

Mission Report

Developing Labour-based Small-scale Contracting in Dedza and Lilongwe

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for



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Central Region Infrastructure Maintenance Programme

Lilongwe, May 2000

ABBREVIATIONS

ADT	Average Daily Traffic
ASIST	Advisory Support, Information Services and Training, (ILO)
CA	Contractor Association
CARE	Cooperative for Assistance and Relief Everywhere
CRIMP	Central Region Infrastructure Maintenance Programme
DA	District Assembly
DDC	District Development Committee
DDF	District Development Fund
DDO	District Development Officer
DfID	Department for International Development (United Kingdom)
DRIMP	District Roads Improvement and Maintenance Project
EU	European Union
FFW	Food for Work
GoM	Government of Malawi
GTZ	Gesellschaft fur Technische Zusammenarbeit (Germany)
ILO	International Labour Organisation
KfW	Kreditanstalt fur Wiederaufbau (Germany)
MASAF	Malawi Social Action Fund
MoAI	Ministry of Agriculture and Irrigation
MoLGRD	Ministry of Local Government and Rural Development
MoWS	Ministry of Works and Supplies
MoTPW	Ministry of Transport and Public Works (new name after merging Ministry of Transport with MoWS)
MRTTP	Malawi Rural Transport and Travel Programme
NCIC	National Construction Industry Council
MK	Malawi Kwacha
NGO	Non-governmental organisation
NRA	National Roads Authority
RMI	Road Maintenance Initiative
SSCC	Small-scale Community Contractor
TA	Traditional Authority
TOR	Terms of Reference
UNDP	United Nations Development Programme
VARBAU	Village Access Roads and Bridges Assistance Units
VDC	Village Development Committee
WB	World Bank

Current Exchange Rate

US\$ 1.00 = MK 47.00 (Commercial bank rate)

Executive Summary

Project Context

CARE International in Malawi has received funding from the Department for International Development (DfID) for the Central Region Infrastructure Maintenance Programme (CRIMP) to be implemented in Lilongwe and Dedza Districts. Its purpose is to develop systems for sustainable and cost effective rural feeder road rehabilitation and maintenance that directly contribute to improved household livelihood security in selected Traditional Authorities in the Central Region of Malawi.

In the past, the force account model has been the general mode of implementation adopted by the road authorities in Malawi, whereby as a public agency, it carried out all aspects of construction, supervision, management, as well as the control of equipment, materials and labour. The establishment of a cadre of independently operating local contractors, engaged by the district authorities to maintain and rehabilitate rural feeder roads, is one means of contributing to the implementation of the reforms currently taking place in the road sector today.

The Road Sector

Due to a major restructuring of the road sector of Malawi, the authorities in charge of the road network are currently in a transitional stage where a number of key management and organisational issues remains to be resolved.

In the past, the responsibility for rehabilitation and maintenance of roads was vested in the Ministry of Works and Supplies (MoWS) with its offices at regional and district level. With the creation of the National Roads Authority, the Ministry's involvement in the road sector is currently being phased out. The NRA is still in its infancy, with only parts of its organisation so far established at central level.

As part of this reorganisation the government has disbanded most of its force account operations in MoWS, and instead relies mostly on the private construction industry to execute road rehabilitation and maintenance works.

As part of the new decentralisation policies of the government, the District Assemblies have been assigned the responsibility of the construction, rehabilitation and maintenance of roads not under central government, including:

- district roads,
- township roads,
- city roads and
- estate roads.

Road Works Implementation Capacity

Currently the main road works implementation capacity lies with the NRA in terms of planning and management, relying on private contractors for works execution and consulting engineers for contracts management and supervision.

As a temporary measure, the NRA and the district authorities utilise the services of the remaining field organisation of the Ministry of Works for planning and supervision of rural road maintenance and rehabilitation works. The district offices of MoWS are still manned with one or two Road Supervisors.

Although these road supervisors have long and solid work experience in rural road construction and maintenance, it should be acknowledged that they possess limited resources in terms of meeting the demand for an extensive road works programme in their respective districts. In most cases, they lack transport, they have limited budgets for travel allowances and are not equipped with modern office facilities required for the effective management of a comprehensive road works programme.

Outputs and Strategy

The programme will achieve the following three outputs as a means to contributing towards the programme purpose:

- (i) effective community based contract associations (CA) established, maintaining 800 km of rural feeder roads,
- (ii) improved skills and confidence amongst CA members to manage resources and generate income that improve their livelihoods, and
- (iii) effective small-scale community contractors (SSCC) established for the rehabilitation of 150 km of rural roads.

The project intends to achieve the physical outputs through the engagement of emerging small-scale contractors and petty contractors trained in the use of labour-based road works technology.

When involving the domestic private sector in the execution of labour-based road works, there are several important issues which need proper attention during programme design and implementation. Local contractors will not provide an easy solution to road rehabilitation and maintenance problems. The development of small-scale contractors entails a series of new activities such as training in business management, development of user-targeted training material, development of appropriate contract procedures, streamlining of payment procedures and last but not least providing interested contracting firms with attractive market prospects and a conducive environment in which they can operate efficiently.

The size of the contracting firms is important when identifying and selecting appropriate contractors for a specific type of work. The optimal solution is to target contractors who would use labour-based methods as a main source of livelihood.

A common feature for these types of "firms" is that they are not formally registered. They do not possess any capital and are therefore extremely vulnerable to cash-flow distortions such as late payments. Most of these contractors do not operate their accounts through a bank.

After receiving appropriate training development assistance, these contractors can prove to be highly efficient in carrying out both road rehabilitation and maintenance works. Some show

good entrepreneurial drive, and given favourable conditions for their operation, such as a steady supply of work and regular and timely payment, they can survive as sound construction firms and constitute an important component of the domestic construction industry.

The Ministry of Works and its district organisations, due to its history of force account works, have been developed as road works implementors. With the shift to the use of the local construction industry, their future role and responsibilities will change dramatically. In order to ensure that the government efficiently takes on its new role as contract managers, there are a number of activities which needs to take place:

- Contracts management is a new field of responsibilities for the district staff. Efficient management procedures need to be established within the organisation which allow for contractors to operate.
- Since most labour-based road works have previously been carried out through force account procedures, appropriate contract documentation needs to be prepared for this specific type of work and technology.
- As compared to force account operations, works need to be properly documented in advance when using contractors. Existing planning procedures need to be carefully reviewed and further strengthened.
- Finally, when the above measures have been carried out, it is important that all members of the contracts management organisation are properly trained in carrying out their new roles and responsibilities.

Implementation

The general conditions of a civil works contract normally define the roles and responsibilities of three basic parties. Contract agreements are entered into between a Client, i.e. the owner of the assets to be created and a contracting firm, the executor of the works. In addition, the works are normally supervised and verified by a third party, the Engineer.

The Client

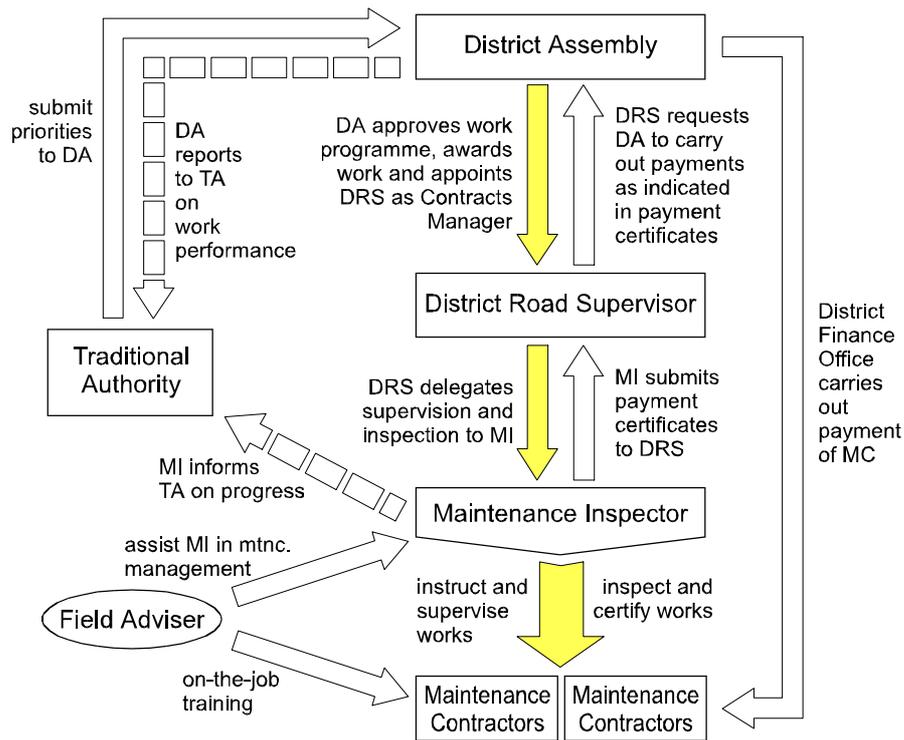
The responsibility of the road network, not under the command of NRA, including district roads lies with the District Assemblies. Any improvement or maintenance works carried out on these roads, would in principle therefore be based on initiatives from the District Assemblies.

The Engineer

In terms of implementing works, the Client often chooses to delegate these responsibilities to a third party, the Engineer (also referred to as the Contracts Administrator). Particularly in situations where the work is dispersed over a large geographical area, it would seem natural for the Client to choose an institution which is well represented at local level.

Since the MoWS is currently the only institution represented at local level, with a certain amount of technical experience in this field, it would be logical to use their resources to cover the responsibilities of the Engineer.

The management of routine maintenance works could therefore be organised as proposed in the figure below:



The Contractors

The type of road works envisaged to be carried out can be grouped into two main categories according to the size of works, requiring contractors with two different profiles:

- small-scale contractors carrying out new construction and periodic maintenance of rural roads, and
- petty contractors providing routine maintenance organised similar to a lengthman system.

For the rehabilitation works, each contractor should ideally possess the services of an overseer in his/her management team for the technical supervision and management of the works. In addition, it is envisaged that the contractor him/herself will also be operating as a supervisor on site. For the direct supervision of labour, the contractor will need to recruit an appropriate number of gangleaders.

For the petty contractors carrying out routine maintenance, the structure of the firms will be far simpler, basically consisting of one person acting as a representative for the other association members. The CA representative would be expected to take part in the physical works in line with the other workers, in addition to carrying out the supervisory duties and dealing with contractual issues (i.e. receiving instructions from the maintenance inspector, measurement and payment, responsible for tools, etc.).

Planning, Design and Contracts Preparation

With the physical work programme envisaged in the CRIMP over the next two years, it is clear that the district road supervisors will not be able to adequately cover the planning, design and contracts preparation activities in addition to contracts supervision of the CRIMP road works programme. The only immediate solution to this seems to be that the CRIMP technical staff plays a gap-filling role to meet the personnel requirements of these activities.

Routine Road Maintenance

Traditionally, routine road maintenance has been organised according to the lengthman system, which is based on assigning one person to take care of a road section of approximately 1 km. The lengthman system has proven effective also in Malawi, however, one of its drawbacks is that it requires intensive supervision.

One way of solving the issue of effective supervision is to introduce petty contractors, basically consisting of a group of lengthmen which are assigned to a longer road section (5 to 15 km). The use of petty contractors reduces administrative procedures, as well as delegating direct supervision of individual workers to the contractor.

Road Rehabilitation Works

As compared to the routine maintenance works, the contracts management system for the rehabilitation works needs to follow a more comprehensive system, using commonly accepted procedures and principles for contracting.

After an initial period where contracts are offered with fixed unit prices, works should eventually be awarded on the basis of bids submitted from pre-qualified contracting firms.

Ideally, the contract preparation, and prior to this stage the planning and prioritisation of the road works, should be carried out by the district authorities. Since there is still no technical staff available within the District Assemblies to provide such functions and services, it is recommended that these responsibilities are left with the district road supervisors with the assistance of the CRIMP technical staff.

The process of announcement of bids, bid opening, bid evaluation, award of contract, inspection and supervision of works, certification and payment of works and finally issue of final completion certificates for rural road works contracts should also be carried out by the district road supervisors with the assistance of the CRIMP technical staff.

Technical Issues

As Malawi was one of the first countries in this region to commence on district road construction and maintenance using labour-based work methods, this technology has already been developed to high standards. The work methods applied in the CRIMP should to the extent possible follow established practice in the country. This way, the project may benefit from the wealth of experience which has been accumulated in existing technical manuals and training material as well as the skills acquired by government technical staff which has been working with the various labour-based road works schemes in Malawi.

It is expected that the project will also be carrying out rehabilitation and maintenance works on roads which do not belong to the gazetted network. These roads have been built using a number of different design standards which are not necessarily documented in any of the established technical manuals and training material.

On low-volume roads it will be important to keep the road design standards appropriate to the expected type and volume of traffic thereby not only limiting the rehabilitation works but also keeping future maintenance requirements at a minimum.

Contract Documents

The contract documents need to cover the basis essentials in appropriate detail to the size and complexity of the works to be undertaken. The proposed contracts management procedures consist of two distinct packages, one covering the routine maintenance works and the other covering the road rehabilitation works.

Routine maintenance contracts are the smallest contracts envisaged in this programme. They will be of limited value and consist of simple works activities which will require a minimum of equipment and technical skills. However, due to their large number and wide geographical coverage, it is important that the management procedures are simple and efficient, thus reducing the administrative requirements to a minimum.

Although the road rehabilitation works should follow common practice in terms of contract procedures, there are a number of aspects in standard conditions of contract which can be omitted, considering the type and size of the contracts.

For rural road rehabilitation contracts:

- the need for initial capital is minimal,
- value of the projects is not large, nor are they complex,
- sectional completion of works is achieved, thus the Client has use of the facility as it progresses,
- work can easily be taken over by another contractor if one contractor defaults, since the costs and efforts related to mobilisation are minimal and can be carried out very quickly.

For the above reasons bonds, guarantees, advance payments and liquidated damages are not required.

A vital performance criteria of the contracts management procedures is that the contractors are paid within a maximum of one to two weeks after works have been inspected. Further delay will compromise the contractor's ability to pay the workers, which in the next turn will have a detrimental effect on the job motivation of the labour force and finally lead to reduced production rates.

Training

Training for the road maintenance component should concentrate on the staff in charge of maintenance planning, supervision and inspection. Training of the petty contractors engaged for this work should be limited to on-the-job training with an emphasis on appropriate work methods.

For the rehabilitation works, training needs to cover three distinct topics:

- (i) road works technology,
- (ii) contracts management and
- (iii) business management.

The technical part of the training of road rehabilitation contractors should follow a similar setup as the training which were provided to the supervisory staff on past force account operations where labour-based work methods were applied.

Contracts management training needs to be provided to both the contractors as well as the staff carrying out the role of the Engineer. This will include subjects such as estimating and tendering, bidding procedures, tender evaluation, conditions of contract, supervision, measurement and payment.

Business management training should be provided to the emerging small-scale contractors. This should include subjects as book keeping, profits, budgeting, use of bank services, cash flow planning, banking, labour regulations.

Training could be provided by the MoTPW Training Centre. This institution has a long tradition and experience in appropriate rural road works technology, and it is well equipped to carry out the required training courses. In addition, it would be preferable if the District Road Supervisors are utilised as resource persons during practical field training.

The training programme should focus on practical skill training in the expected work environment of all the involved parties. For the rehabilitation works, the programme envisaged consist of two phases:

- (i) the **Training/Demonstration Phase** consisting of formal class-room training combined with a substantial portion of practical field exercises. Preferably, the field exercises should be carried out on a full-scale demonstration site
- (ii) After the formal training phase the contractors are awarded a **First Trial Contract** which is executed under close guidance of the project technical personnel and the instructors.

Once the contractors have successfully completed this training they should be registered and classified as labour-based road rehabilitation contractors.

Chapter 1

The Assignment

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1.1 Project Context

CARE International in Malawi has received funding from the Department for International Development (DfID) for the Central Region Infrastructure Maintenance Programme (CRIMP) to be implemented in Lilongwe and Dedza Districts. Its purpose is to develop systems for sustainable and cost effective rural feeder road rehabilitation and maintenance that directly contribute to improved household livelihood security in selected Traditional Authorities in the Central Region of Malawi. The project aims to pilot the development of a network of small-scale contractors and develop a sustainable system for rural road works that is both cost effective and efficient.

In the past the force account model has been the general model adopted by most local authorities in Malawi, whereby, as a public agency, it carried out all aspects of construction, supervision, management, as well as the control of equipment, materials, and labour. The establishment of a cadre of independently operating local contractors, engaged by the district road authority to maintain and rehabilitate rural feeder roads, is one means of contributing to the implementation of the reforms currently taking place in the road sector today. An approach that focuses on the development, and use of, local contractors aims to strengthen the capacity of the district road authority in its new role as contract manager, with responsibilities for the tendering, supervision and certification of roadworks. The end result will be a district road authority that is able to devote more energy to the quality of road maintenance and rehabilitation with greater overall output.

Working closely with the National Road Authority, Ministry of Local Government, the district road authorities and the National Construction Industry Council, CARE will assist with the identification, training and mobilisation of emerging small-scale contractors. These "firms" will be trained alongside district level supervisory staff in labour-based rural road maintenance and rehabilitation skills.

1.2 The Mission

The purpose of this consultancy was to provide appropriate curriculum development, training and contract management development which will enable emerging labour-based small-scale contractors to implement road maintenance and rehabilitation works.

The assignment was carried out by Bjørn Johannessen from 13 March to 6 May 2000. During that time, discussions were held with key personnel involved with this programme, including government line ministries, donors and private sector organisations involved in rural infrastructure development, and government representatives operating at both central and local level. Field visits were carried out to rural areas to assess planned works. The bar chart below summarises the activities carried out during the assignment. A more detailed overview of the consultant's itinerary is provided in Annex 2, with a list of persons met in Annex 3.

Activity	Month Week	Mar			Apr			May	
		1	2	3	4	5	6	7	8
Review of current situation, meetings with key players and propose mode of implementation		■	■						
Present initial findings to project participants				■					
Develop appropriate contract documentation and management procedures				■	■				
Present contracts management system and submit draft contract management manuals						■			
Prepare training programme and training materials					■	■	■		
Conduct Training of Trainers Course							■	■	■
Final presentation of findings and progress									■

Three major events were arranged during the visit of the consultant:

- (i) An information seminar was arranged on 27 March 2000, during which the various key players in this project were presented with the preliminary findings of the consultant and the proposed model of implementation. The participants to this meeting consisted of staff from MASAF, MRTTP, NRA, MoTPW, the MoTPW Training Centre, NCIC, the district authorities in Lilongwe and Dedza, Local Government and technical staff from the project.
- (ii) A second meeting with the same participants was arranged on 13 April 2000 to present the contract management system designed by the consultant.
- (iii) During a two week training of trainers workshop, the future training requirements for the project were prepared. This training workshop also included a review of labour-based road works technology, contracts management as developed for this programme, and the envisaged routine maintenance system. The detailed programme and list of participants are included as Annex 5 to this report.

1.3 Contents of Report

This report attempts to summarise the results and findings of the assignment. Chapter 2 provides brief description of the major key players in the road sector of Malawi and their relevance to the CRIMP. Chapter 3 lists the objectives of the project and the strategy of using labour-based technology and small-scale contractors. The implementation model with the roles and responsibilities of the various parties involved in the programme is summarised in Chapter 4. Chapter 5 provides the rationale behind the final preparation of the contracts

documents. Some technical and managerial aspects are discussed in Chapter 6. The training of trainers workshop and the proposed contractor training are described in Chapter 7. Finally, Chapter 8 outlines some of the project activities required in the near future before the road works can commence.

Further details relating to the mode of implementation of project activities are found in the manuals and training material produced by the consultant during this mission. These documents are:

- Contracts Management Manual - Labour-based Road Rehabilitation,
and
- Rural Road Maintenance Management Manual.

Finally, an attempt has been made to list of some relevant literature in Annex 4 which may be of relevance to the CRIMP staff and their collaborating partners. All of these documents provided valuable reference material during the conduct of this assignment.

1.4 Acknowledgments

The consultant would like to express his appreciation of the open and frank discussions that he was able to have with both government officials and the representatives of the project. In particular, the consultant was impressed by the support provided by the staff of Care Malawi and the MoTPW Training Centre.

Whilst every effort has been made to reflect the views of the various actors in the programme, the views expressed in this report are those of the consultant and do not necessarily represent those of the government of Care Malawi.

Chapter 2

Current Situation

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2.1 The Road Sector

The length of the gazetted road network in Malawi amounts to 15,300 km of which 3,203 km are paved. The total length of the non-gazetted road network is estimated at approximately 10,000 km. Estimates are that presently less than 20% of the paved roads and less than 11% of the designated gravel and earth roads are in good condition, with only about 50% of the designated unpaved roads open all the year round. The condition of non-gazetted rural roads are expected to be far worse as the sub-sector is constrained by limited funding and a lack of capacity and trained personnel combined with a centralised management of work operations.

Due to a major restructuring of the road sector of Malawi, the authorities in charge of the road network are currently in a transitional stage where a number of key management and organisational issues remains to be resolved.

In the past, the responsibility for rehabilitation and maintenance of roads was vested in the Ministry of Works and Supplies (MoWS) with its offices at regional and district level. With the creation of the National Roads Authority, the Ministry's involvement in the road sector is currently being phased out. The NRA is still in its infancy, with only parts of its organisation so far established at central level. The chief executives were recruited in February 1999 and its 10 Project Engineers in May 1999.

As part of this reorganisation the government has disbanded most of its force account operations in MoWS, and instead relies mostly on the private construction industry to execute road rehabilitation and maintenance works. Furthermore, construction management and supervision is currently carried out by private engineering firms, leaving the NRA mainly with the role of a funding and planning agency.

2.2 Decentralisation

The NRA is in charge of the gazetted road network in the country. This includes the main, secondary, tertiary and district roads. However, as part of the new decentralisation policies of the government, the District Assemblies have been assigned the responsibility of the construction, rehabilitation and maintenance of roads not under central government, including:

- district roads,
- township roads,
- city roads and
- estate roads.

The revenue sources financing this work will be from (i) the traditional locally generated revenues and (ii) central government revenues ceded to the District Assemblies from sources such as the fuel levy and motor vehicle registration fees. It is intended that 5% of the national revenues, excluding grants will be made available to District Assemblies to be used for infrastructure development in the districts¹.

The Decentralisation Act was published in December 1998, however, in terms of road works the required resources to implement the new responsibilities at district level have not been put in place. This implies that currently the NRA is in effect the only road works agency in the country, with the exception of programmes such as MASAF and WFP Food for Works.

2.3 Road Works Implementation Capacity

Currently the main road works implementation capacity lies with the NRA in terms of planning and management, relying on private contractors for works execution and consulting engineers for contracts management and supervision.

As yet, there is very limited management capacity at regional level and district level as this remains to be established within the new road authority. NRA intends to establish five zonal offices, which will be headed by a civil engineer and also plans to establish an office in each of the districts headed by a technician.

As a temporary measure, the NRA to some extent utilises the services of the remaining field organisation of the Ministry of Works for road condition surveys and road maintenance planning. At district level there is still a limited road works capacity available through the district offices of the Ministry of Works. These are in most cases manned with one or two road supervisors.

Although these supervisors have long and solid work experience in rural road construction and maintenance, they possess limited resources in terms of meeting the demand for an extensive road works programme in their respective districts. In most cases they lack transport, they have limited budgets for travel allowances and are not equipped with modern office facilities required for the effective management of a comprehensive road works programme.

It should also be acknowledged that the MoWS district organisation was originally set up as a force account operation. With the current trend of relying on the private construction industry for the execution of works, there is a demand for training the district staff in its new role as contract managers.

Finally, it is worth mentioning that the existing district organisation is a temporary one, and that the future solutions to the field organisation of the road authorities of Malawi remain to

¹ Ref: Malawi Decentralization Policy

be clarified. At the moment, the division of future authority, function and responsibilities between the NRA and the District Assemblies in terms of rural road maintenance and rehabilitation works is unclear.

2.4 National Construction Industry Council

In 1996, the total number of registered firms in civil construction was 71, of which 46 were of Malawian origin. All of the latter are registered in the lowest category of work - up to MK 2 million. Total annual capacity of indigenous Malawian firms to undertake road works was then estimated and MK 60 million (US\$ 1.3 million).

As a further measure to strengthen the role of the domestic contractors, the government passed the National Construction Industry Act in 1996 to: *"...provide for the establishment of the National Construction Industry Council of Malawi, for the promotion and development of the construction industry in Malawi, for the registration of persons engaged in the construction industry, for the coordination of training of persons engaged in the construction industry..."*².

Furthermore, the Act empowers the NCIC to standardise quality control, contract documentation, codes of practice, procurement processes, legal and contractual procedures in liaison with other organisations.

The government expects that the NCIC will take a lead role in the field of capacity building and training of the domestic construction industry. At the moment, the NCIC in collaboration with the MoWS Training Centre, is providing training courses in rural road construction, including the use of labour-based work methods.

Finally, it is important to note that the Act prescribes that before a person carries out business in the construction sector, they need to be registered with the NCIC. Any person who contravenes this shall be guilty of an offence and liable to fines and imprisonment. In other words, all contractors involved in the CRIMP project will need to be registered by the NCIC.

2.5 Malawi Rural Travel and Transport Programme

With World Bank funding, the Government has established a rural travel and transport programme in order to gain recognition of this component of its transport sector. The goal of the MRTTP is to contribute to poverty reduction through the improvement of accessibility to socio-economic goods, services and facilities by rural communities. The MRTTP has been involved in including appropriate considerations of rural transport in the national transport policy and are currently following up this with a several activities to raise awareness and stimulate investment in this sector.

One of these activities will be the promotion of the use of integrated rural accessibility planning. Another activity which will be of direct interest of the CRIMP is the MRTTP initiative to standardise designs of rural transport infrastructure such as rural roads, tracks, footbridges, culverts, etc.

2.6 Recent Progress of the CRIMP

CARE commenced its Central Region Infrastructure Maintenance Programme in December 1999 with a project duration of two years.

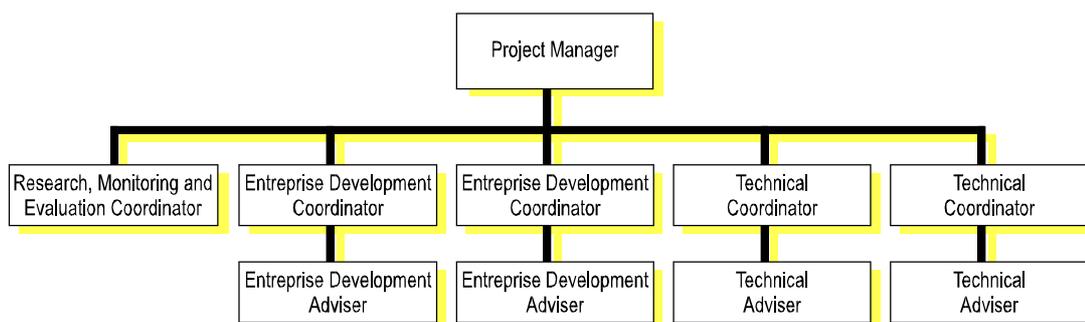
2 National Construction Industry Act, July 1996

A pre-implementation workshop was arranged in February 2000, during which the project was introduced to the key partners in the road sector. This workshop included participants from NRA, MoTPW Training Centre, NCIC, MASAF, the District Assemblies and the district road supervisors.

The project has selected two traditional authorities in Lilongwe District and one traditional authority in Dedza Districts in which the project activities will be carried out. The villagers in these areas have been informed about the intentions and activities of the project and have already identified their priorities for road access.

In March this year, the project commenced its work with identifying suitable candidates for participation in the small-scale contractor development programme. At the time of finalising this report, the project was carrying out the final selection of small-scale contractor candidates for the rehabilitation works.

CARE has employed a multi-disciplinary team of national professionals which will provide technical and managerial support for the implementation of the project. The CARE project organisation is described in the figure below.



Chapter 3

Objectives and Strategy

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3.1 Objectives

The development objective of the CRIMP is "increased long term economic growth and improved household livelihood security in two districts in the Central Region of Malawi".

The purpose of the CRIMP as stated in the project memorandum is:

To develop systems for sustainable and cost effective rural feeder road maintenance that directly contribute to improved household livelihood security in selected Traditional Authorities in two districts of the Central Region of Malawi.

The programme will achieve the following three outputs as a means to contributing towards the programme purpose:

- (i) Effective community based contract associations (CA) established, maintaining 800 km of rural feeder roads.
- (ii) Improved skills and confidence amongst CA members to manage resources and generate income that improve their livelihoods.
- (iii) Effective small-scale community contractors (SSCC) established for the rehabilitation of 150 km of rural roads.

3.2 Target Beneficiaries

The project target area has been identified as Lilongwe and Dedza Districts.

The direct beneficiaries are identified as:

- (i) technical and supporting staff in the public sector: project managers, engineers, supervisors and accounts clerks,
- (ii) policy makers, planners and administrators at district and central government levels,
- (iii) emerging small-scale contractors, who will receive a start in business and the skills needed to develop successful contracting firms.

The above will participate in training courses, workshops, seminars and on-the-job training for which the project will provide inputs in the form of providing a comprehensive purpose oriented training package.

Finally, the unemployed and under-employed rural workers and their families in the areas where the road works will be carried out will benefit through the employment opportunities and cash income that will be generated as the project is implemented. The completed project will, in turn, contribute to the process of rural development by contributing to agricultural productivity, through improving access to markets as well as to health, education and other social services, currently inhibited by the lack of a well maintained transport system.

3.3 Labour-based Technology

The project intends to achieve the physical outputs through the engagement of emerging small-scale contractors and petty contractors trained in the use of labour-based road works technology.

Labour-based technology contrasts markedly with the conventional practices of using capital and equipment-intensive construction technology. The latter is often mistakenly assumed by some development decision makers to be the most appropriate and the most cost and quality effective, largely because they are the technologies used in industrialised countries.

Definition

Labour-based technology is defined as the construction technology which, while maintaining cost competitiveness and acceptable engineering quality standards, maximises opportunities for the employment of labour (skilled and unskilled) together with the support of light equipment and with the utilisation of locally available materials and resources.

In actual fact, numerous studies carried out by the World Bank and others, in many countries including Malawi, demonstrate that when the right conditions are present in a given area, labour-based technology is the most cost-effective approach to rural infrastructure development. These conditions include (a) sufficient numbers of under- or unemployed persons in the areas where the work is required plus local

availability of construction materials; (b) a low-wage structure (under US\$4.00 per day according to World Bank studies); (c) shortage of conventional construction equipment and high capital costs; (d) small contractors skilled in labour-based technology and capable of supervising the work efficiently; and (e) competence of the public sector agencies responsible for rural infrastructure works in the areas of contracting and supervision of contractors' performance. Except for the last two, these conditions prevail in most rural areas of Malawi, (where incidentally, the opportunity cost of unskilled labour has been found to be about US\$ 0.63 for an 8-hour work day.

In Malawi, the experience gained by programmes such as the DRIMP, the VARBAU and most recently the MASAF, clearly shows that the labour-based approach to rural road construction and maintenance is a feasible and cost effective strategy and acceptable to the rural population.

3.4 Use of Local Contractors

When involving the domestic private sector in the execution of labour-based road works, there are several important issues which need proper attention during programme design and implementation. Local contractors will not provide an easy solution to road rehabilitation and maintenance problems. The development of small-scale contractors entails a series of new activities such as training in business management, development of user-targeted training material, development of appropriate contract procedures, streamlining of payment procedures and last but not least providing interested contracting firms with attractive market prospects and a conducive environment in which they can operate efficiently.

The size of the contracting firms is important when identifying and selecting appropriate contractors for a specific type of work. The optimal solution is to target contractors who would use labour-based methods as a main source of livelihood. Larger contractors are normally not interested in labour-based works contracts since the value of these contracts are considered to be too small.

Before a training programme is formulated, it is important to identify the various types of contracting firms which operate in the country. The table below provides a general description of the different types of contractors, categorised according to their size and the type of works they are able to carry out after participating in a training programme.

Types of Contractors		
Type	Description	Type of Works
Petty Contractors	<ul style="list-style-type: none"> ○ single person ○ labour only ○ limited skills ○ not registered 	<ul style="list-style-type: none"> ○ routine road maintenance, ○ labour only sub-contracts, ○ spot improvement works, ○ earth road rehabilitation
Medium sized Contractors	<ul style="list-style-type: none"> ○ registered ○ possess basic equipment ○ capital security low ○ entrepreneurial skills ○ technical and managerial skills 	<ul style="list-style-type: none"> ○ road gravelling works, ○ major rehabilitation works, ○ small bridge and culvert works, ○ construction of gravel roads
Large-scale contractors - normally not interested		

The CRIMP is planning to carry out (i) routine maintenance works and (ii) earth road rehabilitation works. From the description of various types of contractors provided in the above table, it would be logical to recruit the contractors from the first group.

If the project decides to carry out any bridge works or gravelling works, activities which would require more technical skills and equipment, it would be logical to search for firms with the required resources from the second group.

3.5 Petty Contractors

This category of contractors usually consists of one man firms, sometimes assisted by a limited amount of tools and unskilled workers. They may be labour contractors, usually consisting of a local businessman sub-contracted to carry out specific work, relying mainly on unskilled casual labour.

Organised local community groups such as farmers associations and village welfare groups can also be classified as petty contractors.

A common feature for this group is that they are not formally registered. They do not possess any capital and are therefore extremely vulnerable to cash-flow distortions such as late payments. Most of these contractors do not operate their accounts through a bank. In most cases the local banks do not consider them as attractive clients and therefore do not provide them any services.

The petty contractors normally do not possess any equipment, and lack any means of transport. Due to their lack of mobility, they are recruited from the vicinity of the work sites. These contractors are mainly used for maintenance works or simple, clearly defined sub-contracts requiring a minimum of skilled labour and equipment.

After receiving appropriate training development assistance, these contractors can prove to be highly efficient in carrying out both road rehabilitation and maintenance works. Some show good entrepreneurial drive, and given favourable conditions for their operation, such as a steady supply of work and regular and timely payment, they can survive as sound small-scale construction firms and constitute an important component of the domestic construction industry.

When developing small-scale contractors to implement labour-based road works, it is important to ensure that the authorities are able to supply a steady amount of works to the newly established "firms". In order to defend investments in terms of project development and training costs, a firm government commitment on future work prospects is required.

When the contractors are well established, they should be encouraged to look for assignments funded by other sources, thereby reducing the dependency on a specific project. It is envisaged that the small-scale contractors will eventually be able to bid successfully on works funded by other programmes such as MASAF and regular funds channelled through the NRA.

3.6 Contract Management

Although it is now intended to utilise the private sector to carry out the road works, there is still a demand for considerable support to the government authorities in charge of the road network. Despite this privatisation, it is incorrect to assume that construction work, carried out by private firms, exonerates the client from any responsibility for the supervision and inspection of work. In order to ensure that the works are efficiently executed, the local authorities must assume quality contract management.

The Ministry of Works and its district organisations, due to its history of force account works, have been developed as road works implementors. This includes operating equipment, employing mechanics and other cadres of staff experienced in direct execution of road construction works. With the shift to the use of the local construction industry, their future role and responsibilities will change dramatically. This implies that totally new performance requirements will need to be defined for the staff in their new role as contracts managers, which in the next turn will require a radically different organisation.

In order to ensure that the government efficiently takes on its new role as contract managers, there are a number of activities which needs to take place:

- Contracts management may be a new field of responsibilities for the field staff. Efficient management procedures needs to established within the organisation which allow for private contractors to operate.
- Since most labour-based road works have previously been carried out through

force account procedures, appropriate contract documentation needs to be prepared for this specific type of work and technology.

- As compared to force account operations, works needs to be properly documented in advance when using contractors. Existing planning procedures need to be carefully reviewed and further strengthened.
- Finally, when the above measures have been carried out, it is important that all member of the contracts management organisation is properly trained in carrying out their new roles and responsibilities.

Past experience from small-scale contractor development programmes have clearly shown that these activities are equally important and resource consuming as the training and development of the contractors.

3.7 Contract Documents

The procedures currently in use in most road authorities in developing countries do not lend themselves to the efficient management of small contracts for works such as rural road rehabilitation and maintenance. Those procedures were not originally intended to apply to small works, which in the past were usually performed by direct labour and not under contract. The procedures governing the procurement of works and management of works contracts were generally based on the industrial countries' regulations governing the management of large contracts for new construction work. The use of such inappropriate procedures in the case of minor works executed by small contractors can have dire consequences in terms of contract management, administrative costs, completion time, and cost of the works, while also having a serious impact on the health of the contractors concerned.

The reform of the procurement and contract management procedures for small works, or rather the process of adapting them to meet real needs, includes the following elements:

- tightening up the financial/technical programming of the operations to be carried out;
- simplifying and standardising procurement and management procedures;
- delegating authority to appropriate levels;
- putting in place a proper progress monitoring system; and
- codifying all of the above in manuals of procedures.

Performance indicators should measure the efficiency of the organisation responsible for contract management and, if regularly monitored and published, would have a very significant psychological impact in terms of spurring those concerned into action.

3.8 Competitive Bidding

The purpose of competitive bidding is to obtain the best possible results at the lowest price for the execution of the work specified by the client. It implies the use of procedures designed to protect the client effectively against collusive bidding by preventing any kind of preferential treatment or fraud. Furthermore, it is necessary in order to provide equal opportunity to all contractors who wish to take part in the works, by applying an objective evaluation method during the comparison of the tenders.

However, for works demanding a particular kind of technology, such as rehabilitation of rural roads using labour-based methods, contractors possessing such experience are not available.

For this reason, training programmes for contractors are necessary, and negotiated contracts - which reflect the real costs of the works - are initially awarded to those enterprises which have successfully completed their training. These negotiated contracts, established between the client and the contractor are not open to any real competition. However, this is a procedure which is only recommended during an initial phase of a contractor development programme where the core objective is to create a cadre of competent local entrepreneurs.

Even for these contracts, a bill of quantities and a list of unit rates are included to enable the contractors to evaluate the costs of the different activities in the course of their work. Furthermore, the trained contractors should be requested to submit bids for the work also in the initial phase, more as a training exercise thereby preparing them for a later stage when works will be awarded in a more competitive environment. The ultimate objective is to put the contractors in a position where they can execute contracts awarded on the basis of an open tendering.

Chapter 4

Implementation Model

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4.1 General

There are two major physical outputs of this programme. One is to establish a functional road maintenance system, based on petty contractors recruited from the villages in the vicinity of the feeder roads. The second is to develop small-scale contractors in order to carry out road rehabilitation works.

The project aims to pilot the following two models:

1 Employment of women in road maintenance through Contract Associations: Women will be organised into groups, termed Contract Associations, which will be contracted out by their respective Traditional Authorities to maintain rural feeder roads. During the course of their employment the women will receive appropriate training aimed at building their confidence and providing them with skills in basic business management, financial management, savings and credit management. Part of their payment will be retained in savings accounts. After graduation from road employment, their savings will be accessible, enabling them to utilise the money for expansion or development of economic activities.

2 The establishment of indigenous small scale community contractors: Small scale contractors will be identified and given training in contract management, tendering, pricing and technical aspects of road rehabilitation works. By creating a network of contractors at community level, the programme can contribute towards the development of sustainable, cost-effective and efficient systems for rural road maintenance. CARE will work with the NRA and District Assemblies to identify and mobilise potential contractors. Training for the contractors will be conducted in conjunction with the NCIC and MoTPW training staff. After the training, the contractors will be awarded contracts by the project on a competitive basis.

Engaging petty contractors has proven to be a very effective way of addressing the demands for routine maintenance works on feeder roads. It is fairly easy to establish in terms of training and management development, and requires less supervision than the classic lengthman approach.

However, before such a system is put in place, it is important that the road network is in a maintainable condition, thereby limiting the work of the petty contractors to routine maintenance activities and not also expecting that these small organisations should cater for rehabilitation works.

For this reason, it is important that other potential players, such as emerging small-scale community contractors, can provide the more complex works such as road rehabilitation, spot improvements and periodic maintenance, which require more skilled personnel, tools, materials and sophisticated management.

4.2 The Key Players

The general conditions of a civil works contract normally defines the roles and responsibilities of three basic parties. Contract agreements are entered into between a Client, i.e. the owner of the assets to be created and a contracting firm, the executor of the works. In addition, the works are normally supervised and verified by a third party, the Engineer. Also, for road works using labour-based work methods, it is important to clearly identify these three parties.

Once the local institutions, which will take on these roles, have been clearly identified, it is possible to carry out a detailed assessment of their current capacity and prepare recommendations on training demands and further technical, managerial and financial support, thereby ensuring that each party to the contracts will fulfil its operational responsibilities.

(i) The Client

Implementation of main, secondary and tertiary road works is entrusted to the National Roads Authority. Currently, the responsibility of the remaining road network of Malawi lies with the District Assemblies. Any improvement or maintenance works carried out on these roads, should in principle therefore be based on initiatives from the District Assemblies.

It is strongly recommended that CARE identifies local institutions which can assume the role of the client and the engineer. When introducing local small-scale contractors for public works programmes, it is equally important to develop a capacity within local authorities to manage the works executed by the contractors. This will enable the local authorities to continue to contract out works to such contractors using other funding sources after the CRIMP has come to an end, and thereby securing the contractor's prospects of future works.

A basic assumption when dealing with any contract agreement is that the Client is also the provider of the financing of the contracted works. Funds may originate from various sources such as the Government Treasury, the Road Fund, donors and local tax revenues. However, when the Client enters into a

contractual agreement, certain financial obligations are made, and in order to honour those obligations, it is essential that these funds are readily available to the Client. If these funds are not available, then the Client is legally not in a position to award the contract.

For this reason, if a donor such as CARE wishes to appoint a District Assembly as the Client (or Employer) of the works, it is important that funds are transferred in advance to the district, thereby ensuring that the designated Client can honour its obligations.

(ii) The Engineer

In terms of implementing works, the Client often chooses to delegate these responsibilities to a third party, the Engineer (also referred to as the Contracts Manager). Particularly in situations where the work is dispersed over a large geographical area, it would seem natural for the Client to choose an institution which is well represented at local level.

The decentralisation of responsibilities and authority, which is essential for local decision-making, is a key factor in the success of geographically dispersed programmes of this nature. It is particularly important in small-scale works, for which the resources of central government departments have seldom been sufficient even when the economic context was more favourable. Genuine decentralisation enables local organisations to "exert pressure" and therefore to defend their projects better because, at that level, the negotiating partners and the needs of the population are better known. This enables beneficiaries to have a greater influence on the technical choices, methods of implementation, operation and maintenance aspects of the project and, in addition, to know who the community must turn to in case of difficulties.

The responsibility for the rehabilitation and maintenance of rural roads have been vested in the district assemblies. However, the district assemblies still do not possess any technical staff which can be assigned the duties of the Engineer. Instead, it would therefore be natural to assign this role to the MoWS District Offices. Since they are already represented at local level, with a certain amount of technical

experience in this field, it would be logical to use their resources to cover the responsibilities of the Engineer.

The duties of the Engineer, in the context of a works contract, are summarised in the table below:

The Engineer appointed by the Client to supervise the works, will be in charge of administrative, technical and financial control of the works, daily on-site supervision, issue of payment certificates and the final completion certificate. The Engineer shall be responsible for the following activities:

Administrative duties:

<ul style="list-style-type: none"> • maintaining daily site records and preparing progress reports on the status of the project, • ensuring liaison with the local authorities and institutions, particularly on matters such as land disputes, authorisations to carry out surveys, access to quarries, etc., • suggesting suspension of the works to the Client in case of serious flaws, 	<ul style="list-style-type: none"> • issuing of the completion certificate and the maintenance certificate for the handing over of the works, • playing the role of a mediator in the settlement of disputes between the Contractor and the Client, • Ensure that workers are paid according to the schedule and rates agreed, • Arrange site meetings
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Technical duties:	
<ul style="list-style-type: none"> ensuring that the Contractor has complied with work standards, conditions of contract and the schedule of works specified in the contract, informing the Client promptly of any defects for which the Contractor is responsible and which could be detrimental to the quality of the project, providing technical and managerial advice to the Contractor, as needed, 	<ul style="list-style-type: none"> ensuring that the Contractor respects the planned time schedule for the works, advising the Client on possible modifications in the plans, specifications and work methods, ensuring proper execution of remedial works before final handing over of works.

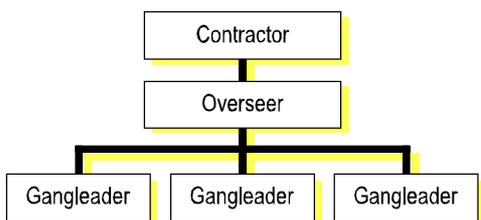
Financial duties:	
<ul style="list-style-type: none"> liaise with the clients representative to ensure regular budgetary provision for the work under contract, carry out surveys with the Contractor to calculate the quantities of works actually completed, 	<ul style="list-style-type: none"> certifying monthly statements and submitting interim certificates to the Client for payment, liaise with the client representative to ensure the timely payment of certificates.

(iii) The Contractor

The type of road works envisaged to be carried out can be grouped into two main categories according to the size of works, requiring contractors with two different profiles:

- small-scale contractors carrying out rehabilitation and periodic maintenance of rural roads, and
- petty contractors providing routine road maintenance.

It is proposed that the envisaged road rehabilitation contractors are equipped adequately to execute a monthly production of 1 - 2 km of completed earth roads. This would require an average labour-force of approximately 50 - 100 unskilled casual workers. In order to manage an operation of this magnitude, it is estimated that the firms will need the management staff as described in the figure below.



Each contractor should ideally possess the services of an overseer in his management team for the technical supervision and management of the works. In addition, it is envisaged that the contractor himself will also be operating as a supervisor on site. For the direct supervision of labour, the contractor will need to recruit an appropriate number of gangleaders.

If the firms wish to appoint staff with higher qualifications, this should be regarded as an advantage during the selection of the initial batch of contractors. It should be noted that the candidates selected to participate in the programme need to recruit this staff before commencement of the training programme since this staff will be part of the core target of the training.

For the contractor associations carrying out routine maintenance, the structure of the firms will be far simpler, basically consisting of one person acting as a representative for the other association members. The CA representative would be expected to take part in the physical

works in line with the other workers, in addition to carrying out the supervisory duties and dealing with contractual issues (i.e. receiving instructions from the maintenance inspector, measurement and payment, responsible for tools, etc.).

4.3 Planning, Design and Contracts Preparation

Through the decentralisation act, the government has decided that the responsibility for the planning, design and implementation of road works not carried out by central authorities is vested with the District Assemblies. Although the physical work is expected to be carried out by the private construction industry, there will still be a number of technical services which needs to be carried out by a road works unit at district level:

- identifying and prioritising roads for rehabilitation and maintenance (in consultation with local authorities),
- regular inspection (condition survey), maintenance planning, and immediate response to any emergency and unforeseen work requirement,
- design of road rehabilitation works and repairs to drainage structures, i.e. small bridges, culverts, drifts, erosion protection, etc.
- preparation of contract documents, bill of quantities and cost estimation, inviting bids, contracts evaluation and award of contracts,
- contract supervision and management.

To date, the District Assemblies have not been furnished with the manpower and other resources to carry out these functions. For the purpose of the CRIMP, it is again recommended that the district road supervisors are utilised until the district authorities receive the resources necessary to carry out this work.

In this respect it should be acknowledged that the MoWS resources which still exist in the districts are rather limited. In Lilongwe and Dedza Districts this amounts to a total of three supervisors. Although MoWS today do not carry out any road works, this staff is already utilised by other programmes such as MASAF and the WFP Food for Work Programme.

With the physical work programme envisaged in the CRIMP over the next two years, it is clear that the district road supervisors will not be able to adequately cover the planning, design and contracts preparation activities in addition to contracts supervision of the CRIMP road works programme. The only immediate solution to this seems to be that the CRIMP technical staff plays a gap-filling role to meet the personnel requirements of these activities.

However, the district road supervisors should still be regarded as an important resource due to their detailed knowledge of the rural infrastructure in their respective districts as well as the long working experience they have accumulated in the field of rural road works. They should therefore be utilised to the extent possible and be provided with the logistical support enabling them to perform their duties in an efficient way.

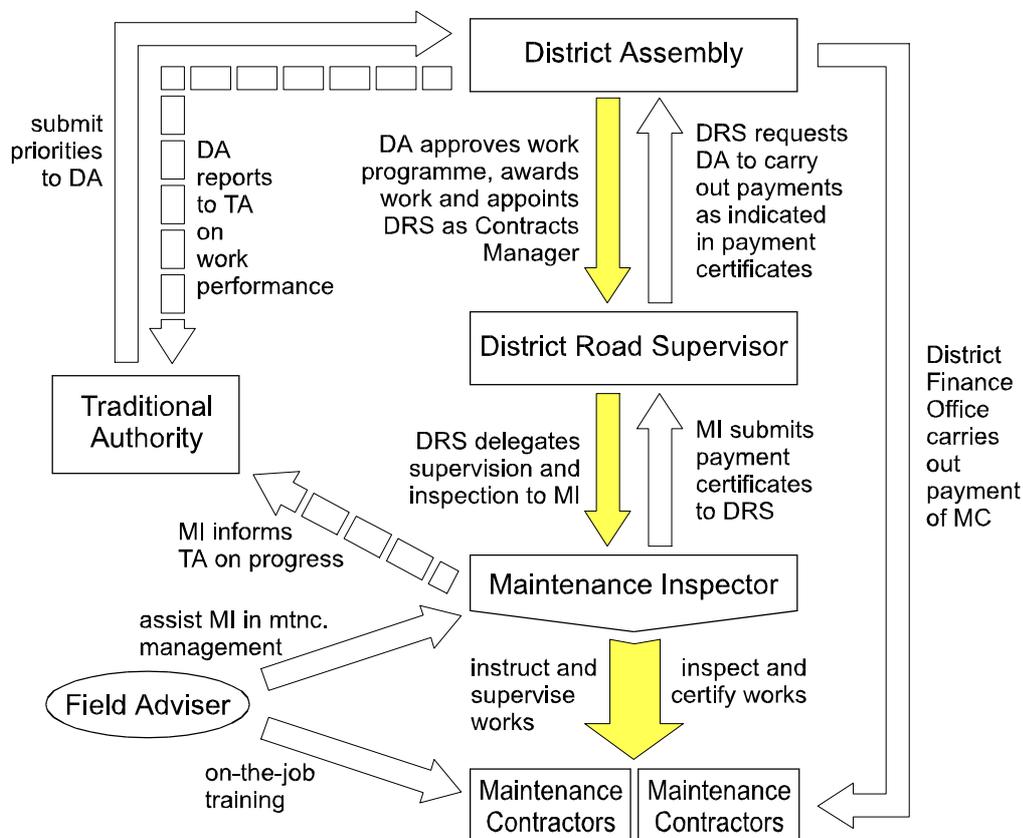
4.4 Routine Road Maintenance

Routine maintenance of low traffic rural roads is a widely dispersed activity, requiring small resource inputs over a large number of widely separated points. For this reason, this activity is well suited for manual labour. The amount of work needed to keep a length of road in good condition depends on several factors, such as type of road surface, traffic volume (number, type and size of vehicles), the severity of climatic conditions, especially rain fall, type of soil; the susceptibility of the terrain and road gradients to erosion, and the presence of bush and vegetation. Under average conditions, experience show that an input of 10 work days per month should cover the routine maintenance works of a 1 km road section, with traffic of about 25 to 100 vehicles per day.

Traditionally, routine road maintenance has been organised according to the lengthman system, which is based on assigning one person to take care of a section of approximately 1 km. This is the most common approach to maintenance when using labour-based work methods. The lengthman system has proven effective also in Malawi, however, one of its drawbacks is that it requires intensive supervision.

One way of solving the issue of effective supervision is to introduce petty contractors, basically consisting of a group of lengthmen which are assigned to a longer road section (5 to 15 km). Instead of entering into a contract with each lengthman, a maintenance contract covering a longer road section is awarded to a local petty contractor employing 5 to 15 persons depending on the amount of work.

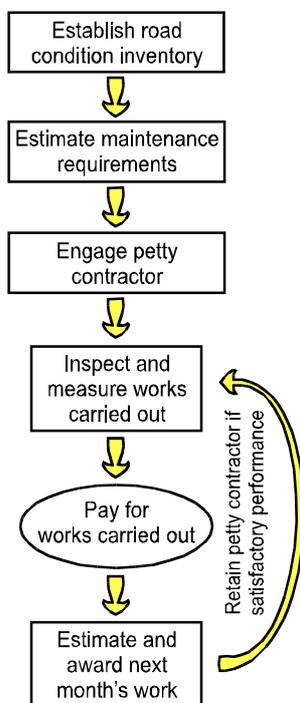
The contracts should be prepared, awarded, managed and paid for by the district authorities, once work plans and funding have been approved as proposed in the figure below:



The length of the road section covered by one contract would depend on the distance between the villages. Larger contracts will entail reduced supervision and management requirements due to less number of contracts to administer. On the other hand, the issue of community involvement is better secured if the petty contractor is recruited from the adjacent village. In any case, the use of petty contractors reduces administrative procedures, as well as delegating direct supervision of individual workers to the contractor. The responsibility of the maintenance inspectors is then limited to supervising and instructing the representative of the petty contractor.

This system allows for a payment system based on performance rather than attendance, since contracts are based on specific work tasks and unit rates, rather than the attendance of the workers.

Equipment, consisting of simple hand-tools, needs to be provided to the contractors, thereby eliminating any prior requirement for investment capital. The contractors are responsible for the proper caretaking and maintenance of the tools, and are expected to return the tools upon completion of their works contracts.



The management procedures for routine maintenance contracts are summarised in the figure below. Basically, it starts with the maintenance inspector carrying out a road condition survey. Based on this survey, a workplan for road maintenance is prepared. This workplan (i) forms the basis for the cost estimates and detailed budget planning and (ii) is eventually used as the detailed instruction to the petty contractors.

Based on the volume and distribution of work, an appropriate number of petty contractors are recruited to carry out the work. A time schedule for the execution of the works is agreed and at scheduled intervals, the works completed are inspected and paid for. For the purpose of monitoring works as well as overseeing the condition of the road, it is practical to issue contracts which require on average one month to complete.

If the petty contractor have carried out the works to according to the agreed time schedule and to agreed quality standards, the contractor is awarded new works when and as required.

Due to the limited value of the routine maintenance contracts, it is recommended that the use of any competitive bidding process is waived and that contracts are issued on a fixed unit rate basis.

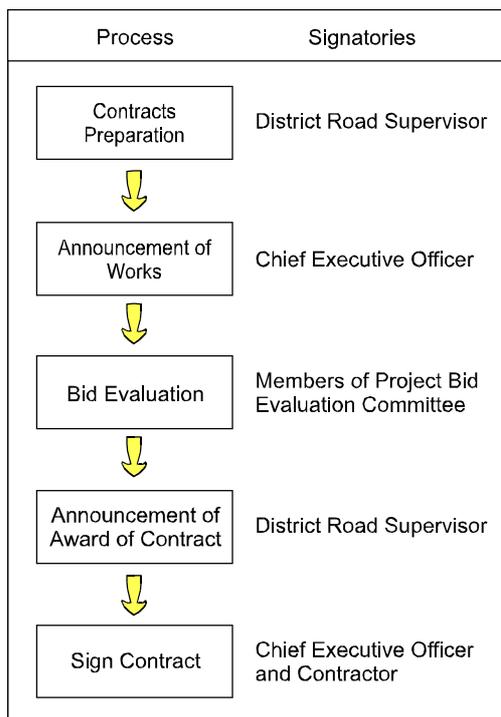
The Road Maintenance Management Manual prepared by the consultant defines the various maintenance works activities, how they are measured and paid for. It also describes the exact use of the various documents as mentioned above, how they are prepared, by whom, filing and approval procedures, etc.

4.5 Rehabilitation Works

As compared to the routine maintenance works, the contracts management system for the rehabilitation works needs to follow a more comprehensive system, using commonly accepted procedures and principles for contracting. For this type of works, it is recommended that the

contractors enter into contract agreements with the district authorities for work with a duration of three to twelve months. These agreements need to contain the normal documents such as conditions of contract, work specifications and priced bill of quantities. Due to the longer duration of these contracts, there will be a demand for interim payments before all the contracted works have been completed.

The rehabilitation contracts should eventually be awarded on the basis of bids submitted from pre-qualified contracting firms. Considering the value of the works, the most appropriate would be to invite a minimum of three bidders to quote on each contract. Conditions for pre-qualification could be the address of the contracting firm, current availability and most important the possession of staff which has received adequate training in labour-based road works technology.



Ideally, the contract preparation, and prior to this stage, the planning and prioritisation of the road works should be carried out by the district authorities. Since there is still no technical staff available within the District Assemblies to provide such functions and services, it is recommended that these responsibilities are left with the District Road Supervisors. Since, even this is solution will not provide sufficient technical manpower resources, it is recommended that the CARE technical staff provides support in the form of gap-filling personnel to secure these services.

The process of announcement of bids, bid opening, bid evaluation, award of contract, inspection and supervision of works, certification and payment of works and finally issue of final completion certificates for rural road works contracts should also be carried out by the District Assemblies. Since they still have not been given the resources to perform such duties, it is recommended that the District Road Supervisors and the CARE technical staff assigned to the CRIMP is utilised for the required engineering inputs.

4.6 Payment Procedures

As opposed to other labour-based public works schemes in Malawi, this project should aim at a system of payment of works strictly based on performance. A basic concept when dealing with civil works contracts is that payments of services are based on measured completed quantities which are paid for according to prior agreed unit rates.

Calculation of Unit Rates

For labour-based works, the wage component of unit rates for most work activities constitute a major component of the cost. For this reason it is important that the unit rates established when estimating and budgeting costs are at levels which allow for wage rates which:

- (i) are sufficiently attractive to provide the required labour recruitment, and
- (ii) provide sufficient motivation for the achievement established task rates.

When estimating and tendering for works, it is important to differentiate between average production rates and task rates. A production rate is the average specific labour input measured over a longer period of time, preferably over several work projects, including losses of production due to faulty works, disruptions due to bad weather, etc. Such rates will represent an average of the efficiency of sites which have been well organised as well as sites where the work organisation was short of expectations. In some cases, the average production rates for the purpose of estimating would be 30 to 40 percent lower than the actual task rates given to the individual workers.

Since these activities are mainly carried out by labour, it is also important to bear in mind the variations of the soil conditions depending on when the works will be carried out. In the rainy season, task rates can be increased to the double as compared to excavating hard soils in the dry season.

The unit rates would in addition include a provision for depreciation and maintenance costs of hand tools, supervision and profits.

The costs of tools should be based on the prevailing cost of hand tools in the country. It is recommended that they are depreciated over a period of one year of continuous usage, including the replacement of good quality handles once during this period.

Due to the limited number of supervisory staff and their limited professional qualifications, the real costs of supervision is fairly limited. A flat rate not exceeding 10 to 15 percent of the costs of all physical works activities would sufficiently cover such expenses.

Profits should be charged to all the above mentioned cost items. A rate of 15 percent is often deemed acceptable in these type of programmes.

Payment of Works

For the routine maintenance works, payment should be carried out on a monthly basis. Once measurement of works have been carried out by the maintenance inspector together with the maintenance contractor, a date and venue for the payments needs to be agreed. Payments in cash should be carried out by a pay clerk from the district authorities according to the payment advice provided by the maintenance inspector.

A similar system needs to be established for the rehabilitation contractors. Upon submission of an invoice, the Contracts Administrator prepares a payment certificate on which basis the district authorities issue payments. Payments to the rehabilitation contractors should not be in cash. Instead, the small-scale contractors should be paid by cheque which can be cashed in a local bank in their respective districts.

Funds Transfer to the Districts

Funds transferred from CARE to the district authorities should be done on an advance basis on the submission of a detailed workplan, budget and expenditure forecast from the districts. The advanced funds should be replenished on the basis of details of actual expenditure and new expenditure forecasts. It is good financial practice to replenish funds when there is still sufficient funds available at local level to carry the planned expenditure of one month.

The authorities have already established a District Development Fund which is utilised for the implementation of works financed by both regular government sources and the donors (i.e. UNCDF, UNDP and Concern). Also, there are procedures established by some donors,

relying on special project accounts dedicated uniquely for a single project. Since adequate cash-flow is vital to the timely payment of works, it is strongly recommended that the project establish separate project accounts for the CRIMP project. In order to further ease accounting, each rehabilitation works project should have a separate bank account. For the routine maintenance works, an account could be established to cover works in each of the traditional authorities.

MASAF has established a similar system for its public works programme. It is recommended that the CRIMP to the extent possible utilise these procedures to secure their cash flow to the districts.

The detailed procedures adopted in terms of cash flow from central level to the district authorities and further on to the payments to the contractors, need to be closely monitored for its efficiency. The timely payment of the contractors will be crucial to their success and ability to operate using labour-based methods. A vital performance criteria of the payment procedures is that the contractors are payed within a maximum of one to two weeks after they have submitted an invoice. Further delay will compromise the contractor's ability to pay the workers, which in the next turn will have a detrimental effect on the job motivation of the labour force and finally lead to reduced production rates.

4.7 Equipment

For both the routine maintenance and the rehabilitation works, it is expected that there will be a very limited demand for construction equipment and purchase of materials, instead mainly relying on the use of labour equipped with appropriate hand tools.

For both routine maintenance and rehabilitation works, the tools should be used solely for the purpose of the project and shall not be used for any other works. In terms of the small-scale contractors, the tools should not be used for any other purposes until the contractor has paid back the full costs of the tools.

(i) Routine Maintenance

The petty contractors engaged in routine road maintenance should be issued the hand tools on loan at the same time as they awarded a contract. When they complete their works contracts, these tools should be returned to the district authorities.

(ii) Rehabilitation Works

The small-scale community contractors should acquire the hand tools under a hire purchase agreement. Appropriate clauses in the contract documents should provide for deductions for repayment of the costs of such tools.

(iii) Training

During the training period for the small-scale community contractors, there will be a demand for a set of tools for the practical field training sessions. This includes a full set of setting out equipment as well as hand tools for the earth works.

After the training has been completed, these hand tools can be distributed to one of the small-scale contractors or the maintenance contractors.

(iv) Logistics

Planning and supervision of road rehabilitation and maintenance works involves extensive travelling for the purpose of conducting surveys and inspecting works. With the management setup proposed in this chapter, it is important that the staff, including both the CRIMP technical personnel and the district road supervisors have full access to appropriate means of transport. The performance of the contracts management staff will be a key indicator of the success of this project. It would be sad to see that their efforts would be hampered by lack of transport.

In addition, it is of vital importance that the district finance personnel in charge of payments to the maintenance contractors are secured necessary transport. Payment of the contractors should be carried out at their respective sites or in the villages from which they were recruited.

4.8 Reporting and Monitoring

As for road works carried out by force account, physical works progress should be documented and monitored in comparison with daily, weekly and monthly workplans. Equally, all transactions of tools and materials need to be fully accounted for.

With minor modifications, the reporting and monitoring system used under the DRIMP can be applied to the road rehabilitation works. It will be expected that the small-scale contractors will apply this system as part of their work programming.

For the routine maintenance works, a complete planning and monitoring system has been included in the Rural Road Maintenance Management Manual.

Chapter 5

Contract Documents

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5.1 General

Contracts form a legal agreement between two parties for the procurement of goods or services. In the field of civil works, the contract will relate to the construction of some facility, and the size, complexity and cost of such facilities may vary widely. All contracts need to be legally valid and need to cover certain fundamental requirements to enable them to effectively serve their purpose. With care, they can be written to cover the basis essentials in appropriate detail to the size and complexity of the works to be undertaken.

Even if documents of greater or less detail are to be used for the varying scale of project, one essential element is to attain continuity throughout the different documents. This will enable any contractor development programme to operate in an orderly sequence as contractors move through the various categories of contracts based on increasing complexity and volume. Thus a contractor or contracts manager understanding the concepts of a contract document in its simplest form, will find a familiarity with the more detailed documents used for larger projects.

Similar to the implementation model described in the previous chapter, the proposed contracts management procedures consist of two distinct packages, one covering the routine maintenance works and the other covering the road rehabilitation works. The contract documents for each of the components and the justification of their final design are described briefly in this chapter. The documents and the detailed instructions on how they are applied are found in the following documents prepared by the consultant:

- Contracts Management Manual, Labour-based Road Rehabilitation, and
- Rural Road Maintenance Management

5.2 Basic Requirements

There are some basic requirements for all contract conditions for civil works, and these may be summarised as follows:

- definitions and responsibilities of those involved in the contract,
- general obligations of the parties to the contract,
- undertaking of works (start, completion, work standards and methods, defects),
- payment procedures (by whom, when, what basis, retentions),
- liabilities and insurances (responsibilities of each party),
- settlements of disputes.

In order to create an environment in which the contractors may succeed on a long-term basis, there needs to be as much emphasis on good, clear and fair conditions of contract as on the technical standards of the construction works itself. To this end both the contractors themselves, the Client, the Engineer and their staff need to be made aware of the rights and obligations contained in the contract and, most importantly, how they are to be operated in practical ways during the performance of the contract.

5.3 Road Rehabilitation Works

The road rehabilitation works envisaged under the CRIMP, although limited in scope and value, represent the most complex works to be undertaken. Most of the work is expected to be carried out using mainly locally available resources such as unskilled workers, local materials and a limited amount of tools and equipment. Despite the simplicity of the works, it is recommended that standard documents and procedures for contracting are applied, however, adjusted to the limited size and extent of the works envisaged. Following the above formula, the consultant has prepared the following documents, adjusted to the demands and conditions under which the CRIMP will be operating:

- | | |
|---------------------------------------|--|
| ○ Notice for Invitation, | ○ Bill of Quantities, |
| ○ Instructions to Tenderers, | ○ Evaluation of Tenders, |
| ○ Form of Tender, | ○ Notification of Award, |
| ○ Form of Agreement, | ○ Payment Breakdown, |
| ○ General Conditions of Contract, | ○ Interim Payment Certificate, |
| ○ Appendix to Conditions of Contract, | ○ Certificate of Practical Completion, |
| ○ Special Conditions of Contract, | ○ Final Certificate of Completion, |
| ○ List of Basic Labour Rates, | ○ Time Location Chart, |
| ○ Works Specifications, | ○ Contracts Register. |

These documents and detailed instructions on their use have been compiled in the Contracts Management Manual for Labour-based Road Rehabilitation.

The main consideration in this section is given to the conditions of contract. Other documents such as the Form of Agreement, Form of Tender, Works Specifications, Bill of Quantities and drawings are generally not a cause for contention or dispute. They can also vary according to the individual contract without affecting the basic rights and obligations of the contracted parties.

The principal common to most civil works contracts is to include the following documents to cover each particular contract:

- General Conditions of Contract,
- Appendix to Conditions of Contract (or Contract Data), and
- Special Conditions of Contract.

The consultant has reviewed a number of standard contract documents used in Malawi as well as in other countries where small-scale contractor development programmes are taking place. In Malawi, it is clear that not only do practical documents already exist, but also a number of continuing initiatives on document development are being undertaken.

(i) General Conditions of Contract

Currently, the most common conditions of contract used in the road sector of Malawi is the 1994 edition of the Minor Works Contract, developed by Ministry of Works. This seems to be the standard also applied for contracting civil works by the NRA and MASAF.

This contract covers the essential requirements as mentioned above. Some of the clauses may not be required for the type of works envisaged in the CRIMP, so the consultant has prepared a reduced version of this document which can be used for the small-scale road rehabilitation contractors. The changes made are discussed in detail in Section 5.4.

(ii) Appendix to Conditions of Contract

The main point of using an appendix to the General Conditions of Contract is to leave the contents of the General Conditions unchanged for all works contracts and instead include all the conditions which may vary in an appendix. This simplifies the contracts preparation as well as provides a clear distinction between fixed terms and the conditions which vary from one contract to another.

The appendix should contain specific information which is only referred to generally in the General Conditions. This includes:

- name of the Client,
- name of the Contracts Administrator,
- name of Contractor,
- location of works,
- dates of commencement and completion,
- retention monies,
- duration of defects liability period,
- minimum amount of interim certificate,
- time for payment to be made after issue of certificate,
- payment schedule,
- insurance requirements.

(iii) Special Conditions of Contract

The fact that labour-based technology is to be used does impose certain contractual constraints which need to be clarified. The proper place for this is in the Special Conditions of Contract. The issues which need to be covered are:

- the application of labour-based techniques for the implementation of works,
- the importance of a detailed work programme showing the mix and balance of labour and equipment, for the approval of the Contracts Administrator before the commencement of works,
- the authority of the Contracts Administrator to limit the contractor's use of plant and equipment on site during the construction,
- the need for the contractor to keep comprehensive and accurate employment records,
- the system for the recruitment of workers to be on a local basis as the construction progresses (e.g. village-by-village)
- the access of the Contracts Administrator to inspect labour records and payment sheets,
- the power of the Employer in the event of a default by the contractor in paying the workers' wages,
- the power of the Employer to deduct directly from the monies owed to the contractor any agreed repayment instalments for materials and tools provided to the contractor under the contract,
- the conditions covering the use of sub-contractors.

5.4 Specific Considerations

The following section discusses common clauses found in most general conditions of contract and their proposed application for the road rehabilitation works contracts in this project.

Bank Guarantees/Bonds

For contracts involving a major capital outlay by the contractor and significant financial risks to the Client, the following guarantees and bonds may be required:

- bid security,
- advance mobilisation payment security,
- performance bond, and
- maintenance bond.

The purpose of these is to reduce the risk to the Employer of sustaining financial loss in the case of a defaulting contractor at various stages of the contract. They are normally required in addition to the retention taken against payments due to the contractor during the progress of the works. Since they are all costly for the contractor (and thus ultimately for the Employer) they should not be included as a matter of course but carefully considered for each type of works to be undertaken.

For small-scale labour-based road works contracts:

- the need for initial capital is minimal (also when operating a tools and/or equipment leasing scheme),
- value of the projects is not large, nor are they complex,
- sectional completion of works is achieved, thus the Employer has use of the facilities as it progresses,

- work can easily be taken over by another contractor if one contractor defaults, since the costs and efforts related to mobilisation are minimal and can be carried out very quickly.

For the above reasons, the risks for the Employer can be assessed as low when engaging small-scale contractors for labour-based road works, and therefore no bonds and guarantees should be required.

Insurances

The amount of insurance and indemnity cover to be provided in a civil works contract is dependent upon the size and complexity of the works. The basic areas to be addressed are:

- insurance of works,
- third party insurance liability,
- workmen compensation insurance.

Due to the nature of works, it is recommended that the insurance of works is omitted and rather leave this risk with the Employer. Third party insurance liability and workmen compensation insurance would be necessary as these items are normally regulated by law.

Retention

In order to retain some financial pressure over the contractors' performance, a percentage (usually 10%) retention is held against payments, often reducing to a total 5% upon substantial completion to ensure that works are carried out to satisfactory standards. The retention is also a reserve/guarantee which the Employer can draw upon if the client chooses to engage a different contractor to carry out remedial works.

Retention monies also act as a performance bond and provide an incentive for the contractor to complete the works to the established standards and agreed time frame. In view of the small-scale contractors, it is recommended that this procedure is included.

Liquidated Damages

Liquidated damages are assessed as being the cost to the Employer of not having full use of the facility at the end of the contract period, due to delays caused by the contractor. Insisting on liquidated damages from small contractors with very weak financial abilities seems counterproductive to the intentions of this programme. Rather than using threats such as penalties on late completion, it would be more appropriate to provide the emerging contractors with the necessary support enabling them to complete works as programmed.

Arbitration

It is extremely unlikely that the question of arbitration will ever arise on any of the works contracts awarded under this project, since the proceedings are expensive and usually protracted. However, to cover all eventualities and to allow the option, a procedure should be included, and the documents examined do contain an appropriate clause.

Payment Method

The contracts need to contain specific and clear procedures for the payment of the contractor including how, by whom and when. In particular when dealing with labour-based works where wages constitute a major portion of the costs of the works, timely payment of the contractor will be crucial to the contractor's ability to pay the workers on time. For this reason, contractors should not have to wait beyond a reasonable period after submitting claims for payment. Payment schedule and processing time of payments should be included in the appendix to the conditions of contract.

Contractor Classification

There is a current exercise in NCIC to categorise and classify all private contractors in the country. It is already acknowledged that the petty and small-scale contractors emerging from this project will be considerably smaller than the firms which have so far been registered. Despite this, the NCIC still wishes to cover this part of the private construction industry and intends to accommodate their entry into their registries according to their particular size and competence.

A good indicator of sustainability achievement would be to monitor the NCIC's efforts and success in terms of further promotion of the services of this group of contractors outside the framework of the CRIMP. Future award of works to this type of contractors will very much depend on the road authorities' willingness to allot contracts of a value and content which matches the capacity of these contractors. The NCIC should be taking an active role in promoting this issue with the authorities representing major potential clients of work (i.e. NRA, MASAF, donors and district authorities).

Programme of Works

Most conditions of contract call for the contractor to submit a programme of works within a set time after being awarded the contract. This is to ensure that the contract period is being adequately addressed and that there is a measure against which progress can be assessed. Occasionally contractors are asked to submit a programme with their bids, but these are almost always rudimentary and of little value since the contractor does not wish to spend time on this unless awarded the works, when a programme becomes a serious practical issue.

Also for labour-based works, this is an important part of project planning, and the small-scale contractors should be requested to submit a programme of works, with particular attention made to the recruitment and organisation of the work force. However, considering the fact that the contractors in this project are new to these tasks, it is important that the project technical staff provides support to this task in the initial phase.

Contract Supervision

It is recognised that to be fully effective, labour-based construction needs to be very supervision-intensive, relative to both the Contracts Administrator and the Contractor. The efficient management and organisation of large number of workers to achieve the productivities and technical standard required is not an easy task since individual workers do not operate like programmed machines. With many workers on an extended site, a contractor's vigilance or his eagerness for maintaining standards may be questionable and since consistency of all operations is essential to the final product, close independent works supervision is usually unavoidable.

In addition, particularly for less experienced contractors, there is an advisory as well as instructional role for the Contracts Administrator to play. Contracts generally are moving away from a confrontational to a more cooperative approach (within the respective responsibilities) with the objective of improving the final product to everyone's interest. On labour-based construction sites there may be daily (some times hourly) changes in activities to meet different situations and a level of advice to the contractors should be welcome (without relieving the contractor of his responsibilities).

Day Works

On larger equipment-based contracts, it would be common practice to require the contractor to include a Dayworks Schedule with his bid, to show the basic costs of his labour, plant and materials together with the percentage overheads mark up, so that any work instructed by the Contracts Administrator on day works basis may be properly costed.

This item is not necessary for labour-based road works since:

- the road works operations are of simple nature,
- the use of machines is very limited,
- almost all work items are measurable, and
- de facto day works do operate when labour is employed and the contractor is paid under a miscellaneous or contingency item.

Variation of Price

The proportion of materials costs to the total cost of road rehabilitation works is generally very small so any variation of price applied to materials would have little significance. Also, if contracts are limited to less than one year's duration, labour and fuel increases should remain sufficiently stable for that period. In any event, there is provision in the contract for the contractor to claim for additional payments for a variety of circumstances, and a statutory rise in labour costs should be accommodated.

5.5 Routine Maintenance

Routine maintenance contracts are the smallest contracts envisaged in this programme. They will be of very limited value and consist of simple work activities, which require a minimum of equipment and technical skills. However, due to their large number and wide geographical coverage, it is important that the management procedures are simple and efficient, thus reducing the administrative requirements to a minimum.

For the above reasons, the contract documents also need to be kept at a minimum size with the main focus directed on the actual works to be carried out. The important aspect here is to achieve a performance based management system where works are paid for based on agreed quantities and actual measurements of completed volumes of work. Closely related to this aspect, is securing that correct standards are achieved using appropriate work methods.

In order to streamline and standardise the various stages of the road maintenance management system, a set of standard documents have been developed to establish an efficient and uniform practice for contracting routine road maintenance works.

Contracts documents for routine road maintenance works are proposed to comprise of:

- Labour-based Routine Road Maintenance Agreement,
- Annex A Duties and Responsibilities of the Contractor,
- Annex B Work Plan, and
- Activity Schedule and Payment Certificate.

In addition to these documents, a set of work activity descriptions need to be prepared in order to standardise the classification of works, the unit rates and the methods of measurement for payment. These descriptions are mainly targeted to the maintenance inspection personnel. It is doubtful whether this technical reference material will be of use to the maintenance contractors. Instead, it is recommended that the contractors are thoroughly briefed on the relevant contents of the activity descriptions which are covered by their contracts.

(i) Labour-based Routine Road Maintenance Agreement

The agreement provides the standard contract to be used when awarding a contract for routine road maintenance. It consists of one page, basically defining the parties to the contract and the location of works. It should be noted that this standard contract should only be used for routine maintenance works. When contracting out periodic maintenance works, the procedures established for road rehabilitation works should be applied.

A new Agreement is prepared every time a new petty contractor is recruited. When a contract is renewed in the case of contractor being awarded additional works along the same road section, the previous agreement can remain effective. In such cases, only the work plan in the contract needs to be revised.

(ii) Duties and Responsibilities of the Contractor

This form provides a summary of the duties and responsibilities of the two parties to the maintenance contract agreement. It also includes the exact number and type of tools issued to the petty contractor, and the prevailing labour wage rate. In the clause defining the duties of the contractor, it is referred to the Road Maintenance Management Manual for the detailed description of the work activities, implying that this manual actually forms part of all the petty contract agreements.

This form needs to be prepared every time a new maintenance contractor is engaged. In the case of a contractor being awarded additional works, the agreement remains effective, and if no additional equipment is issued, this form remains valid. In case the contractor is issued additional tools or returns some of the tools previously issued, then a new copy needs to be prepared.

(iii) Work Plan

This form provides the details of the quantities and location of the routine road maintenance works to be carried out under the agreement. In the case of a contractor being awarded additional works, the previous work plan is replaced with a new version detailing the additional works.

(iv) Activity Schedule and Payment Certificate

The purpose of this form is (i) to provide a summary and agreed price for all the works included in a maintenance contract and (ii) to certify payments of completed works.

In summary, the routine maintenance contracts would consist of a document containing four pages of standardised forms. Considering the sheer numbers of contracts required when organising routine maintenance contracts using small village based petty contractors, this arrangement should be regarded as the maximum paperwork allowed.

Chapter 6

Technical Issues

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6.1 Definitions

Road maintenance can be divided into three distinct categories, which are clearly defined according to their timing and nature of work:

- routine maintenance,
- periodic maintenance and
- emergency maintenance.

(i) Routine Maintenance

Routine Maintenance Tasks

- Clear side and mitre drains to allow free passage of water;
- Clear culverts and other water ways;
- Repair and replace scour checks;
- Repair, fill and compact pot holes and ruts;
- Erosion control of shoulders and slopes
- Perform minor repairs to culverts and retaining structures;
- Cut grass and bushes;
- Maintain road signs in place.

Routine maintenance of low traffic rural roads is a widely dispersed activity, requiring small resource inputs over a large number of widely separated points. The amount of work needed to keep a length of road in good condition depends on several factors, such as type of road surface, traffic volume (number, type and size of vehicles), the severity of climatic conditions, especially rain fall, type of soil; the susceptibility of the terrain and road gradients to erosion, and the presence of bush and vegetation.

Under average conditions, one full time worker should be able to cover the routine maintenance works each year of 1-2 km of earth or gravel road, with traffic of about 50 vehicles per day. This activity can be most economically performed by recruiting workers living in the vicinity of the roads. Local workers are also under social pressure from their neighbours to do the job well. Former road construction workers are ideal maintenance workers, because they already have some training and experience in the work involved.

(ii) Recurrent or Periodic Maintenance

Periodic road maintenance works involve activities such as reshaping of the road surface, re-gravelling and repair or reconstruction of damaged drainage structures. Such works could be organised the same way as rehabilitation and new construction works, works carried out by small-scale private contractors, and supervised and managed by staff of the district authorities.

Periodic maintenance is best identified during the annual maintenance needs assessment exercise. The required funds needs to be specifically budgeted for, as they are not part of the routine maintenance allocations. Forward planning for this component is important as periodic maintenance activities can be very costly. For example, the re-surfacing of a road can amount to as much as 30 percent of the cost of new construction.

(iii) Emergency Maintenance

This component is required from time to time when sudden and unforeseen damages occur to a road section. In most cases, this requires the deployment of additional resources beyond the regular budgets and work programmes. Emergency activities cannot be estimated during the annual maintenance needs assessment and no advance planning can be made. However, it is necessary to reserve a certain portion of the maintenance budget for emergency works.

Emergency maintenance normally consist of:

- repair or reconstruction of damaged cross-drainage structures due to excessive floods or over-weight vehicles,
- repair or reconstruction of damaged road sections due to wash-outs, excessive erosion, or floods,
- repair or reconstruction of damages to erosion protection, resulting from excessive flows of water or landslides,
- clearing of landslides, trees or rocks from the road carriage way.

(iv) Road Rehabilitation

Road rehabilitation is basically the full restoration of a road which has fallen into severe disrepair due to neglect and lack of timely maintenance interventions. Roads requiring full rehabilitation is often in a condition where it would not be economically feasible to provide any routine maintenance. In most cases, the use of this term also implies that the road was once built to proper engineering standards, as opposed to upgrading a track or constructing a new road. For this reason, the road alignment has already been established, some structures may still be intact and land issues have already been settled.

The work required to rehabilitate a road to a maintainable state is often the same activities as carried out during periodic maintenance works. The only difference may be that the volume

of works is normally larger and the initiative to commence such works is more often based on access to funding rather than systematic planning based on maintenance needs.

As opposed to new construction, the volume of works involved on road rehabilitation works vary along the road line, often confined to sections where the drainage system has collapsed causing severe damages to the road structure. Due to this, this type of works are often characterised as spot improvements.

Due to the character of the emerging small-scale contractors envisaged in the CRIMP, it is expected that the works will mainly be limited to vegetation control, earthworks covering reinstating the drainage system and finally reconstructing the road camber and surface.

6.2 Design Standards

Malawi has established geometrical standards for its main and district road network. However, it is expected that the project will also be carrying out rehabilitation and maintenance works on roads which do not belong to the gazetted network. These roads have been built using a number of different design standards which are not necessarily documented in any of the established technical manuals and training material.

In Malawi as elsewhere, any applied standards must be based on economic and technical considerations. The total rehabilitation needs are huge. Hence, functional standards need to be applied. These can always be revised upwards as the traffic increases and more funds become available, in a stage construction process.

On low-volume roads it will be important to keep the road design standards appropriate to the expected type and volume of traffic thereby not only limiting the rehabilitation works but also keeping future maintenance requirements at a minimum.

For this project, it is recommended that the maximum design standards applied would be the ones defined in the past for the DRIMP. However, it should be acknowledged that these standards were designed for the district road network. For roads which serve as village access roads with lower traffic volumes, reduced standards should be considered.

As a reference, the Malawi Social Action Fund (MASAF) have recommended the use of the DRIMP technical designs and work methods in its public works programme³.

Finally, the future recommendations of the MRTTP in their planned work of establishing geometrical standards for the rural road network should also be observed by the CRIMP.

For bridge works, it is recommended that the MoWS standards are used to the extent possible since these designs are already known to the district technical staff as well as a number of contacting firms. However, careful consideration should be given to alternative drainage structures. Instead of bridges, culverts, inverted culverts and drifts should be explored and incorporated where possible.

6.3 Work Methods

As Malawi was one of the first countries in this region to commence on district road construction and maintenance using labour-based work methods, this technology has already been developed to high standards. The work methods applied in the CRIMP should to the extent possible follow established practice in the country. This way, the project may benefit

³ Ref: Project Implementation Manual for the Public Works Programmes of MASAF

from the wealth of experience which has been accumulated in existing technical manuals and training material as well as the skills acquired by government technical staff which has been working with the various labour-based road works schemes in Malawi.

A very good technical reference for the rehabilitation works is the DRIMP technical manual. Although this document was produced already back in the 1980s, it remains highly valid, providing a detailed and well illustrated description of the work methods to be used in this project.

6.4 Identification and Prioritisation of Roads

The CRIMP technical staff has already experienced that there is a demand for an extensive mapping exercise in order to obtain a reasonable overview of the transport pattern in the target areas. Existing maps have not been updated for several years. New roads have been constructed since these maps were surveyed and the travel habits and demands of the rural population have changed.

The CRIMP technical staff has carried out a road mapping exercise in collaboration with the villages in the target area. As part of this exercise, the villagers were requested to indicate their most prioritised travel routes based on the type and reason for the travel.

In connection to this exercise, there will be a demand for preparing detailed road condition inventories, and also establishing the purpose of the roads, their relation to other important rural infrastructure such as markets, schools, churches, hospitals, etc.

Often when discussions are held with the rural communities regarding the formulation of a road works programme, emphasis is turned towards road construction works. In terms of formulating the road works programme under the CRIMP, it is important to bear in mind that this project contains a significant routine maintenance component. This implies that in order to meet the planned outputs of the project, this planning and prioritisation exercise will need to identify a significant number of roads in good or fair condition where routine maintenance can be effectively applied and where it proves to be a worthwhile investment.

Finally, it is recommended that strip maps are designed to visually present the findings of the road identification and planning exercise. These maps do not necessarily need to be produced to scale. Instead of going through the laborious process of producing exact maps, it is more important to prepare rough sketches which can then be presented to the villages for further planning purposes.

Using a standard vector-based computer graphics programme is an easy way of producing such strip maps, which can then be further edited and changed when new information and inputs from the road users are collected.

6.5 Recruitment of Labour

Before the contractors mobilise, it will be useful for the project to visit the villages along the roads where the works will take place. The contractors are expected to recruit their workers from these villages and an early notice to the villagers allow them to prepare themselves for work away from their normal economic activities and commitments.

It is important to emphasise that the workers are employed by the contractors and not by the government authorities, nor the implementing agency (in this case CARE) or the donor. This implies that any grievances relating to their employment should be primarily directed to and

settled with their employer, the contractor, and not with CARE or the district authorities.

However, it would still be useful to brief the villagers on the general conditions of employment which the contractors are expected to abide by. These include:

- the conditions of employment, i.e. use of incentive schemes and basic wage rates, working hours,
- duration of work,
- various parties to the contractor and the roles of the Engineer and the Client,
- benefits or the lack of them.

6.6 Incentive Schemes

Very often when developing small-scale contractors for labour-based road works, the question of most appropriate incentive schemes arise. Incentive schemes to motivate the workers is regarded as a key issue in terms of proper work site organisation as well as for obtaining acceptable production rates. In most labour-based public works programmes the use of task work has proven to be an effective way of organising the work force.

When introducing labour-based road works technology to private contractors, it is often queried whether piece work is a more effective way of organising the workers which may also enhance the profits of the contractors through higher production rates.

Experience have often shown that the use of task work is an effective way for inexperienced site supervisory personnel to quickly learn how to efficiently organise the workers on site. Applying task work forces the overseers to assign each worker to a specific location and amount of work for each day. When this task has been completed, the individual worker is entitled a day's wage and free to leave the work site. By this, each worker receive clear instructions on work duties and conditions of work.

While task work follow clear and simple routines, the use of piece work requires more effort from the overseers to supervise and control. Although it may provide higher production rates once it is efficiently organised, it is not recommended before the site supervisory staff have a full understanding of task work and show that they are capable of organising a site and its work force in an efficient manner.

6.7 Employment Conditions

The contractors will be regarded as a business entity operating in the construction industry of Malawi and therefore will be expected to adhere to the rules and regulations governing the employment of workers in this sector.

As opposed to various government and donor schemes dealing with emergency food distribution or pure poverty alleviation schemes, it would be natural to compare the employment of workers by the community contractors to any temporary employment offered by other private construction firms operating in the same area.

They will therefore be expected to comply to the minimum wage rate regulations prescribed by the Ministry of Labour for this category of work. It is therefore important that during their initial training, the contractors are made aware of the role of the labour ministry and keep

themselves updated on the minimum wage rate requirements and any changes made to them.

However, it should be stressed that the rates of the Ministry of Labour are only minimum requirements so the contractors, as well as the project management, will need to assess whether these are sufficient or whether other incentives are required to motivate the work force to achieve desired production rates. This is also an important issue to consider when budgeting and estimating the works.

Chapter 7

Training

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7.1 Introduction

Labour-based road works are often underestimated and seen as a simple technology which does not require high technical and managerial knowledge. In fact, it is the contrary as labour-based methods require effective supervision and detailed technical knowledge. The standard of the final product achieved using appropriate technology needs to be of the same, if not higher, quality as would be achieved using conventional equipment-intensive methods in order to avoid that labour-based works schemes are merely regarded as an employment/feeding programme. Management of a large number of workers is a demanding task which require certain specific skills.

During this assignment, two specific training related activities were carried out:

- conduct of a training of trainers workshop for rural road rehabilitation and maintenance works using local small-scale contractors, and
- design of a training programme for the development of local small-scale contractors for rural road works using labour-based methods.

The contractor training programme described in this section defines a general model which has been successfully applied in other rural infrastructure development programmes where domestic small-scale contractors have been involved, using labour-based road works technology.

This training programme focuses on practical skills training in the expected work environment of all the involved parties, covering both staff from the private contractors as well as from the government agencies at district level.

7.2 Training of Trainers Workshop

The training workshop was targeted primarily to the staff of the MoTPW Training Centre and the project technical staff, but also inviting key partners such as MASAF, NCIC, NRA and the district authorities.

The purpose of this workshop was to:

- (i) present in detail the contracts management procedures developed by the consultant,
- (ii) to review the technology and work methods to be used by the contractors and
- (iii) finalise the course programmes for the various cadres of staff involved in the road works.

A detailed programme for the workshop and the list of participants are found in Annex 5.

After this workshop, it is intended to use the Training Centre to carry out detailed training of the contractors, their supervisory staff as well as the district and project staff involved in contracts management activities.

7.3 Purpose of Training

The training will concentrate on skills development specially required for the planning, execution and supervision of the envisaged road rehabilitation and maintenance works carried out by local contractors. Training will include both government staff and personnel from the contracting firms, ranging from general management to site supervisory staff.

The objectives of the training programme are to:

- Establish a cadre of domestic contractors capable of undertaking road rehabilitation and maintenance works using labour-based methods. This implies that the firms are fully conversant with the technology, contract management, business administration and supervision of labour, tools and materials;
- Create a capacity within the government to plan, manage and supervise road works carried out by local contractors using labour-based methods;
- Develop the local capacity for training government and private sector staff in the use of labour-based rural road rehabilitation and maintenance technology.

The key concept is to provide training through a combination of formal and on-the-job training. Technical assistance should be made available to provide advice, guidance and training in all aspects of the implementation of the programme in order that the key players of the project will be fully conversant with and capable of supervising and administering the works in the future. In so doing, they will also actively participate in identifying constraints in the system in order that effective measures can be taken to rectify and improve the situation.

7.4 Strategy

In order to achieve the above objectives, training should be provided to:

- (i) technical staff including project engineers, planners, technicians, supervisors and contracts administrative staff,
- (ii) district staff including senior managers, planners and coordinators,
- (iii) contractors' staff including the managers and their supervisory staff, and
- (iv) representatives of the local communities, policy makers, planners and administrators.

The training for the various categories of staff should be carried out with varying durations and through different approaches, such as on-site and classroom training, workshops, seminars and practical on-the-job training. The main training audience is identified in the table below:

Categories	Performance Requirements
District Road Supervisors and Project Engineers	<ul style="list-style-type: none"> • To be capable of carrying out overall planning, management and monitoring activities related to rural road rehabilitation and maintenance. • To be capable of preparing and supervising rural road maintenance and rehabilitation contracts.
Small-scale Contractors	<ul style="list-style-type: none"> • To be capable of organising and carrying out rural road rehabilitation works using labour-based methods. • To be capable of successfully managing contracts and the company's business, and the ability to organise and control all required assets. • To know how to acquire labour-based road work contracts including all tendering and pricing procedures.
Maintenance Inspectors	<ul style="list-style-type: none"> • Able to effectively plan, organise and manage routine maintenance of rural roads carried out by local petty contractors using labour-based work methods. • Capable of providing detailed on-the-job instruction and supervision to petty contractors carrying out routine road maintenance.

7.5 Training Needs

(i) Small-scale Contractors

In terms of the small-scale contractors for the road rehabilitation works, their work experience and formal training background needs to be identified through interviews with the contractor candidates and the staff they select. The detailed content and extent of a training programme can therefore only be finalised once the final screening and selection of the contracting firms have been carried out. However, at this stage it is possible to identify the main topics which need to be included in a training programme.

It is expected that the emerging contractors will have a limited background and experience with managing a large group of workers as well as carrying out rural road works. Furthermore, the project will be introducing the concept of contracting as a subject which will be new for all parties both the contractors as well as the staff in charge of managing the contracts.

The training needs are not an isolated one-time exercise at the launch of the project. It needs to be continuously assessed during project implementation. The purpose of the initial training will be to get the physical works started. Thereafter, on-the-job training and additional refresher courses need to be arranged to cover areas where the various operators show weaknesses in their respective performance.

(ii) Petty Contractors

For the petty contractors intended for the routine maintenance works, it is proposed that training is carried out entirely through practical on-the-job training and detailed instruction provided by the maintenance inspectors.

Although this group may not require formal classroom training, this task should not be underestimated. It is important to bear in mind that this group will be recruited from the part of the rural population where the expected academic levels are among the lowest. This implies that the training delivered needs to be practically oriented and mainly be based on oral instructions and timely and regular follow-up of their work.

(iii) Maintenance Inspectors

Despite the fact that routine maintenance cover far simpler work activities than the rehabilitation works, it is important that the maintenance inspectors fully appreciate the functions of the various components of the road structure, and in particular the drainage system. Without this level of knowledge, it will be difficult to delegate the responsibility for the regular maintenance of the roads to this cadre of staff.

The maintenance inspectors would need proper training in road works technology, at the same level as the rehabilitation contractors. Equally, their exact training needs can only be determined after appropriate candidates have been identified. Some may have previous experience in labour-based road works technology, while others may be entirely new to this field and require a more comprehensive introduction.

Furthermore, the inspectors will also be in charge of activities such as the assessment of maintenance requirements, preparation of new contracts, supervision of works and issuance of payment certificates to the petty contractors. All these activities follow new procedures introduced through this project, and will therefore require specific training sessions.

(iv) District Road Supervisors

The district road supervisors already possess a proven track record in the field of labour-based road works technology. It is expected that minor additions are required in this field. The main training requirements for this group is in the field of contracts management. Their past work experience has always been in a force account environment so they now need to be retrained in their new role as contracts managers.

(v) District Administrative and Financial Staff

The district authorities need to be trained in their newly assumed role as the client of the road works. Most importantly, this implies that they need to be fully conversant in the obligations as stated in the conditions of contract, particularly in terms of timely payment of the contractors. In relation to financial management, they will need to possess the skills necessary to account for the funds, and ensure that there is a timely flow of funds to the district to meet the financial commitments taken on by awarding works to local contractors.

(vi) Project Engineers

Lastly but equally important, there is a considerable training demand among the project engineers, i.e. the technical coordinators and the field advisers. Although this group possesses the best academic qualifications, they are new to rural road works technology and the use of labour-based methods. In order for them to act as the resource base as planned and enabling them to provide the intended technical and managerial support, it is important that training is provided in the field of (i) labour-based road works technology and (ii) contracts management for such works.

7.6 Methodology**On-the-job Training**

It has been proved over the years in a number of countries that on-the-job training is the most effective tool for training most categories of government and contractor's staff. This approach should also be used during this training programme, carried out through demonstration and practice at training sites. This approach can be used for managers, engineers, inspectors and supervisors with the on-site training being supported by classroom components tailored for the various categories of staff.

Practical training sessions should consist of two distinct methods, first where specific skills are practised in a model environment, and secondly in a real situation. The initial classroom training will need to be supplemented with practical skills development sessions with the focus on demonstrating techniques and work methods such as surveying, setting out, defining work tasks and geometrical standards.

After the initial classroom training and skills development sessions, further practical training should be carried out on a full-scale demonstration site. The training/demonstration site should be fully equipped with the same type of hand tools which the contractors will be provided with once they have successfully completed the training course.

Classroom Sessions

Although the training needs to focus on practical skills which are best taught in the field, there is always a demand for a certain theoretical foundation on to which the practical skills are placed. Experience show that it is useful to review basic arithmetic and geometry which in the next turn is explained in the context of road works technology.

Also for topics such as drainage, soil mechanics, setting out methods and other technical subjects, there is a demand for an introduction to the subjects in a classroom before the field training sessions commence. Furthermore, practical sessions on estimating and tendering are best carried out in a classroom environment.

Short Courses and Workshops

Intensive refresher courses for periods of one to three days should be organised to supplement on-the-job training for some of the technical and administrative staff. It should also include independent courses for other staff categories such as storekeepers, accountants, pay clerks and administrative staff. Such training should be possible to organise in collaboration with the MoTPW Training Centre, once all administrative and financial procedures have been decided upon.

Furthermore, short-courses should be arranged for the contractor in subjects related to business management such as book-keeping, banking services, calculation of profits, etc.

Seminars

Awareness Creation for Programme Managers/Stakeholders	
Course Objectives:	
<ul style="list-style-type: none"> ● Disseminate information on progress of work and effectiveness of project strategy ● Provide further work prospects for the contractors 	
Contents:	
<ul style="list-style-type: none"> ● choice of technology ● policy framework ● the change from force account to contract operations ● performance of petty and small-scale contractors ● the role and organisation of the client and the contract administrator ● lessons learnt ● potential for replication and expansion 	
Target Audience:	
<ul style="list-style-type: none"> ● Government authorities involved in the road and transport sector, (i.e. MASAF, NRA, NCIC, MRTTP, District Assemblies) ● Donors and NGOs involved in the road sector ● Representatives of the domestic civil construction industry 	
Training Materials:	
Project progress reports, excerpts of training material, photos of on-going and completed works, brochures, results of impact studies, sample contract documents, etc.	
Duration:	No. of Participants:
1 - 2 days	15 - 30

Seminars should be organised as a means for dissemination of data and information, in particular to senior government officials at central and district level, as well as representatives for other government agencies, donors and the private sector.

Thus, seminars can be a useful platform for policy makers, planners and administrators to review the implications of domestic private sector participation in rural road rehabilitation and maintenance works carried out by labour-based methods. The project outputs may also have implications for other parts of the road network (i.e. main roads) as well as other sectors.

Equally important, these type of seminars are important in terms of creating an awareness in the road sector of the potential of utilising these new contractors for works beyond the boundaries of this project, and thereby preparing for future work prospects for the emerging contractors.

7.7 Curricula

The envisaged training package consists of the following three major elements:

- planning and execution of labour-based road rehabilitation and maintenance works,
- contract management, and

- business management.

The training courses should be based on existing literature already developed during previous rural road works projects, compiled and adjusted to the specific needs related to the private sector involvement. The training programme should also utilise the literature developed during this assignment, covering planning and contracts management for rehabilitation and routine maintenance works. Finally, it is proposed that training materials developed by local institutions specialising in business management for small enterprises are utilised in the business management topics.

(i) Labour-based Road Works Technology

This topic should constitute the major part of the training programme. Although the contractors may recruit site supervisory staff with past experience in this field, some managers and supervisory staff will through this training receive their first introduction to labour-based road works technology. The curricula for contractors which will be engaged in labour-based road rehabilitation works should cover the subjects as outlined in table below.

Subject	Contents
Planning	how a labour-based road works programme is planned at different levels, planning responsibilities of the various levels of staff, work plans, organising site camps, planning of tools, and the recruitment and organisation of casual labour
Reporting	administrative control of a work site, production and quality control
Work Organisation	sequence of labour-based work activities, gang balancing, instruction and supervision and incentive schemes
Tools	selecting appropriate tools, how they are handled, their use and maintenance and store-keeping
Survey and Setting Out	setting out horizontal and vertical alignments, cross sections, curves and how to use various setting out equipment such as profile boards, templates and string line levels
Clearing	clearing the alignment of vegetation and boulders
Drainage	the vital importance of a well functioning drainage system, how to construct side and mitre drains, road camber, catchwater drains and scour checks
Earthworks	how to measure and estimate earth works carried out by labour, the organisation of excavation, levelling, hauling, loading, unloading, filling and spreading, compaction and erosion control
Compaction	presents simple soil mechanics, optimum moisture content, indirect compaction, direct compaction and the effective use of hand rammers
Gravelling	how to organise gravelling operations, and testing of gravel quality
Maintenance	the organisation and implementation of the various activities on labour-based routine, periodic and emergency road maintenance, and the required tools and equipment
Structures	rehabilitation and maintenance of small bridges, drifts, causeways, culverts and box culverts

This training is also recommended for the maintenance inspectors, district road supervisors and the project engineers. Further details on the course contents within this subject are found in Annex 5.

During the training of trainers workshop, this technical training was reviewed in terms of the specific needs of this project and the required course durations. The findings of the participants at the ToT workshop are summarised in the table below:

Road Rehabilitation Works

Subject	Class-room and demonstrations	Field Training
Basic Arithmetic	2.5 days	
Site Organisation	0.5 days	1 day
Work Organisation	0.5 days	1.5 weeks
Design Standards & Construction Methods	4.0 days	1 week
Road Drainage	2.5 days	0.5 week
Surveying and Setting Out	3.5 days	1 week
Road Condition Surveys and Estimating	5.0 days	
Reporting and Monitoring	1.0 day	
TOTAL	19.5 days	4 weeks

After the maintenance inspectors have participated in the above road rehabilitation course, it is proposed that a separate course is provided for this staff covering in detail routine maintenance of rural roads. Similar to the above table, the required duration and key topics were reviewed during the ToT workshop, which summarised the maintenance course as shown in the table below:

Routine Road Maintenance

Subject	Class-room and demonstrations	Field Training
Planning, Road Condition Surveys, Work Programming, Description of Activities	2 days	2 days
Contracts Preparation	2 days	
Instruction, Measurement and Certification of Works	2 days	2 days
Reporting	1 day	
TOTAL	7 days	4 days

A tentative course programme for the routine maintenance course is shown in Annex 5.

(ii) Contracts Management

One of the outputs of this project is to develop contractors able to deal with all aspects and phases of contract management, from estimating and tendering to claiming payments for completed works. Equally, the district authorities in their new roles as Client and Contracts Administrator need to be trained in the effective management and supervision of the contractors.

This training should be offered to the staff as outlined in the following table.

Subject	Responsibilities	Trainees
Contract Management	bidding and submission, unit rates, estimating, tender preparation, contract documents, condition of contract, claims, payments	Small-scale contractors
Contract Preparation and Supervision	estimating, tender announcement, bid opening and evaluation, contract conditions, claims, preparation of payment certificates, processing payments, work inspection, contract administration	District Road Supervisor, Maintenance Inspectors', Project Engineers and district administrative and financial staff

Note: For the maintenance inspectors, training in contracts management will cover the procedures developed for routine road maintenance works.

Although the various groups of trainees will have different responsibilities as related to contracts management, it is useful to provide the training in all the subjects as mentioned in the table above to all staff as a group. This will create a greater understanding among the participants of what are the obligations of each of the parties to the future civil works contracts.

(iii) Business Management

The contractors will require training in general management issues related to the daily running of a construction company. It is therefore proposed that the road rehabilitation firms are offered short-courses in essential aspects of management such as book-keeping, accounting, marketing, office work and planning.

Subject	Contents	Trainees
Business Management	bookkeeping, profits, budgeting, cost control, cash flow planning, material purchase, personnel management, banking, taxes, labour regulations	Contractor Managers and Project Engineers

This component is best sub-contracted to a local business management institute. Appropriate training courses for this size of business entities have already been developed by the Malawi Entrepreneurs Development Institute.

7.8 Training Programme

Pre-training Phase

It is vital for the success of the training programme that the participants know exactly what will be required of them and what they can expect to gain. This is particularly important in the case of the small-scale contractors which during the training period must make them self and key staff available for the period of training. Arrangements need to be made for this staff in terms of costs for accommodation, training materials and allowances. In addition, these persons may be engaged in other economic activities and have other commitments to fulfil. Therefore, they must be provided with a precise timetable for the training so that they can programme other commitments accordingly.

The project management will need to explain the strategy and action plan for the small-scale contractor development programme from the training stage through the first trial contract to final graduation and future works. This could be arranged during the final screening of the contractors' staff in advance of starting the training activities.

The complete training package for the small-scale contractor development can be described in three distinct phases:

Phase I: Demonstration Phase

During the demonstration phase, the project will still be in charge of the road works. A training site should be established for on-the-job teaching purposes, where the contractor's staff are seconded to the various operations under close guidance of experienced district staff and instructors.

This phase is particularly important for training in effective work organisation. The main feature of labour-based works is the employment of a large work force. This places very specific performance requirements on the site supervisory staff in terms of personnel management. The best way of training supervisors in work organisation and supervision is to actually organise a full-scale work site where real conditions prevail.

By allowing for this training phase, it has shown that the trainees are in a better position to perform their duties once they embark on the trial contracts.

Phase II: First Trial Contract

After the demonstration phase, each contracting firm will be given an initial trial contract consisting of approximately 3 to 4 km of road rehabilitation works which will be executed under close guidance of the project technical personnel and instructors. At this stage, the responsibility for the work sites is transferred to the contractors, however, in a safe environment where the instructors still closely monitor and provide advisory support to the contractors, thereby avoiding errors and sub-standard works at an early stage.

Ideally, it would be preferable to award trial contracts to all contractors in the first training batch simultaneously, after successful completion of the demonstration phase, thereby maintaining the momentum gained during the initial training. However, due to the demand for intense supervision and support during the initial stage of the first trial contract (site organising, establishing proper logistics procedures, etc), it is recommended that the contracting firms are split into two groups, first awarding trial contracts to four firms at the time. Practically, this should be done by first starting with four contracts, and then two weeks later, after the first batch are up and running, initiating the remaining four contracts. This will enable the project staff to concentrate their area of operation during the initial phase of the trial contracts, and avoid lengthy travel distances for site inspectors and instructors during the time when support is most needed.

Phase III: Second Contract

When the contractors have successfully completed their first trial contract, they are awarded contracts of 6 - 8 km of road rehabilitation works. At this stage, the contracting firms will not have access to the close technical support rendered by the project during the trial contract, however, some technical assistance will still need to be provided.

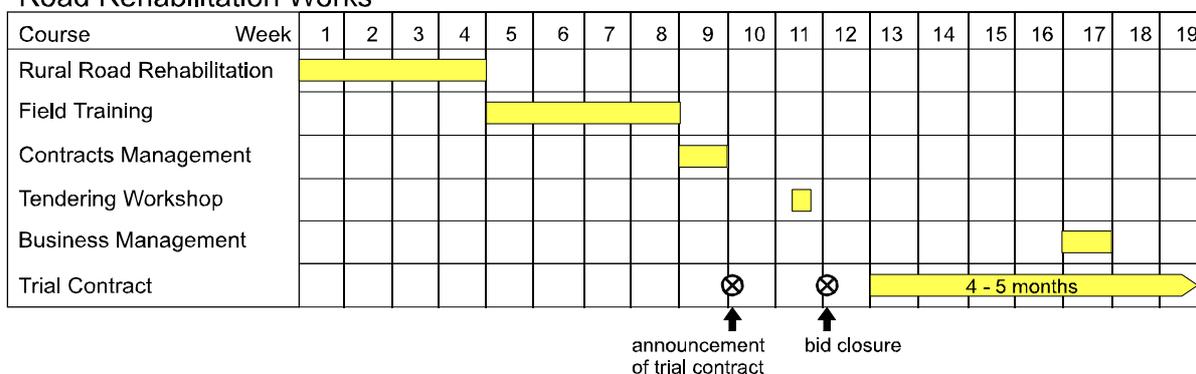
The time schedule for the above described training and development programme will depend on the capacity and performance of each of the contractors. It is expected that the first trial

contract can be completed in four to five months and that the second contract will require a period of eight to ten months.

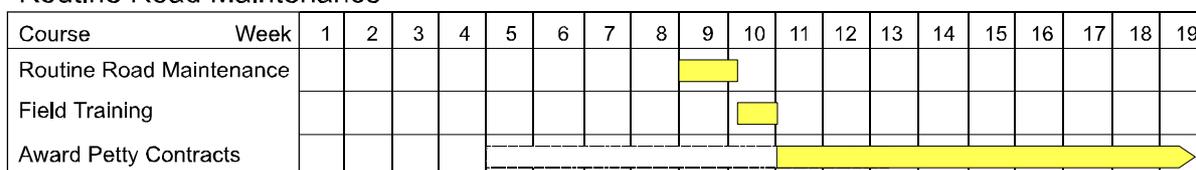
Timetable

The timetable described in the following section was prepared in collaboration with the key partners of the programme during the training of trainers workshop. All the subjects mentioned in the timetable were reviewed in detail during this workshop. At the end of each review session, their key features in terms of course objectives, contents, target audience, duration and training methods were formulated. As a final exercise, the participants of the workshop compiled the various course modules into a comprehensive training package with the resulting timetable described below.

Road Rehabilitation Works



Routine Road Maintenance



Since both the rehabilitation and the routine maintenance component involve training in labour-based road works technology, it is proposed that a common road rehabilitation course with the main focus on the contractors and the maintenance inspectors is arranged first.

After this course has been completed, the maintenance inspectors should follow a separate course for the management of routine maintenance works. As indicated in the timetable, some petty contracts should be awarded by the district road supervisor before the maintenance training commence, thereby securing a field site for the practical field training for the maintenance inspectors.

At the same time as the maintenance inspectors are receiving training in road maintenance management, the small-scale contractors receive training in contracts management for road rehabilitation works.

At the end of the contracts management course, the first trial contracts for rehabilitation works are announced. The trained small-scale contractors should be allowed two weeks to prepare their tenders. During the second week of the tendering period, it is proposed to arrange a tendering workshop, where the training staff is once again made available to the contractors. The purpose of this workshop is mainly to provide the contractors with some

assistance in bid estimating and proper preparation of tenders thereby avoiding that their tenders are found incomplete during bid opening and evaluation.

If the tenders are found in good order and prices are acceptable, the first trial contracts could commence in Week 13 of the training programme.

Finally, once the small-scale contractors have completed classroom and practical training, they should be provided the business management training after they have commenced on their first trial contracts.

7.9 Trainers

In order to sustain project efforts in the field of training, it is crucial that the training capacity is fully institutionalised in the country. To achieve this goal, there is a demand for a structured plan for the involvement of local trainers.

From the start, a number of trainers should be permanently attached to the training programme. During the Training of Trainers Workshop, they were prepared to take over responsibility for the training of the contractors as well as the district staff, and cater for a future expansion of labour-based road works technology using contractors to other projects and areas. This will enable the government, with minor external assistance, to take the lead in conducting further courses.

As part of this exercise, the training centre should also be involved in the trial contract phase, providing the contractors and contract managers with follow-up assistance during the stage when they put their newly acquired knowledge into practice. This solution is not only an additional service to the trainees. It also provides valuable feedback to the instructors in terms of the quality and effect of the initial training phase.

(i) MoTPW Training Centre

From the DRIMP project, there is already a well established training capacity within the MoTPW Training Centre in the field of labour-based road works technology. Currently, the training centre employs three trainers who possess solid experience from implementation of labour-based road works as well as having taught the subject for several years. Due to the current reorganisation in the road sector, however, it is uncertain how the Ministry will continue its training services. Through the establishment of the NCIC, there is now a second institution involved in road works technology training. At the moment, the NCIC relies on the MoTPW and its trainers for the conduct of these courses.

So, despite the uncertain future of the MoTPW Training Centre, there is through the NCIC an in-country institution with a clear mandate and commitment to continue providing this type of training.

It has been agreed that the CRIMP training programme will be carried out in close collaboration with both these institutions.

(ii) District Road Supervisors

For on-the-job training, in particular during the trial contracts, it is expected that the District Road Supervisors will play an important role in terms of instructing the contractors on topics such as work standards and methods, site organisation and quality of works. Due to their long

experience in this field, it is expected that they can provide the project with a good reference on what is the expected level of quality using labour-based road works technology.

(iii) Maintenance Inspectors

For routine road maintenance using petty contractors, formal training will be focused on the maintenance inspectors. To ensure that the petty contractors are performing their work efficiently and according to the prescribed quality, the maintenance inspectors are expected to provide them with the required on-site training and instruction. When dealing with contractors without prior experience in this field, an important task of the contract administrator will be to ensure that the contractors are properly briefed and fully knowledgeable in the various work activities before they commence work. Therefore, all contract supervisors will need to spend considerable time and effort into ensuring that when works commence, it is carried out the correct way, according to the established geometrical and quality standards and organised in an efficient manner.

Due to lacking literacy levels among the petty contractors, the maintenance inspectors are also expected to thoroughly brief these contractors on the contents and conditions of their contracts.

(iv) Project Technical Staff

Finally, but equally important is the project technical staff which will play a central role in providing technical and managerial support to all parties involved, both the Client, the Contract Administrators and the Contractors. Since the management procedures in this project are new to all parties, it is expected that the project staff can act as a valuable resource base in terms of ensuring that contract procedures are adhered to, and assisting the various parties to the contract in fulfilling their respective commitments and duties as defined in the contracts.

In this context, it is important to note that the project staff should not be seen as merely an additional representative of the Client, but instead provide support and assistance also to the contractors, thereby ensuring smooth progress and achieving the deadlines and quality workmanship defined in the work programmes.

7.10 Training Material

(i) Routine Maintenance Works

Very limited material has been produced on routine maintenance works which is specific to the conditions of Malawi. The DRIMP covered this topic in one of the chapters of its technical manual, mainly focusing on the work contents. Since this literature was based on a lengthman system, it has limited relevance to the setup in the CRIMP.

The other document covering road maintenance is the Operations Manual for Foremen and Supervisors for the MoWS Maintenance and Rehabilitation Management System. This document was produced for the Roads Department of MoWS back in 1986, also based on force account with maintenance depots carrying out the road works.

For the reasons above, the consultant has prepared a purpose specific management manual for routine maintenance of rural roads using labour-based methods carried out by petty contractors.

This manual basically covers three sub-topics, (i) defining the various components of road maintenance and an effective strategy and organisation which address the maintenance requirements of rural roads, (ii) contracts management for routine maintenance using petty contractors, and (iii) planning and reporting for the execution of routine road maintenance.

In addition, it is recommended that the International Road Maintenance Handbooks produced by the Transport and Research Laboratory in England, are used as reference literature for the maintenance inspectors. In the latest edition of these manuals, the use of labour-based methods have been fully incorporated.

(ii) Rehabilitation Works

The training in labour-based road works technology will be based on the DRIMP technical manual and the corresponding training materials designed by that project. Although the DRIMP project was based on force account operations, the technology remains the same, although new management issues related to the involvement of private contractors need to be taken into consideration.

The advantage of utilising the existing training materials is that the training staff as well as district technical staff will then be relating to existing and well established standards and work methods in which they already possess a considerable proficiency and experience.

Rather than introducing new work methods and standards, it is strongly advised that the CRIMP project taps into this well known technology which is already established in Malawi.

Involving the private sector in rural road works is, however, a new component for the various players in the CRIMP project. As reference literature for the training required in this topic, it is proposed to utilise the Contracts Management Manual for Labour-based Road Rehabilitation Works, developed by the consultant during this assignment. This manual describes in detail the contracts management system proposed for the road rehabilitation component, including sample documents with detailed instructions covering all stages from contract preparation, tendering, award, supervision and payment of works.

7.11 Logistics

During the training sessions at the MoTPW Training Centre, trainees from the districts will need to be provided with accommodation, meals and allowances for incidental expenses. It is highly recommended that the trainees are lodged and catered for at the Training Centre, thereby avoiding excessive transport demands. Equally, the trainers and other resource staff will need to be compensated in an appropriate manner to ensure their full commitment to the training programme.

Effective transport arrangements will also be required during practical field training sessions. When carrying out training sessions in topics such as road condition inventories, transport will need to be arranged from the Training Centre to roads where such surveys can take place. Also, when the maintenance inspectors receive practical training in management of petty contractors, transport is required during site visits.

During the demonstration phase, when the trainees are assigned to carry out field training, it is recommended that both the trainers and trainees are accommodated close to where the demonstration site is located. One of the identified roads for rehabilitation in Dedza District

seems feasible for this purpose, since good accommodation can be found close by in Dedza Town. During this period, transport needs to be properly planned and provided for. During the demonstration phase, it would also be useful to establish some training facilities such as a classroom with a blackboard in close vicinity to the demonstration site. A meeting room at the District Assembly could adequately serve this purpose.

Chapter 8

Further Action

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8.1 General

With the completion of this assignment, the project is now at a stage where the detailed planning for implementation of physical works can take place, as well as finalising the identification of suitable contracting firms which show interest in participating in the training/development programme. The following outlines the activities remaining at this stage before road works can commence. Due to the specifics of the works, as well as the type of contractors required, it is useful to divide the continuing plan of action into two distinct components, one covering routine road maintenance works and the other covering road rehabilitation works.

8.2 Routine Road Maintenance

Although routine maintenance is often given low priority, this component is by far the easiest to start implementing. Following the training of trainers workshop, it is now time for finalising works in terms of identifying the maintainable road network in the project area. Equally as with the rehabilitation works, the immediate step is to prepare a road condition inventory for the sections of the network which appears to be maintainable, i.e. which does not need any substantial rehabilitation before routine maintenance is applied. In this context, it is important to bear in mind that the petty contractors possess only a small amount of equipment, basically limited to hand-tools. Equally, they are also small organisations, say with 10 to 15 workers, which limits the daily output of each of the "firms".

It is advised that the district authorities first allow a batch of work to say 4 to 5 petty contractors on the road sections in the best condition, using these first contractors as a management trial exercise. Once this seems to be operating smoothly, i.e. the first petty contractors have received sufficient on-the-job training, additional contractors can be awarded works on other parts of the road network which is in good condition.

For the first "trial maintenance" contracts, it is recommended that the District Road Supervisors carry out this together with at least one of the MoTPW Trainers. This allows the trainers to acquire some practical experience before the training of the Maintenance Inspectors.

In Dedza District, it is recommended that maintenance works commence as soon as possible. The District Road Supervisor has already received sufficient training in the new system during the Training of Trainers Workshop to commence routine maintenance work. With some support from the Technical Coordinator and the District Road Foreman, the initial petty contracts can be awarded before the Maintenance Inspectors have completed their training.

In certain areas it may prove difficult to identify road sections in a maintainable condition. Although the road sections may need full rehabilitation, it may prove useful to engage petty contractors at first to clear the bush and remaining drainage structures before a full rehabilitation assessment is carried out. Due to several years of lacking maintenance on some of the identified roads, it will be useful to commence bush clearing before a detailed road condition survey is carried out.

8.3 Rehabilitation Works

(i) Final Selection of Contractor Candidates

The initial screening of contractor candidates have already been completed. The next step is now to carry out more detailed reviews of the candidates which at this stage seems most appropriate and best qualified. An important part of this review will be to conduct interviews in order to establish their prior experience, interest and commitment to this programme.

These interviews should also be used for carrying out a final assessment of the training needs of the contractors' staff. Before the contractors arrive for these interviews their staffing plan for both the training phase and later contracts works should be finalised.

The final interviews also provide a good opportunity for presenting the key requirements for the selected candidates, the training programme and under which conditions it will be offered. An obvious prerequisite will be that all selected candidates provide the correct staff which will participate in the training.

It is important that the selected candidates know in advance what is required from them during the training, thereby allowing them to make adequate arrangements to make their staff available during this period. Furthermore, they will need to know the financial implications of participating in the training. Participants to the training is the managers of the contracting firms and the overseers who will be employed by the contracting firm.

The final selection should be carried out together with representatives of the future Clients for the works contracts. In order for the contractors to receive the intended recognition as qualified firms for this work, it is important to fully involve their future clients at this stage. This secures the full commitment of the relevant authorities at an early stage and recognises the training as a means of obtaining a classification for the participating contractors.

(ii) Conduct Training

Training should commence immediately after the final selection of the contracting firms. Preferably, the contractors should be informed of the date for commencing training at an earlier stage, thereby allowing them to release their staff at the correct time, ensuring that the

training programme does not conflict with other works activities and commitments of the trainees.

(iii) Road Condition Inventories

At the same time as the training is being carried out, it will be necessary to carry out road condition surveys, which will form the basis for the preparation of bills of quantities for the first trial contracts. This is a fairly time consuming exercise, in particular since this is the first time the district and project staff carry out this exercise.

It is important that this work is done at a high degree of accuracy, thus avoiding any major changes in the quantities of work once the contracts have been awarded and the contractors commence works.

These surveys should be carried out as close as possible to when the works are expected to start, thereby avoiding that any wear and tear from weather or traffic causes any major changes to the condition of the road before the contractors are mobilised.

(iv) Prepare Bill of Quantities and Engineer's Estimate

Bills of quantities are prepared on the basis of the volumes of work from the road condition surveys. The bills of quantities are based on activities as described in the contract works specifications.

Appropriate unit rates for the Engineer's Estimate, need to be established in advance of the preparation of tender documents for the first trial contracts. This is best carried out by organising a workshop for the district road supervisors and project engineers, during which the correct application of the works specifications are once again reviewed and appropriate production rates, costs of tools and equipment, supervision and profits are agreed upon - all components which need to be included in the unit rates.

The engineers should thereafter prepare the detailed engineer's estimates for the first trial contracts. Once these estimates have been verified and approved by the district road supervisors, the contractors can be invited to submit tenders. In addition to providing valuable practical training, this exercise is important in order to introduce uniform practices among all the technical staff in terms of quantity surveying and cost estimation.

It is recommended that all the trial contracts are located in a limited geographical area, preferably sections along one road. This reduces logistical constraints for the district and project staff during the supervision of the first works carried out by the contractors. It is important to bear in mind that the first contracts are still a part of the training programme and for this reason it is important that trainers and project technical staff have easy access to site, enabling them to provide the highest degree of support to the emerging contractors.

(v) Invite Trained Contractors to Submit Bids

As part of the training process, the contractors are invited to submit bids on a set of trial contract packages, upon successful completion of the initial training.

This invitation should be combined with a two-day workshop where the bidding procedures are reviewed. Main topics covered during this workshop would be the procedures for tendering and how to calculate appropriate unit rates for labour-based road works. Although this information has already been covered during the initial training phase, it has proved to be

very useful to repeat it immediately before the contractors prepare their first tenders.

A major concern for the contracting firms during the first bidding rounds, will be their lacking experience in terms of costing civil works carried out by labour-based methods. For this reason, it is useful for the project to provide this exercise, and provide the contractors with detailed cost figures from previous works carried out in Malawi (through the district road supervisors).

(vi) Open and Evaluate Bids

During bid opening, it is a useful exercise to request each of the tenderers to further clarify the calculation details on which their unit rates are based. This is a last verification whether the contractors have properly understood how unit rates are calculated (i.e. based on costs of labour, tools, supervision, profit, etc.).

Since the first bid opening is a first time experience for both the client and the contracting firms, this event should be given high priority in terms of participants. It is part of the training process for all parties and for that reason should be attended by all staff involved in preparation, award and supervision of contracts - both from the Employer and the contracting firms. In this respect, it is important that the contractors are represented by the persons who actually prepared the bid, i.e. the manager and the overseer.

Secondly, this event is also used for clarifying uncertainties in the bids and correcting clerical errors and arithmetic mistakes. For this reason, it is important that staff from both parties with sufficient authority and technical qualifications are present to address such issues.

(vii) Award First Trial Contracts

Upon the award of the first trial contracts, the contractors should be instructed to prepare a work programme which needs to be approved by the Contracts Administrator before they commence works. It is useful to set a fairly short deadline for this exercise - say one week, and thereafter allot some time for reviewing these plans. Experience show that these plans are fairly thin when prepared the first time and would need some technical support from the project staff before they can be accepted.

A particular concern is at what rate the contractors should start recruiting labour. Experience show that this is often carried out at random when site supervisory staff is inexperienced. During this final planning stage, it is important to assist the contractors in a gradual build up of the work force according to the required sequential start up of work activities. Equally important is the proper site organisation during the initial stages. Due to the supervisory staff's lack of experience, it is recommended that a limited number of workers are recruited at first. The workforce should only be expanded to normal numbers once the initial work-force has been properly organised, i.e. thoroughly briefed in how to carry out the work and organised under an effective incentive scheme, preferably using task work.

8.4 Classification of Contractors

It is important that the trained road contractors are recognised and registered by the NCIC and certified to carry out a certain type of contracts. This will enable the government to streamline its activities in this sector and provide a uniformity to all projects wishing to use this approach to rural road rehabilitation and maintenance. Furthermore, it will secure the contracting firms future market prospects and thereby maintaining this capacity in the private sector of Malawi.

This project is limited to the introduction of domestic contractors to maintain and rehabilitate the district roads in Dedza and Lilongwe Districts. In order for this initiative to gain the desired degree of sustainability, it is important that the responsible government authorities formulates a clear policy relating to the future role of these contractors in the road sector of Malawi. The success of road maintenance by contract depends on regular allocation of budgetary resources and on the Government commitment to award the works to private contractors. Continuity of demand for works is a major condition for the contracting industry to develop.

TERMS OF REFERENCE
Short Term Consultancy

Developing Labour Based Small Scale Contracting

Consultant :	Bjørn Johannessen
Project/Title :	Central Region Infrastructure Maintenance Programme
Location :	Lilongwe, Malawi

1 Summary

CARE International in Malawi has received funding from the Department For International Development (DFID) for the Central Region Infrastructure Maintenance Programme to be implemented in Lilongwe and Dedza Districts. The goal of the project is increased long term economic growth and improved household livelihood security. Its purpose is to develop systems for sustainable and cost effective rural feeder road maintenance that directly contribute to improved household livelihood security in selected Traditional Authorities (TAs) in two districts of the Central Region of Malawi.

The project aims to pilot the following two models:

Employment of women in road maintenance through Contract Associations: Women will be organised into groups, termed Contract Associations, which will be contracted out by their respective Traditional Authorities to maintain rural feeder roads. During the course of their employment the women will receive appropriate training aimed at building their confidence and providing them with skills in basic business management, financial management, savings and credit management. Part of their payment will be retained in savings accounts. After graduation from road employment, their savings will be accessible, enabling them to utilise the money for expansion or development of economic activities.

The establishment of indigenous small scale community contractors: Small scale contractors will be identified and given training in contract management, tendering, pricing and technical aspects of road maintenance. By creating a network of contractors at community level, the programme would like to contribute towards the development of sustainable, cost-effective and efficient systems for rural road maintenance. CARE will work with the National Roads Authority and District Assemblies to identify and mobilise potential contractors. Training for the contractors will be conducted in conjunction with the National Construction Industry Council (NCIC) and Ministry Of Works training staff. After the training, the contractors will be offered contracts by the project on a competitive basis. During this time they will also be encouraged to bid for contracts funded by the District Development Fund (DDF), Malawi Social Action Fund (MASAF) and National Roads Authority (NRA).

2 Consultancy Overview

The aim of establishing a network of viable SSCC is to develop a sustainable system for rural road maintenance that is both cost effective and efficient. In the past the force account model has been the general model adopted by most local authorities in Malawi, whereby, as a public agency, it carries out all aspects of construction, supervision, management, as well as the control of all equipment, materials, and labour.

The establishment of a cadre of independently operating SSCC, contracted by the district road authority to maintain and rehabilitate rural feeder roads, is one means of contributing to the implementation of the reforms currently taking place in the road sector today. An approach that focuses on the development, and use of, SSCC aims to strengthen the capacity of the district road authority in its new role as contract manager, with responsibilities for the tendering, supervision and certification of roadworks. The end result is a district road authority that is able to devote more energy to the quality of road maintenance and rehabilitation with greater overall output.

Working closely with the National Road Authority, Ministry Of Local Government, the District Road Authority and NCIC, CARE will assist with the identification, training and mobilisation of an initial eight potential SSCCs. These SSCCs will be trained alongside district level supervisory staff in labour intensive rural feeder road maintenance and rehabilitation skills. Those SSCC who successfully pass the training will be awarded their first contract, in the form of a trial contract. This will provide an opportunity for the SSCCs and the district level supervisory staff to work closely, with additional training back up as and where required. The trial contract will normally be implemented on one road, with SSCC working on given stretches. This will allow the SSCC to be supervised closely during the period of the trial contract and for district level staff to become more familiar with their new role. Following the successful completion of the trial contracts, SSCC will be awarded additional contracts on a more or less competitive tendering basis.

The road sector in Malawi is presently undergoing significant reform. The National Roads Authority was established in October 1998 and is similar in nature to other Roads Authorities that are now operating in neighbouring countries (e.g. Zambia). As part of the present reforms, the National Construction Industry Council (NCIC) has been given the responsibility of looking after the interests of contractors and ensuring the quality of works. NCIC is presently supported by fees paid by contractors who register with the Council. Currently, the Council is using Ministry Of Works trainers to train local contractors. The present limitation in using these trainers is their lack up to date training skills and appropriate training curriculum, hindering their ability to develop the capacity of local contractors in response to the changing needs of the sector. The project aims to support the development of appropriate training curriculum for local contractors that focuses on appropriate contract management for contract managers, contract supervision for supervisors, maintenance and rehabilitation for SSCCs, and contract and business management for SSCCs.

Rather than training SSCCs directly, the projects preferred approach is to train the Ministries trainers with a view to developing their capacity and ability to conduct the necessary training for the SSCC that will have been selected through the project. This will provide an opportunity for the Ministry Of Works trainers to improve their own capacity as trainers, as well as enabling them to continue providing the same services to additional contractors outside the scope of the CARE's project at a later date.

3 Objectives of Consultancy

The overall objective of this consultancy is to provide appropriate curriculum development, training and contract documentation development which will enable labour based SSCC to implement road maintenance and rehabilitation contracts.

Specifically the objectives of this consultancy input are as follows:

1. To develop appropriate curriculum and materials that meet the following training requirements:

Categories	Training Requirements
Contract Managers/Supervisors (i.e. District Roads Engineers, Roads Supervisors, etc.)	<ul style="list-style-type: none"> • To be capable of carrying out all overall planning, control and monitoring activities. • To ensure efficient management support. • To be capable of issuing and supervising labour-based contracts.
Small Scale Community Contractors (SSCCs)	<ul style="list-style-type: none"> • To be capable of organising and carrying out labour based maintenance and rehabilitation work. • To be capable of organising and carrying out labour based maintenance and rehabilitation work. • To be capable of managing successfully contracts and the company's business, and the ability to organise and control all required assets. • To know how to acquire labour based road work contracts including all tendering and pricing procedures.

2. To develop appropriate contract documentation that is appropriate for the scale of works being envisaged for SSCCs.
3. To conduct a trainers of trainers training for selected Ministry Of Works trainers, MASAF staff, CARE Malawi staff and district level supervisory staff on the application and training of SSCCs based around the training curriculum developed above.

4 Specific Activities

The consultancy would undertake the following activities (this list is by no means exhaustive and is merely intended to provide guidance):

- Review all relevant project documents.
- Review any existing training materials both from Malawi and other countries.
- Review the present approach taken in Malawi towards the training of small scale contractors.
- Meet with appropriate road sector partners (e.g. NRA, NCIC, Ministry Of Works, MRTTP, MASAF, District Assemblies, etc.)
- Develop appropriate training modules to suit the needs of labour based small scale community contracting. This would cater for the needs of contract managers/supervisors and SSCCs, covering different aspects of contract management, contract supervision, maintenance and rehabilitation works, business management, etc.
- Develop appropriate contract documentation for the engagement of SSCCs.
- Assess the capacity of the Ministry Of Work's trainers to deliver appropriate training for the SSCCs.
- Conduct training of trainers course for selected Ministry Of Works trainers, CARE Malawi staff, MASAF staff, and district level supervisory staff in order for them to train SSCCs in the future.
- Recommend a strategy for the application of the training curriculum in terms of its long term use and adoption by the relevant authorities.
- Recommendations for future follow up and support to the training programme that should be provided by CARE and other local and external agencies.

Note : Reference is also made to the activities outlined in the Consultants Technical Proposal submitted on 10 February 2000.

5 Input from CARE

- Transport
- Arranging meetings
- Provision of secondary information
- Provision of stationery, tools and equipment.
- Support staff

6 Expected Outputs

- Training curriculum covering all aspects of SSCC training.
- Contract documentation that will be used to engage SSCCs.
- Training report on the training of Ministry Of Works staff, CARE Malawi staff, MASAF staff and district level supervisory staff.
- Presentation at the end of the consultancy assignment to project partners. The presentation would update project partners and provide information on the progress made during the consultancy.

7 Contract Duration and Timing

A total of fifty six (56) working days (48 working days in Malawi, 2 working days preparation and 6 working days final report writing). The Consultant is expected to arrive in Malawi on 13 March 2000.

Reporting will be as outlined above and as stated in the Consultants Technical Proposal.

**Technical Proposal
for
Developing Labour-based Small-scale Contracting
Dedza and Lilongwe Districts, Malawi**

1 Introduction

This proposal has been prepared in response to an invitation, dated 29 January 2000 from Mr. Nick Osborne, Country Representative of Care Malawi. The proposal is for developing labour-based small-scale contracting for the execution of rural feeder road maintenance and rehabilitation works in Lilongwe and Dedza Districts as described in the Scope of Works prepared by Care Malawi.

Based on the previous correspondence and the consultant's past experience in the rural road sector of Malawi, the following strategy is envisaged. Please note that the details of this approach to the assignment is a tentative one and may change in the process of carrying out the services, based on (i) the specific requirements of the various collaborating agencies to this programme, and (ii) the findings of the consultant during the course of the assignment.

2 Objectives of the Consultancy

The main objectives of this consultancy is to:

- establish a purpose oriented training programme which will ensure that local contractors possess the necessary capacity to execute road works contracts,
- introduce appropriate contract documents and procedures adapted to the specific requirements of this programme, and
- provide training of trainers in technical, managerial and administrative subjects related to the above activities.

3 Approach

There are two major physical outputs of this programme. One is to establish a functional road maintenance system, based on petty contractors recruited from the villages in the vicinity of the feeder roads. The second is to develop small-scale contractors in order to carry out road rehabilitation works.

Engaging petty contractors has proven to be a very effective way of addressing the demands for routine maintenance works on feeder roads. It is fairly easy to establish in terms of training and management development, and requires less supervision than the classic lengthman approach. However, before such a system is put in place, it is important that the road network is in a maintainable condition, thereby limiting the work of the petty contractors to routine maintenance activities and not also expecting that these small organisations also cater for rehabilitation works.

For this reason, it is important that other potential players, such as small-scale contractors, can provide the more complex works such as road rehabilitation, spot improvements and periodic maintenance, which require more skilled personnel, equipment, materials and sophisticated management.

Based on the activities defined in the Scope of Works, the approach to this assignment can be grouped into four distinct stages:

(i) Review of Current Situation

The immediate task upon commencement of the assignment will be to establish at which stage the programme has arrived in terms of planning and preparation. This involves reviewing relevant project documents, existing technical manuals and training materials, meeting with collaborating agencies, as well as obtaining detailed knowledge of the physical works envisaged. Since the project area is limited to only two Districts situated in close vicinity to the capital, it should be possible to quickly establish the current condition of the road network and the exact nature and extent of improvement and maintenance requirements.

The findings of the field surveys may have important implications in regards to the type and volume of works expected to be carried out by the contractors, which in the next turn prescribe the size of work force, duration of contracts, demand for tools and construction equipment.

An important component of this first stage will also be to review prevailing government contracting regulations and establish to what extent these procedures are applicable to road works carried out using labour-based technology and local contractors.

(ii) Prepare a Model for Implementation

Based on the findings of the review stage, a detailed model for implementation can be established and agreed to by all collaborating agencies. This includes the technical standards applied, methods of identification and selection of contractors, principles for contract award and supervision, measurement and payment of works, etc. As part of this exercise, the specific roles and responsibilities of the various collaborating agencies needs to be clearly defined, including detailed formulation of the human resource requirements both among the contracting firms, the client and the supervising agency (the Engineer).

Once full agreement has been obtained on the detailed modalities of implementation, the proposed system needs to be properly documented. This documentation, in the form of a management manual, will then serve as part of the basis for the ensuing training programme.

(iii) Produce Training Curriculum and Training Materials

Before starting out on the development of the training programme, it is important to carry out an assessment of the capacity of the various institutions which will be involved in implementing the works according to the system established during the previous stage. This includes the available staff of the potential contractors as well as the authorities which will be responsible for contracts management and supervision. Once the individual training needs of each category of staff have been established, it is possible to define the training programme and their curricula.

The next step will then be to explore to what extent already existing training courses and literature suit the requirements of this specific programme. It is important that the training programme is designed to be purpose oriented and addresses the specific tasks and responsibilities of each cadre of staff envisaged to take part in the programme.

Finally, the gaps where training literature is not available needs to be filled by producing new materials or by utilising existing literature from similar programmes in other countries.

(iv) Training

Training of trainers will need to cover three main topics:

- subject learning
- organisation and preparation of training programmes for the various cadres of staff, i.e. appropriate training methods, logistics, arrangements for field exercises, etc., and
- how components of the training programme can be sub-contracted to other institutions (i.e. accounting, business management, etc.)

Since the purpose of this training mainly consists of acquiring specific skills, enabling the various categories of staff to carry out their individual job duties, it is crucial that the trainers possess a solid knowledge of the subjects. To address this it will therefore be necessary to utilise various methods of training from class-room training, field exercises, group work, simulations, role plays, etc.

Finally, the trainers also need to be prepared for follow-up training once the first trial contracts have been awarded. This will involve briefings on how to effectively detect common mistakes, their remedies and the type of training which may eliminate repetitions of faulty work.

4 Outputs of Assignment

As a result of the above activities, the following specific outputs which will be achieved during the course of the assignment.

(i) Contracts Management System

The contracts management system will be clearly defined covering all the activities from contract preparation, award, supervision, measurement and payments. This needs to be combined with clear definitions of the organisational setup, who are the various partners to a contract and in which authorities the various responsibilities have been vested.

It is advisable to split this output into two systems, one defining the road maintenance setup, which requires a more simplified system to deal with the petty contractors, and secondly the contracts management system for the rehabilitation works which should adhere to common standards and practices within the field of contracting.

Finally, it is expected that the above mentioned system will not only cater for the specific needs in this individual project, but can also act as a model for expansion into other districts in the country.

(ii) Technical Issues

There is already a long practice of using labour-based road works technology in Malawi, however, this may be a good opportunity to review current and past practice and possibly further develop the applied work methods. Any changes to current practice should be thoroughly documented to ensure that the new technology is eventually used.

Secondly, the use of labour-based methods needs to be clearly reflected in the contract documents. This implies that new works specifications needs to be developed in line with the established work methods and standards used for feeder road rehabilitation and maintenance.

(iii) Training Programme

Based on the above outputs and training needs assessments, appropriate training programmes for the various categories of staff as identified in the SoW will be developed. This will include training programmes, curricula, training materials, instructions to trainers, identification of

appropriate reference literature and recommendations on collaboration with other in-country training institutions.

(iv) Improved Training Capacity

In addition to developing the training programmes, it is important that the trainers know how to use the materials, how the training is conducted in the most efficient way, and that they possess the necessary skills to act as a resource base for the staff which will be responsible for implementing the road works. For this reason, a training of trainers course will be arranged at the end of the assignment in order to improve the trainers knowledge of the subjects as well as improving their pedagogic skills.

(v) Recommendations for Further Action

This assignment is only part of the preparatory stage of this programme. There are still a number of issues which needs to be addressed before full scale staff training commence as well as awarding the first trial contracts.

On the basis of the developments during the course of this assignment, it will be possible to draw up a plan of action for the remaining project activities. These recommendations will be summarised in a mission report, including a tentative work plan. As part of these recommendations, any demand for further external assistance will also be addressed.

5 Mission Programme

The following table describes an outline of the mission programme with some tentative dates and milestones:

Week	Activities	Milestone
0	Preparation of mission, reviewing reference literature at home office, and travel from Phuket to Lilongwe.	12 March
1	Review of current situation, meetings with key personnel in collaborating agencies, field visits to any ongoing works, road condition surveys, meetings with potential contractors, review project related documents, literature studies, etc.	
2	Review technical literature, technical standards, existing manuals, prevailing contracts documents and current management system for feeder roads works.	
2	Present initial findings, prepare an outline of the proposed mode of implementation and a revised schedule of work for the remaining part of the assignment.	27 March
3-4	Develop contract management system for (i) routine maintenance and (ii) feeder road rehabilitation works.	
4	Present the contract management system to key management staff in the collaborating agencies and submission of draft contract management manuals.	7 April
5-6	Develop course curricula, training programmes and training materials.	
7-8	Conduct Training of Trainers Course	24 Apr-5 May
8	Present achievements of assignment and recommendations for future action.	5 May
9	Return to Thailand.	6 May
10	Final editing of documents, preparation of mission report and submission of documents to Care Malawi.	19 May

Mission Itinerary, 13 March - 7 May 2000

Annex 2

Week No.	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
1	13. Arrival Lilongwe and briefing by CARE Country Representative and Project Manager.	14. Meeting with CARE Technical Coordinators and review of reports.	15. Participate in community meeting in Chitikula TA, Lilongwe District.	16. Meeting with Calcon Consulting Engineers and MoWS Training Section.	17. Meetings with NCIC and NRA.	18. Report reading and writing.	19. Report reading and writing.	
2	20. Report reading and writing.	21. Meeting with MRTTP.	22. Report reading and writing.	23. Meetings with MASAF headquarters and Zone Office.	24. Review of findings with CARE staff.	25. Report reading and writing.	26. Prepare presentation of initial findings.	
3	27. Present initial findings, and proposed mode of implementation.	28. Meeting with local World Bank office.	29. Preparation of maintenance management system.	30. Preparation of maintenance management system.	31. Meeting with Local Government.	1. Preparation of maintenance management system.	2.	
4	3. Finalising proposed maintenance management system.	4. Submit draft maintenance management system.	5. Field visit to roads identified by beneficiaries in Dedza District.	6. Prepare contract management system for road rehabilitation.	7. Meeting with ILO ASIST mission.	8. Prepare contract management system for road rehabilitation.	9. Prepare contract management system for road rehabilitation.	
5	10. Field visit to MASAF road works site in Lilongwe District.	11. Submit draft contract documents for road rehabilitation works.	12. Submit draft contract management system for road rehabilitation works.	13. Present contract management system for key players.	14. Meeting with MoTPW Training Centre.	15. Prepare course curricula and programmes.	16. Prepare course curricula and programmes.	
6	17. Prepare for Training of Trainers Workshop.	18. Prepare training brief for CARE.	19. Prepare for Training of Trainers Workshop.	20. Meeting with CARE project staff regarding training programme.	21. Prepare for Training of Trainers Workshop.	22. Prepare for Training of Trainers Workshop.	23. Prepare for Training of Trainers Workshop.	
7	24. Start Training of Trainers Workshop	25 - 30. Training of Trainers Workshop					29. Prepare for Training of Trainers Workshop.	30. Prepare for ToT Workshop.
8	1 - 5. Training of Trainers Workshop continued				5. Round up meeting.	6. Departure Lilongwe to Thailand	7. Arrival Thailand	

CARE Malawi

Mr. Nick Osborne, Country Representative
Ms. Mercy Shano, Project Manager (CRIMP)
Mr. Lemekeza Mokiwa, Technical Coordinator Lilongwe District
Mr. Yikherdhn Kalua, Technical Coordinator Dedza District

National Roads Authority

Mr. Adrian Mtini, Project Engineer

Ministry of Transport and Public Works

Mr. C. Chilunga, Principal Training Officer
Mr. Lameck George Linachi, Roads Instructor, Works Training Centre
Mr. Alexander N.D. Nyirongo, Technical Instructor (Roads)
Mr. Chataika, District Road Supervisor, Lilongwe District
Mr. Nyoni, District Road Supervisor, Dedza District

Ministry of Local Government

Mr. R. R. Nyirongo, Local Governance and Decentralisation Programme

Malawi Social Action Fund

Ms. Ida Manjolo, Director of Public Works
Mr. Robin Chikaya, Public Works Programme
Mr. George Manda, Zone Manager

Malawi Rural Travel and Transport Programme

Mr. Alfred Chibwana, Project Manager
Mr. George Mwase, Programme Officer

National Construction Industry Council

Mr. Austin Mkandawire, Executive Secretary

District Assemblies

Mr. Roberts Tauka, Chief Executive Officer, Dedza
Mr. G.T. Macheke, Director of Finance, Dedza

Donor Agencies

Mr. Moffat Chitembe, Infrastructure Programme Officer, World Bank
Mr. Kenton Kayira, National Programme Officer, World Food Programme

Others

Mr. Stuart Miller, Calcon

General

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Course Programme, Training of Trainers Workshop

Course Participants, Training of Trainers Workshop

Course Modules Contractor Training Programme

Road Rehabilitation Works

Road Condition Surveys and Estimating Road Rehabilitation Works

Routine Maintenance Management

Contracts Management for Road Rehabilitation Works

Course Programme for Rural Road Maintenance Management

Training of Trainers Workshop, 24 April - 5 May 2000

Time	Monday 24.4	Tuesday 25.4	Wednesday 26.4	Thursday 27.4	Friday 28.4
9:00	Official Opening Course Introduction Introduction to Participants and Trainers Practical Arrangements	Review of Drainage System: Side drains, road camber, mitre drains, catchwater drains, scour checks, siting of cross-water structures, structures.	Practical Surveying and Setting Out Presentation of Programme Organisation of Teams	Planning of Road Rehabilitation Works Road condition inventories and estimating	Routine Maintenance The Malawi road sector Purpose of maintenance Types of Maintenance Financial priorities
9:40					
9:50	Presentation of Course Programme and course materials Course Conduct	Rehabilitation of Drainage Structures	Field Session	Practical exercise	Routine Maintenance Approach and technology choice Maintenance organisations
10:30					
T E A B R E A K					
10:40	Defining the performance requirements of the small-scale contractor engaged on rural road rehabilitation works	Surveying and Setting Out Methods: Longitudinal and vertical alignments, drainage and road camber, setting out tasks, final levelling works.	Field Session	Practical Exercise	Road Maintenance Planning Inventories, assessment of requirements, timing and planning of works.
11:20					
11:30	Review of Basic Arithmetic and Calculation of Quantities.	Design of Training Programme in Labour-based rural road works technology for small scale contractors			Maintenance Management Maintenance organisation and staff duties and responsibilities
12:10					
L U N C H					
14:00	Review of Site Organisation: Setting up a camp, Appropriate hand tools and their safekeeping and maintenance, Recruitment of workers.	Design of Training Programme continued	Field Session	Exercise continued	Review of Maintenance Activities
14:40					
14:50	Review of Work Organisation Gang-balancing, incentive schemes, task and productivity rates, setting of tasks.	Appropriate training materials for road rehabilitation works		Presentation of Results	Design of Training Programme for Maintenance Inspectors
15:30					
T E A B R E A K					
15:40	Review of Design Standards and Construction Methods. Cut to fill, drains, side slopes, embankments, erosion control.	Appropriate training materials continued	Comments to field sessions	Presentation of Results continued	Design of Training Programme continued
16:30					

Time	Monday 1.5	Tuesday 2.5	Wednesday 3.5	Thursday 4.5	Friday 5.5
9:00	Contracts Management for Routine Maintenance Definition of the Client and the Contracts Administrator	Contracts Procedures for Rehabilitation Works: Overview of process, management structure, tendering and evaluation process.	Productivity Rates and Unit Rates for Road Rehabilitation Works for Standard Work Activities	Practical Exercise on Tendering, continued	Reporting and Monitoring
9:40					
9:50	Duties of the Maintenance Inspector	Preparing the Engineers Estimate	Unit Rates continued		Reporting and Monitoring
10:30					
T E A B R E A K					
10:40	Preparation of Maintenance Contracts: Workplan, appropriate size of petty contracts	Preparation of Tender Documents Instructions to Bidders Prequalification	Unit Rates continued	Presentation of group work	Design of Training Programme: Class-room training Field exercises Field training on Demonstration Site
11:20					
11:30	Instruction and on-the-job training of the petty contractors	General Conditions of Contract	Contracts Procedures for Rehabilitation Works: Evaluation of Tenders	Payment and Measurement	Closing Ceremony
12:10					
L U N C H					
14:00	Measurement and Payment of petty contractors. Accounting and funds transfers.	Special Conditions of Contract	Practical Exercise on Estimating	Practical Completion and Defects Liability Period	
14:40					
14:50	Reporting and monitoring of routine maintenance works	Works Specifications: Preamble Pay Items Contingencies, supervision and profit	Practical Exercise	Contract Register Payment Procedures Funds Management Accounting, the Role of the Bank	
15:30					
T E A B R E A K					
15:40	Preparation of Course Programme in Contracts Management for Maintenance Inspectors	Bidding Procedures: Submitting a tender Receiving tenders Tender opening	Practical Exercise	Preparation of Course Programme in Contracts Management for Rehabilitation Works	
16:30					

List of Participants

Training of Trainers Workshop

Name	Designation	Organisation
C.F. Chilunga	Senior Training Officer	Works Training Centre
L.G. Linachi	Technical Instructor Roads	Works Training Centre
A. Nyirongo	Technical Instructor Roads	Works Training Centre
R.F. Tauka	Chief Executive Officer	Dedza District Assembly
G.T. Macheka	Director of Finance	Dedza District Assembly
M.C. Nyoni	Senior District Roads Supervisor	Dedza District Assembly
A.K. Moyo	Chief Executive Officer	Lilongwe District Assembly
A.G. Kalumbi	Director of Finance	Lilongwe District Assembly
J.A. Chataika	Road Supervisor	Lilongwe District Assembly
G.K. Mwase	Programme Officer	MRTTP
S.L. Gwedemula	Programme Officer	MRTTP
A.E. Mkandawire	Executive Secretary	NCIC
Robert Mapemba	Technical Field Adviser	CARE
Sungani Tembo	Technical Field Adviser	CARE
Nicholas M.I. Yobe	Technical Field Adviser	CARE
Yikherdhn Kalua	Technical Coordinator	CARE
L.H. Mokiwa	Technical Coordinator	CARE

Course Modules for Contractor Training Programme

Rural Road Rehabilitation Works							
Subject:	Basic Arithmetic and Calculation of Quantities						
Course Objectives:	<ul style="list-style-type: none"> • Effectively calculate quantities and volumes of work • Determine exact levels of road works 						
Keywords:	Basic Arithmetic: addition, subtraction, multiplication, division Calculating areas of triangles, squares, rectangles, trapeziums, circles Calculating slopes and gradients						
Target Audience:	<ul style="list-style-type: none"> • Road rehabilitation contractors • Overseers • Maintenance Inspectors • District Road Supervisors • Project Engineers 						
Training Materials:	Hand-outs prepared by the Training Centre						
Duration:	<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Class-room training:</td> <td style="text-align: right;">16 hours</td> </tr> <tr> <td>Field Demonstrations:</td> <td style="text-align: right;">4 hours</td> </tr> <tr> <td>Field Training:</td> <td style="text-align: right;">-</td> </tr> </table>	Class-room training:	16 hours	Field Demonstrations:	4 hours	Field Training:	-
Class-room training:	16 hours						
Field Demonstrations:	4 hours						
Field Training:	-						

Rural Road Rehabilitation Works	
Subject:	Site Organisation
Course Objectives:	<ul style="list-style-type: none"> • Able to organise and site a camp, • Able to identify suitable tools, maintain tools and safe-keep tools, • Able to recruit casual labour.
Keywords:	<p>Location of camp, walking distance to site, negotiations with land owners, camp facilities, storeroom for tools, vehicular access, good source of water Type and number of hand tools, the role of the store keeper, distribution of tools to the workers, safe keeping, daily stock keeping, maintenance of tools, repairman for sharpening tools, and replacement of handles Recruitment of workers, advance notice, gradual recruitment according to work programme, conditions of employment, mode of payment, productivity rates, gender issues</p>
Target Audience:	<ul style="list-style-type: none"> • Road rehabilitation contractors, • Overseers • Maintenance Inspectors • District Road Supervisors • Project Engineers
Training Materials:	DRIMP technical manual and DRIMP training material
Duration:	
Class-room training:	3 hours
Field Demonstrations:	-
Field Training:	1 day

Rural Road Rehabilitation Works	
Subject:	Work Organisation
Course Objectives:	<ul style="list-style-type: none"> ● Able to effectively organise the labour force, allocating workers appropriately to the various operations and activities; ● Assess appropriate levels of task rates.
Keywords:	<p>Sequencing of work activities: supporting activities, camp work, water fetching, setting out, stores, site clearing, bush clearing, stump removal, boulder removal, grubbing, excavation and filling, spreading and compaction of fills, excavation of side mitre and catchwater drains, sloping, camber formation, scour checks, culvert repairs.</p> <p>Gradual recruitment of workers as and when each activity commence, gang balancing and sequencing of works, incentive schemes, motivation of workers, payment modes, daily, piece and task work, setting appropriate tasks, factors affecting level of task rates</p>
Target Audience:	<ul style="list-style-type: none"> ● Road rehabilitation contractors ● Overseers ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers
Training Materials:	DRIMP Technical Manual and DRIMP Training Materials
Duration:	
Class-room training:	6 hours
Field Demonstrations:	-
Field Training:	3 weeks

Rural Road Rehabilitation Works							
Subject:	Design Standards and Construction Methods						
Course Objectives:	<ul style="list-style-type: none"> ● Able to design the various elements of the road structure and use effective construction methods 						
Keywords:	<p>Design speed, types of cross section designs, setting out works, sequence of excavation works, throwing pegs, shoulder and ditch pegs, excavate ditches and placing material at the centre of the road, controlling works with templates and string lines, controlling camber slopes</p> <p>Erosion Control: scour checks, mitre drains, catchwater drains, lining of drains, check dams, widening of the drain, grass-planting, wattling, gabions, turfing</p> <p>Stabilising back slopes, reducing angle of back slope, surcharging the face, retaining walls</p>						
Target Audience:	<ul style="list-style-type: none"> ● Road rehabilitation contractors ● Overseers ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers 						
Training Materials:	DRIMP Technical Manual and Training Materials, Technical Manual, Minor Roads Programme Kenya, International Road Maintenance Handbooks.						
Duration:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="padding: 2px;">Class-room training:</td> <td style="text-align: right; padding: 2px;">16 hours</td> </tr> <tr> <td style="padding: 2px;">Field Demonstrations:</td> <td style="text-align: right; padding: 2px;">2 days</td> </tr> <tr> <td style="padding: 2px;">Field Training:</td> <td style="text-align: right; padding: 2px;">2 weeks</td> </tr> </tbody> </table>	Class-room training:	16 hours	Field Demonstrations:	2 days	Field Training:	2 weeks
Class-room training:	16 hours						
Field Demonstrations:	2 days						
Field Training:	2 weeks						

Rural Road Rehabilitation Works							
Subject:	the Road Drainage System						
Course Objectives:	Establish an understanding of the purpose of the various elements of a road drainage system						
Keywords:	<p>Purpose of drainage, elements and function of drainage on the road: camber, ditches scour checks, mitre drains, catchwater drains, culverts, drifts, Irish bridges, bridges, splashes</p> <p>Placing and constructing catchwater drains, mitre drains and scour checks</p> <p>Pre-design surveys for cross-water drainage, siting of cross-drainage</p> <p>Timing of drainage works</p>						
Target Audience:	<ul style="list-style-type: none"> ● Road rehabilitation contractors ● Overseers ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers 						
Training Materials:	DRIMP Technical Manual and DRIMP Training Materials						
Duration:	<table style="width: 100%; border: none;"> <tr> <td style="padding: 2px;">Class-room training:</td> <td style="text-align: right; padding: 2px;">20 hours</td> </tr> <tr> <td style="padding: 2px;">Field Demonstrations:</td> <td style="text-align: right; padding: 2px;">-</td> </tr> <tr> <td style="padding: 2px;">Field Training:</td> <td style="text-align: right; padding: 2px;">1 week</td> </tr> </table>	Class-room training:	20 hours	Field Demonstrations:	-	Field Training:	1 week
Class-room training:	20 hours						
Field Demonstrations:	-						
Field Training:	1 week						

Rural Road Rehabilitation Works							
Subject:	Surveying and Setting Out						
Course Objectives:	To master setting out of horizontal and vertical alignments, road cross sections and the other components of the road structure						
Keywords:	<p>Purpose of setting out, appropriate tools and their functions, pegs, hammers, ranging rods, measuring tapes, string lines, markers, pangas, axe, paint, line level, builders square, drawings, boning rods, camber boards</p> <p>Setting out the centre line, straight lines, curves, off-set and tangent methods, side drains, slope and camber, reference marks, using string line to define tasks and levels of work</p> <p>Organisation of setting out team, timing of setting out, task rates</p>						
Target Audience:	<ul style="list-style-type: none"> ● Road rehabilitation contractors ● Overseers ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers 						
Training Materials:	DRIMP Technical Manual and DRIMP Training Materials						
Duration:	<table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">Class-room training:</td> <td style="text-align: right;">4 hours</td> </tr> <tr> <td>Field Demonstrations:</td> <td style="text-align: right;">3 days</td> </tr> <tr> <td>Field Training:</td> <td style="text-align: right;">2 weeks</td> </tr> </table>	Class-room training:	4 hours	Field Demonstrations:	3 days	Field Training:	2 weeks
Class-room training:	4 hours						
Field Demonstrations:	3 days						
Field Training:	2 weeks						

Rural Road Rehabilitation Works	
Subject:	Reporting and Monitoring
Course Objectives:	<ul style="list-style-type: none"> ● Able to prepare daily work programmes ● Able to report labour inputs, physical work progress and production rates
Keywords:	Daily work programming, gangleader's report, planned and actual inputs and outputs, weekly roadworks output, monthly labour input, muster roll, stores control, District progress report
Target Audience:	<ul style="list-style-type: none"> ● Road rehabilitation contractors ● Overseers ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers
Training Materials:	DRIMP Technical Manual and DRIMP Training Materials
Duration:	
Class-room training:	8 hours
Field Demonstrations:	-
Field Training:	-

Rural Road Rehabilitation Works

Subject:

Road Condition Surveys and Estimating Rehabilitation Works

Course Objectives:

- Able to effectively assess rehabilitation requirements, estimate labour, tools and material inputs, and cost the works;
- Present work plans using bar charts and time-location charts;

Keywords:

Surveying road condition,
 Use of road condition inventory forms,
 Key indicators of deterioration,
 Planning and scheduling of works, key factors which influence work plans
 Calculating quantities of work
 Definition of task rates and productivity rates, wage rates, costing of tools,
 supervision costs, provision for profits
 Bar charts, time-location charts, measuring progress

Target Audience:

- Road rehabilitation contractors
- Overseers
- Maintenance Inspectors
- District Road Supervisors
- Project Engineers

Training Materials:

DRIMP literature, Contracts Management Manual for Rural Road Rehabilitation and hand-outs prepared by the consultant (sample bar charts, time-location diagrams and road condition inventory form)

Duration:

Class-room training:	2 + 2 days
Field Demonstrations:	1 day
Field Training:	-

Rural Road Rehabilitation Works

Subject:

Contracts Management for Rehabilitation Works

Course Objectives:

- able to effectively organise and manage tenders, issue contracts, supervise and certify works and arrange for payments for road rehabilitation works using labour-based work methods,
- estimate and submit tenders, negotiate contracts, plan and execute works according to contract agreements and submit invoices for completed works,
- fully understand contents of contract documents

Keywords:

Costing principles, unit rates, mobilisation, pay items, supervision, profits, contingencies, procedures for tendering, evaluation and award of contract, pre-qualification, procedures for measurement, certification and payment, giving instructions, work programming, contract variations, retention monies defects liability period, employment conditions, cash flow management, planning and reporting progress,

Contract documents: Notice for Invitation, Instructions to Tenderers, Form of Tender, Form of Agreement, General Conditions of Contract, Appendix to Conditions of Contract, Special Conditions of Contract, List of Basic Labour Rates, Works Specifications, Technical Drawings, Bill of Quantities, Road Condition Inventory, Notification of Award, Payment Breakdown, Interim Payment Certificate, Certificate of Practical Completion, Final Certificate of Completion

Target Audience:

- Road rehabilitation contractors
- Overseers
- District Road Supervisors
- Project Engineers

Training Materials:

Contracts Management Manual for Labour-based Road Rehabilitation Works

Duration:

Class-room training:

Field Demonstrations:

Field Training:

Rural Road Maintenance Management							
Subject:	Rural Road Maintenance Management						
Course Objectives:	Able to effectively plan, organise and manage rural road routine maintenance carried out by local petty contractors using labour-based work methods.						
Keywords:	Road maintenance policy issues, purpose of maintenance, maintenance organisations, government policies, lengthman system, use of contractors, force account, technology choice, priorities, types of maintenance: routine, periodic and urgent maintenance, road condition surveys and inventories, defects indicators, main tasks of a maintenance organisation, maintenance activities, work methods, programming and work scheduling, optimum timing of maintenance activities, technical standards, task rates, budgeting, resource allocations tender procedures and award of contracts, contracts documents, appropriate size of petty contracts, contract management and supervision, measurement and payment of works, duties of the maintenance inspector, reporting and monitoring of works						
Target Audience:	<ul style="list-style-type: none"> ● Maintenance Inspectors ● District Road Supervisors ● Project Engineers 						
Training Materials:	Rural Road Maintenance Management Manual and International Road Maintenance Handbooks						
Duration:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="padding: 2px;">Class-room training:</td> <td style="text-align: right; padding: 2px;">7 days</td> </tr> <tr> <td style="padding: 2px;">Field Demonstrations:</td> <td style="text-align: right; padding: 2px;">-</td> </tr> <tr> <td style="padding: 2px;">Field Training:</td> <td style="text-align: right; padding: 2px;">4 days</td> </tr> </tbody> </table>	Class-room training:	7 days	Field Demonstrations:	-	Field Training:	4 days
Class-room training:	7 days						
Field Demonstrations:	-						
Field Training:	4 days						

Rural Road Rehabilitation Works							
Subject:	Business Management						
Course Objective:	<ul style="list-style-type: none"> ● able to run all administrative duties of the company, ● able to account for income, expenses and profits, ● able to deal with banks and insurance 						
Keywords:	<ul style="list-style-type: none"> ● registration of the company: commercial and professional licences ● contracting association(s) ● marketing ● dealing with banks ● insurance ● book keeping ● cash flow management ● calculating profits ● administration and correspondence ● taxes, government fees, etc. 						
Target Audience:	<ul style="list-style-type: none"> ● Small-scale Contractors ● Project Engineers 						
Training Materials:	Already existing literature developed for managing small-scale business enterprises.						
Duration:	<table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Class-room training:</td> <td style="text-align: right;">5 days</td> </tr> <tr> <td>Field Demonstrations:</td> <td style="text-align: right;">-</td> </tr> <tr> <td>Field Training:</td> <td style="text-align: right;">-</td> </tr> </table>	Class-room training:	5 days	Field Demonstrations:	-	Field Training:	-
Class-room training:	5 days						
Field Demonstrations:	-						
Field Training:	-						

Course Programme for Rural Road Maintenance Management

Week 1:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Course registration, introduction and presentation	Review of maintenance activities and work methods, continued	Planning and scheduling road maintenance	Practical field exercise in road maintenance condition surveying	Group work on maintenance planning based on maintenance field survey	Group work continued
Purpose and definition and types of maintenance, Financial priorities, government policies					
Maintenance strategy, approach and technology choice		Planning routine road maintenance			
Maintenance management organisations, staff duties and responsibilities	Maintenance indicators	Road condition surveys and inventories for maintenance			Presentation of group work
Review of maintenance activities					

Week 2:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Contract management for routine road maintenance	Preparation of petty contracts for routine maintenance	Practical exercise on preparing contracts for routine maintenance. Presentation of group work	Field trip to road under routine maintenance by petty contractors	Measurement and payment of works	Preparation of payment certificates
Task and production rates for routine maintenance				Measurement and payment of works - field exercise	Reporting and monitoring routine maintenance works

Note: The above training programme has been developed based on the assumption that the trainees have already completed a course in rural road works technology using labour-based technology, during which they have acquired adequate knowledge in setting out methods, work organisation, the road drainage system and other basic road works technology subjects.