswana: Country Profile. United Nations CP2002 – Botswana. Johannesburg Summit 2002.

United Nations Development Programme, UNDP. (2008) Human Development Reports: Botswana HDI ranking, 2007/2008 Report.

United Nations Development Programme, UNDP. (2002) Handbook on Monitoring and Evaluating for Results. New York, USA.

UNESCO. (2004) The Development of Education in Malawi. 2004 Report. Prepared for the 47th Session of the International Conference on Education: 7th – 11th September 2004. Compiled by Ministry of Education and The Malawian National Commission.

US Federal Research Division. (2007) Country Profile: Kenya, June 2007, Library of Congress.

Van Wyk, L. (2003) A Review of the South African Construction Industry Part1: Economic, Regulatory and Public Sector Capacity Influences on the Construction Industry, CSIR, BOU/1344.

Watkins, B.L; Guthrie, P.M. and Ruud, O.W. (1986) Botswana District Labour Intensive Road Improvement and Maintenance Programme: An Evaluation, ILO, Geneva.

Wideman, M.R. (2006) Managing Successful Programs (Published for the Office of Government Commerce, UK). Book Review, AEW Services, Vancouver, B.C. Canada

Wideman, M.R. (2004). A Management Framework for Project, Program and Portfolio Integration, Trafford Publishing, UK

Wideman, M. R. (2001) Project Management – Simple Answers to Simple Questions, AEW Services, Vancouver, BC, Canada. http//www.maxwideman.com/papers. Accessed: 02/08/2006.

Wilson, F. and Ramphele, M. (1989) Uprooting Poverty: the South African Challenge. Cape Town: David Philip.

World Bank. (1986a) "Kenya Project Completion Report Rural Access Roads Project; Loan 1305-KE Credit 651-KE". Washington: World Bank Transportation Division, Eastern and Southern Africa Region, Jan. 22.

World Bank. (1986b) The Study of the Substitution of Labour and Equipment in Civil Construction.

World Bank. (1993) Botswana: Opportunities for Industrial Development in Botswana: An economy in Transition. Report Number 11267-BT.

World Bank. (1994) World Development Report 1994: Infrastructure and Development. Washington, D.C.

World Bank. (1996a) The World Bank Participation Sourcebook. The World Bank, Washington, D.C. (Feb. 1996)

World Bank. (1996b) Malawi Social Action Fund Project. Staff Appraisal Report Number 15345-MAI. Human Resources Division, South Africa Department.

World Bank. (1997) Progress Report: Sub-Saharan Africa Transport Policy Program. SSATP Working Paper Number 28.

World Bank. (1998) Malawi Second Social Action Fund Project. Project Appraisal Document; Report No. 17993 MAI. Human Development 1, Country Department 3, Africa Region.

World Bank. (1999) Ghana: Building a Stronger Transportation System. World Bank Operations Evaluation Department (OED) Winter 1999 Number 198.

World Bank. (2001a) China: Overcoming Rural Poverty, World Bank, Washington, D.C.

World Bank. (2001b) Kingdom of Lesotho: Country Assistance Evaluation. Operations Evaluation Department; World Bank Report No. 23407; December 27, 2001. Washington, D.C.

World Bank. (2002) Institutional and Management Structures for Roads. Sample Terms of Reference, ToF: Improving the Management and Financing of Roads, Lesotho. Washington, D.C.

World Bank. (2003) Malawi Third Social Action Fund Project; Report No. PID 11044. Africa Regional Office.

World Bank. (2004a) Scaling up Poverty Reduction. The Shanghai Conference, May 2004. Washington, D.C.

World Bank. (2004b) Lesotho Road Rehabilitation and Maintenance Project: Implementation Completion Report (IDA – 28570), Report Number 29297; Transport Sector, Africa Region. May 25, 2004. Washington, D.C.

World Bank. (2004c) Monitoring and Evaluation: Some Tools, Methods and Approaches. Washington, D.C.

World Bank. (2004d) Botswana: Towards Prosperity for All – A Comprehensive Framework Profile. World Bank Report Number 341450B

World Bank. (2006) Lesotho Road Rehabilitation and Maintenance Project: Project Performance Assessment Report (Credit 2857-LSO), Report Number 35049-LS; Sector, Thematic, and Global Evaluation Division; Independent Evaluation Group. January 25, 2006. Washington, D.C.

World Bank. (2007a) International Program for Development Evaluation Training – 2007: IPDET Handbook.

World Bank. (2007b) Country Assistance Strategy Progress Report for the Republic of Kenya for the period FY04-08. Report No. 38055-KE.

World Bank. (2008) Country Brief – Kenya. http://www.worldbank.org/Kenya Accessed: 20/10/2008.

World Factbook. (2006) Kenya. http://education.yahoo.com/reference/factbook/ke.html Accessed: 04/08/2006.

Yin, R. K. (1994) Case Study Research: Design and Methods: Applied Social Research Methods Series, Volume 5, Second Edition. Thousands Oaks, CA, USA.

Personal Communications

Abban, R.J. (2002) Personal Communication. Ghana Feeder Roads Programme; Accra, Ghana.

Ampadu, S. (2002) Personal Communication. Department of Civil Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Ashong, E.N.K (2002) Personal Communication. Ghana Feeder Roads Programme; Accra, Ghana.

Bradbury, T. (2002) Personal Communication. DFID, Ghana.

Chagunda, J. (2007) Personal Communication. Malawi Rural Travel and Transport Program. Lilongwe, Malawi.

Danso, H. (2002) Personal Communication. Ghana Feeder Roads Programme; Accra, Ghana.

Dison, D.L. (2008) Personal Communication. Wits University, Johannesburg, South Africa

Gitau, S. (2006) Senior Superintending Engineer, Ministry of Roads & Public Works, Nairobi

Goss, E. (2006) (seconded from DANIDA), Roads 2000 Technical Advisor, Kenya Roads Board, Nairobi

Jennings, D. (2006, 2007) Personal Communications. IT Transport, UK.

Karanja, F.D. (2006) Personal Communication. Ministry of Roads and Public Works, Nairobi, Kenya.

Kumwenda, H. (2007) Personal Communication. Ministry of Local Government and Development; Lilongwe, Malawi.

Lwanda, A.O. (2007) Personal Communication. Malawi Rural Travel and Transport Program. Lilongwe, Malawi.

Muatjetjeja, M. (2007) Personal Communication. University of Botswana; Gaborone, Botswana.

Muthua, S. (2006) Personal Communication. ILO Office in Kenya; Nairobi, Kenya.

Mwale, M.K.M. (2007) Personal Communication. Ministry of Transport, Public Works and Housing; Lilongwe, Malawi.

Ntoi, M. (2007) Personal Communication. Lesotho Labour-intensive Construction Unit; Maseru, Lesotho.