This project was funded by the Africa Community Access Programme (AFCAP) which promotes safe and sustainable access to markets, healthcare, education, employment and social and political networks for rural communities in Africa.

Launched in June 2008 and managed by Crown Agents, the five year-long, UK government (DFID) funded project, supports research and knowledge sharing between participating countries to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources.

The programme is currently active in Ethiopia, Kenya, Ghana, Malawi, Mozambique, Tanzania, Zambia, South Africa, Democratic Republic of Congo and South Sudan and is developing relationships with a number of other countries and regional organisations across Africa.

This material has been funded by UKaid from the Department for International Development, however the views expressed do not necessarily reflect the department’s or the managing agent’s official policies.

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Report summary

AFCAP is providing TA assistance to the Infrastructure Development Unit in PMO-RALG of the Government of Tanzania, to achieve its objective of setting up a District Road Research Centre (DRRC) in Dodoma. This report gives details of the activities undertaken in a short extension to the project to provide assistance in promoting the initial procedures required in setting up the DRRC including provision of a materials laboratory, funding priority projects, establishing a Technical Committee and recruiting staff.
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<td>Development Partner</td>
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<td>District Road Research Centre</td>
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Abstract/

AFCAP is providing support to the District Road Research Centre (DRRC) Project in Tanzania and has received a request to purchase various laboratory and testing equipment from the Prime Minister’s Office Regional Administration and Local Government (PMO-RALG) Infrastructure Development Unit (IDU), Tanzania. This project is to assist PMO-RALG to achieve its objective of setting up a DRRC in Dodoma and to develop a strategic plan for implementation of its research priorities in accordance with the Draft National Transport Policy (2012). The initial phases of the project have been completed and the outcomes, conclusions and recommendations are contained in the Final Report.

The extension assignment is aimed at providing immediate further support to assist the DRRC initiate implementation actions to establish the Centre and its Laboratory and develop a plan of action for the next 6 months.
Executive Summary

A short extension to the main project (Ref: AFCAP/TAN 130) to establish a District Road Research Centre (DRRC) in PMO-RALG in Dodoma was commissioned under the African Community Access Programme (AFCAP) specifically to assist the head of the DRRC to initiate actions and prepare future activity plans. The main objectives were to assist the Head of Research develop short-term (six months) actions to establish the DRRC and its research activities; to renovate the building identified for the DRRC laboratory; to check and receive the laboratory equipment and to commission the materials testing laboratory.

An initial kick-off planning meeting was held at the PMO-RALG offices in Dar es Salaam. Consequently, discussions were held with the architect and quantity surveyor at the Dodoma Municipal Offices, where the DRRC laboratory will be located. The equipment consignment was checked and outline plans for the building agreed. A work plan for the future activities required for commissioning the laboratory was prepared and meetings held with the Central Materials Laboratory in Dar es Salaam and collaboration, advice and training support for the DRRC was confirmed.

The Team Leader attended the AFCAP Steering Committee meeting on Wednesday 4th June to present on the progress to establish the DRRC, the next steps and issues to be addressed. It was noted that it was intended that the Steering Committee would be reconstituted for AFCAP 2. It was agreed that it would also take on the responsibilities of the DRRC Technical Committee and would meet again in September. It was noted that several actions were needed to temporarily fill the gap between AFCAP 1 and AFCAP2, including securing short term TA.

Priorities for progressing the DRRC and its activities were agreed with the Director of PMO-RALG IDU on Friday 6th June. In addition to commissioning the Dodoma Laboratory in six months, these are to address Short- and Long-term TA support funding and also funding of the priority projects. Communication with DP’s is underway and meetings planned. Feedback on potential funding from the RFB and DP’s is encouraging.

1. Introduction

1.1 Background

AFCAP is providing support to the District Road Research Centre (DRRC) Project in Tanzania and has received a request to purchase various laboratory and testing equipment from the Prime Minister’s Office Regional Administration and Local Government (PMO-RALG) Infrastructure Development Unit (IDU), Tanzania. An assignment has been undertaken to assist PMO-RALG achieve its objective of setting up a DRRC in Dodoma and to develop a strategic plan for implementation of its research priorities in accordance with the Draft National Transport Policy (2012):

The main component of the project has been completed and the outcomes are given in the Final Report (AFCAP/TAN130, May 2014) for the project in which a study was undertaken to:

- Conduct a needs assessment study, based on the mandate of PMO-RALG in general, and the Infrastructure Development Unit (IDU) in particular, for the establishment of road research capacity in Tanzania. The study is carried out in-country and in consultation with the Road Fund Board (RFB), the Director of IDU and her team and with other stakeholders.
- Prepare a policy framework to guide future road research activities.
- Prepare a strategic plan for the identification and implementation of priority research activities under the ambit of PMO-RALG in the short, medium and long term.
- Sets out the next steps.
2. Purpose of this report

The purpose of this document is to report on the activities and progress by the TA Team during their 10-day visit in May/June 2014 and to record progress on the agreed short term (6 month) action plan in the Final Report.

2.1 This assignment

The overall objectives of this assignment are to assist PMO-RALG in preparing a plan to:

- Set up and operationalise the laboratory in Dodoma
- Develop a short term business plan for the PMO-RALG research centre, including quick-wins activities
- Establish the DRRC Steering Committee
- Set up a forward plan for funding priority projects with the Road Fund and Development partners.

Two team members have been contracted to undertake this assignment.

The Team Leader has been tasked with working with the Head of the Research Centre to prepare and assist with implementation actions for the next 6 month, which will include:

- Review outputs of the road trials monitoring programme for forward planning purposes. Use the information to inform production of an ‘early findings’ report for better road design options.
- Start library information and dissemination activities, including basic EDMS, website, information circulation.
- Commission scoping studies for setting up a material database/inventory for Tanzania.
- Commission a review for road asset management plans and DRRC’s role.
- Agree the composition of the Research Steering Committee and its first meeting.
- Establish a Sub-committee on funding of research and coordination of its first meeting.

Output: Detailed report on progressing plans on above activities.

The specific tasks for the International Transport Sub-Sector Specialist in this short-term assignment (addressed in this report) are to assist PMO-RALG with planning for the physical establishment of the materials testing laboratory including:

- Conversion of building identified for the laboratory.
- Preparation of plans for fit-out of benching, cupboards, furnishings, store, etc.
- Recruitment and training of laboratory manager and staff.
- Support by Central Materials Laboratory (CML) for the installation of laboratory equipment and training PMO-RALG technicians.
- Development of short, medium and long-term capacity building programmes.
- Establishment of Quality Assurance mechanisms and sample tracking software.
- Establish strong links with CML for operational support and continuous in-service training.

Output: Progress report on above activities, including short-term implementation plan for the establishment of the laboratory.
3. **PART A: Assistance with the planning and implementation of the DRRC Laboratory**

3.1 **Activities**

3.1.1 **General**

The Transport Sub-Sector specialist arrived in Dar es Salaam Wednesday 28 May. Initial contacts were made the following day and meetings held in Dar es Salaam for a plan of action for the visit.

The original plan as set out in the TOR was to spend most of the 10 day visit in Dodoma with Engineer Fikiri Magafu, who is the designated head of the DRRC. However, in the kick-off meeting in Dar es Salaam, Eng Magafu stated that he is required to attend meetings in Dar es Salaam on the Monday and Wednesday of the following week. Therefore it became clear that his time in Dodoma would be more limited than originally planned and restricted to Saturday and early Sunday morning only. It was agreed that any further meetings with Eng, Magafu would take place in Dar es Salaam after completion of the tasks by the transport specialist in Dodoma.

3.1.2 **Checking the laboratory equipment consignment**

Mr Abdul Mtola was assigned by CML to assist in the checking of the equipment and his long experience at CML was extremely valuable in assisting the checking procedures.

The assistance of staff from the Dodoma Municipal Offices and of PMO-RALG is also gratefully acknowledged.

The consignment of laboratory equipment arrived in Dodoma on Monday night the 2 June, some 4 days later than planned. The consignment was checked against the packing list and unpacked throughout Tuesday 3 June and found to be complete. It was unpacked at the municipal offices but transferred to the PMO-RALG stores for safe keeping.

Although the consignment was complete as per the order list, a number of additional items have been identified that will be essential for the DRRC laboratory to function effectively. It is recommended that these additional items (shown below) are procured as soon as possible.

These items are:

- Field density measurement apparatus
- 4Kg rammer
- Shrinkage moulds
- Aggregate Crushing Value or 10% FACT testing equipment, or
- Aggregate Impact Value

The field density equipment is essential for checking (QA) compliance with specified compaction limits on district roads and for ensuring that any trial sections are constructed according to the desired specifications.

The required levels of compaction for gravel wearing courses and the upper pavement layers of paved roads are normally set as a percentage of the standard compaction achieved in the laboratory using a 4Kg rammer. This is an essential piece of equipment in the preparation of materials for testing to this standard.

Some specifications refer to the shrinkage value rather than plasticity and this test requires the use of shrinkage moulds (troughs).

Aggregate strength is an important parameter governing the performance of both unpaved and sealed roads and a capability of measuring this parameter is very important in assessing the properties of aggregates used in all road construction projects.

3.1.3 **Recommendations/Plan**

It is recommended that funding is sought for the above equipment, either from a parallel DP funded project, or from AFCAP 2.
It is clear that assistance from CML will be required when the equipment is installed at the laboratory and that a person with Mr Mtola’s experience and knowledge of equipment, familiarity with the layout and of the local personnel, is ideally suited for this role.

3.2 Conversion of building to a laboratory

3.2.1 The building

An alternative building to the one originally chosen in November 2013 for the proposed DRRC materials testing laboratory has been identified by PMO-RALG at the premises of the Municipal Council offices in Dodoma. A preliminary visit to the site was made on Saturday 31 May together with Eng Magafu and Abdul Mtola of CML, accompanied by the Quantity Surveyor from the council. Internal access was not possible during this visit but an external inspection and measurements of the buildings were made. Storage areas for the laboratory equipment were also agreed during this visit and the location of the water and electricity (3 phase) supplies were identified. A backup generator exists and needs a full overhaul to determine if it can be made serviceable.

An outline schematic plan of the buildings (not strictly to scale) was prepared following this visit and is shown in Appendix 1.

A photograph of the proposed buildings in which the laboratory will be housed is shown in Error! Reference source not found..
A follow-up visit to the premises was made on Monday 2nd June together with the quantity surveyor and the council architect. Internal access was possible on this visit. The building currently has 2 internal walls subdividing the proposed laboratory area into three sections. These walls are not load-bearing and can be removed to provide the space required for the laboratory. The resulting floor area will be approximately 10.8m by 7.5m providing an area of approximately 81 m².

### 3.2.2 Recommendations/Plan

Significant alterations to the building will be required to enable it to house a laboratory effectively.

These will include (but may not be limited to):

- The construction of a ceiling to the laboratory and store rooms
- Renovation of the windows on the road-side of the building
- New windows installed to the front of the building
- New floor laid (additional strengthening in areas of heavy plant and compaction tests, plinths as required)
- New upper gable end (end of building at 2nd gate).
- New roofing
- Provision of covered area for soil handling and drying
- Electricity supply extended into building and sockets fitted throughout
- Water supply extended and connected to sinks
- Drainage works to sinks etc as necessary
- Internal fitting out with benches, cupboards, sinks, etc)

The Municipal Council architect will prepare a draft design and the quantity surveyor at the council will prepare the Bill of Quantities (BoQ). These processes will require the close liaison of PMO-RALG IDU and the Director of the DRRC.

The final internal layout of the building will depend on the location of external services. The positioning of items such as sinks will particularly depend on the location of outside drains. Thus the final internal design will also require close liaison with the architect and QS. An initial concept sketch is given in Appendix 2.

It is estimated that the above actions could take up to 6 months to complete as shown in the outline timetable for the works given in Error! Reference source not found.

### 3.3 Recruitment of laboratory staff

The laboratory manager, technicians and supporting staff will be recruited through the normal recruitment procedures of PMO-RALG. The laboratory manager and technicians should be in post by Month 4 when the renovations of the buildings have been completed so that they can assist with fitting out the laboratory and the installation of equipment. In order to achieve this it is recommended that the post be advertised by Month 2 so that interviews can be conducted and engagement made in time. Similarly, recruitment or transfer of other Laboratory staff should be made by Month 4.

An outline job description for the recruitment of the Laboratory Manager is given in Appendix 3.

### 3.4 Training laboratory staff

Facilities are available at the Central Materials Laboratory for training technicians and other staff involved in materials testing activities. In meetings attended by the consultant and the head of the DRRC with the Head of CML, Eng Mataka, he re-affirmed the willingness of CML staff to assist DRRC personnel both informally through the provision of advice and short-term support and through formal training courses arranged between TANROADS and PMO-RALG. Training should start in Month 4.
3.4.1 Recommendations/plan

Following staff appointments, training courses should be agreed with TANROADS to ensure that the laboratory manager, technicians and supporting staff are fully conversant and up to date with the current materials prospecting and sampling techniques and the prevailing test methods to be used in the laboratory.

Staff changes will occur from time to time and refresher courses for all DRRC and regional staff should be undertaken at regular intervals.

The design, construction and monitoring of road research sections may be required as part of the activities of the DRRC. The results from the research are often used to modify existing standards and specifications and there are accepted guidelines in carrying out the monitoring of trials which ensure that the information collected is reliable and can be used to update Tanzanian standards, specifications and manuals. Training in research-related activities will be important for the DRRC.

Occasionally, samples may require specialised testing by outside laboratories. The engineer and technicians need to familiarise themselves with such procedures (even if they are not carried out at the DRRC lab) so that they can evaluate the results.

3.5 Short, medium and long term capacity building programmes

The short term work plan is shown in Figure 3-2 with the main focus being on the commissioning of the materials testing laboratory. Other short-term activities for the Head of the DRRC are included in the companion report to this extension project prepared by the Team Leader.

In order to achieve key milestones it is particularly important that preliminary activities for planning and commissioning renovation works start immediately and that renovation work be completed by Month 4.

The overall medium term activities for the DRRC are set out in Section 9.3 of the Final Project Report for the project. In the context of the laboratory activities, the main item in the medium term is the establishment of regional laboratories. The actual number of these that can be established per year will depend on the resources and budget available. A budget will need to be prepared for up to 12 laboratories, by early 2015.

The longer term goals for the DRRC are set out in Section 9.4 of the Final Project Report, one of which is to establish a purpose-built laboratory. A budget request for funds to purchase the land for this building has already been made. Preparations for commissioning of design concepts and architectural drawings will be needed in 2015 so that detailed designs can be progressed for the construction.

3.6 Establishment of quality assurance mechanisms and sample tracking software

The main components of quality assurance in which the DRCC laboratory is likely to be involved are:

- Measures that ensure that the results of the DRRC laboratory tests are consistent and reliable
- Measures that ensure that testing at the Regional laboratories also meet the required standard.
- Sampling and testing samples from road projects to ensure compliance with specifications
- Periodic re-calibration of equipment.

Establishment of quality assurance procedures should be progressed along with discussions with TANROADS CML so that identical systems can be implemented. These should be developed by Month 5.

A scoping exercise is recommended to determine the requirements for procurement of a full sample tracking software package. Ideally, an off-the-shelf package would be customised to cover both Dodoma Laboratory and zonal laboratories that could be interrogated for different purposes.
**6 MONTH PLAN FOR COMMISSIONING DRRC LABORATORY**

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<td>2. Planning</td>
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<td>2.3 Interior outline plan</td>
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<td>3.1 Preparation of tender documents</td>
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<td>3.2 Advertisement of tender</td>
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<td>3.3 Award of contract</td>
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<td>3.4 Contractor mobilisation and start of works</td>
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<td>4. Renovation works</td>
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<tr>
<td>4.1 Removal of interior walls and existing roof</td>
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<tr>
<td>4.2 Construct new roof</td>
<td></td>
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<tr>
<td>4.3 Construct ceiling</td>
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<tr>
<td>4.4 Repair gable end</td>
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<td>4.5 Construct new windows (2) and repair existing windows</td>
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<tr>
<td>4.6 Construct new floor (strengthened where required)</td>
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<td>4.7 Repair walls (re-plaster as required)</td>
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<tr>
<td>4.8 Covered area (canopy) for soil handing area</td>
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<td>4.9 Paint all walls and ceiling</td>
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<td>5. Services</td>
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<tr>
<td>5.1 Connect electricity (lights, outlet sockets, ovens, air conditioning)</td>
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<td>5.2 Connect water supply (taps, etc as necessary)</td>
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<td>5.3 Construct drainage works, Connect sinks to drains</td>
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<td>6. Internal fittings</td>
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<tr>
<td>7.1 Testing and commissioning of equipment</td>
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3.6.1 Laboratory testing

It is of vital importance that the DRRC laboratory gains a reputation for reliability and that its standard of testing is recognised as being of the highest calibre.

It should set a standard to which all the regional laboratories are expected to attain and maintain. In order to achieve this goal, the responsible DRRC engineers, technicians and laboratory support staff must be trained to the highest standard and all the testing equipped must be properly calibrated and maintained.

It is advisable that from time to time samples should be sent for testing at both DRRC and CML so that results can be compared to ensure that test results are within accepted limits of accuracy. If the results are significantly different then this is likely to suggest either incorrect test methods being applied or testing equipment being out of calibration.

Similarly, duplicate samples from the regional laboratories should be tested at the DRRC laboratory for comparison purposes.

An internal Quality Management is already in place at the CML and this can be shared with DRRC but it is recognised that a formal QM system compatible with internal standards is required for both laboratories.

3.6.2 Testing samples from road projects

Most roads are funded by the people of Tanzania either directly through taxes and levies or the repayment of loans to international development partners. Large cost savings can be made by contractors if the road is built to a standard less than that specified in the documents that govern road provision in Tanzania. Most contractors do comply but mistakes and other unacceptable practices are not uncommon in the industry worldwide.

The result of roads being built to a standard less than that specified often arises through the use of substandard materials, building road layers to a thickness less than specified or compacting to a lower density than specified. Whilst these all save the contractor costs they can have significant cost implications because the road is likely to experience early failure. Such practices can easily be detected through proper quality assurance techniques such as thickness and density measurements and material testing in the laboratory.

Regular sampling along the road being constructed is imperative to ensure that the road is built as specified. This role is normally undertaken by the regional laboratories but spot checks should be carried out by the DRRC to ensure that the correct procedures for sampling, and testing and reporting of results are being followed by the regional laboratories so that procedures can be corrected and equipment re-calibrated as required.

3.6.3 Calibration of testing equipment

All equipment used for materials testing will be subject to wear with time and failure to ensure that equipment is within the specified calibration limits is often the cause of unreliable and inconsistent results. Therefore, an important factor in ensuring that the results of tests are reliable is the regular re-calibration of equipment. Equipment manufacturers often give recommendations of when testing apparatus should be re-calibrated which can depend on the number of tests being conducted or on the age of the apparatus. Whilst re-calibration should not be necessary on new equipment in the short-term, it should be a component in the longer term plans of the DRRC and regional laboratories.

3.6.4 Sample Tracking software

A paper-file system for tracking samples through the various stages of sampling, testing and reporting in the laboratory is in place at CML and consideration is already being given to replacing this with a computer-based electronic tracking system. Further investigations will be made into whether suitable software is available elsewhere, which can be tailored for use in Tanzania. If not available, then dedicated software for this purpose will need to be developed which can be used by DRRC, CML and the Regional Laboratories.
3.6.5 Recommendations/Plan

The DRRC laboratory should include in its activities provision for occasional regular duplicate testing with CML and other private laboratories to ensure consistency of test methods and reliability of results.

The DRRC should compile a list of construction projects on the District Road network so that it can plan a programme to take spot duplicate on-site measurements and samples for laboratory testing as part of its quality assurance policy for the regional laboratories.

Provision for the checking and re-calibration of equipment should be part of the longer-term plan.

Investigations into the availability of sample-tracking should be undertaken.

3.7 Collaborative links with CML

Links between the head of the DRRC and CML have already been established. The Head of CML has, on a number of occasions, confirmed that he wishes to collaborate with the DRRC and to provide assistance with the commissioning of the DRRC laboratory and in training DRRC laboratory staff. This collaboration was again evident on this visit by CML providing a technician to assist with handling the inspection and checking the equipment designated for the DRRC laboratory and in further discussion and meetings to help progress the activities required to establish the DRRC laboratory.

4. PART B: Assistance with short-term implementation plans for the DRRC

4.1 Objectives

As stated in Section 2.1 above, the overall objectives of this assignment were to assist PMO-RALG in preparing a plan to:

- Set up and operationalise the laboratory in Dodoma
- Develop a short term business plan for the PMO-RALG research centre, including quick-wins activities
- Establish the DRRC Technical Committee
- Set up a forward plan for funding priority projects with the Road Fund and Development partners.

Because the programme for the third visit to Tanzania was reorganised so that the Final Workshop was delayed to the end of the visit, it was agreed that some of the activities for the extension would be carried out during the first week of that visit and then incorporated in the Final Report. The above objectives were addressed in Section 8 of the Final Report under the following headings:

- Short term
  - Establishment of DRRC covering both urban and rural roads
  - Start-up budget
  - Organisational Structure
  - Establishment of DRRC Technical Committee
  - Establish a modern and comprehensive materials laboratory
  - DRRC structure
- Short term priority projects
  - Review of outcomes of road trials
  - Best practice for use of block paving for roads and footways
  - Review of gravel roads maintenance manuals and procedures with a view to updating
  - Develop data management systems for research projects
  - Initiate International best practice programme on demonstrations/trials, standards, specifications and manuals
Establish a knowledge management facility
Scoping studies for 4 strategic research programmes
Embedment of new AFCAP LV roads design manuals

- Short term business plan
- Medium term activities
- Long term plans

As the Final Report has essentially covered the main objectives the extension visit has concentrated on assisting moving those plans forward.

The Team Leader has been working with the Head of the Research Centre to prepare and agree further implementation actions for the next 6 month, which include:

- Review outputs of the road trials monitoring programme for forward planning purposes. Use the information to inform production of an ‘early findings’ report for better road design options.
- Start library information and dissemination activities, including basic EDMS, website, information circulation.
- Commission scoping studies for setting up a material database/inventory for Tanzania.
- Commission a review for road asset management plans and DRRC’s role.
- Agree the composition of the DRRC Technical Committee and its first meeting.
- Establish a Sub-committee on funding of research and coordination of its first meeting.

**Output:** Detailed report on progressing plans on above activities.

During the extension visit, it was agreed with the Director of PMO-RALG and AFCAP management that of overriding priority was to start communications with a range of Development Partners to arrange appropriate funding for the DRRC and its activities. Where possible, meetings were to be arranged.

### 4.2 AFCAP Steering Committee and DRRC Technical Committee

The AFCAP Tanzania Steering Committee met on Wednesday, 4th June. It reviewed Outputs of AFCAP 1 and noted proposals for consideration under AFCAP 2, including the implementation of the DRRC (and its priority projects) and the next stages of the preparation of Design Manuals for LV Roads. The following agreements were made at that meeting:

- The Steering Committee agreed to continue into AFCAP 2. Its composition would be PMO-RALG, RFB, AFCAP, MOW, TANROADS CML, T² Centre and University of Dar es Salaam.
- It would also take on the responsibilities and mandate of the DRRC Technical Committee, as set out in the Final report.
- Each participant would consult within their organisation as to whom would be the most appropriate person to attend future meetings and report back.
- The Members would study the proposals of the Final DRRC report and assist in their funding and delivery.
- A proforma for priority proposals would be developed, see Appendix 4, for use by the Technical Committee.
- DP would be invited to a workshop at a future meeting once the laboratory is established and the DRRC is operational.
- New discussions for the development of a National Road Research Centre would take place with MOW.
- Assistance would be given to MOT for the development of a Transport Research Centre project.
- The next meeting will be in 3 months and quarterly thereafter.
4.3 Progress on funding of the various components of the DRRC and its activities

The Final Report has been distributed to the following Development Partners and other relevant funders. A request has been made, on behalf of PMO-RALG, for assistance with funding relating to the DRRC (and its research activities) and also for their participation in a Development Partner Sub-committee of the DRRC Technical committee. All the DP’s have previously expressed a desire to assist, where appropriate.

A crucial element necessary for the successful implementation of the DRRC is Technical Assistance. These are required urgently to fulfil the following needs:

- Long term TA to support the Head of Research with the DRRC implementation programme; scoping and producing proposals for DP funding; administrative support; training and capacity building
- Immediate short term TA to maintain current momentum and to fill the gap between AFCAP 1 and 2
- Targeted short term specialist TA over the coming 2 years for specific activities.

The other element is around priority and long term research programmes. The following is a summary of progress and actions following discussions and meetings:

- **MCC**
  - Stacey Albohersa (DCO/EASE)
  - Jonathon Saiger (DCO/EASA)
  - Jozefina Cuturu (DCO/TSD)
  1. The above contacts wish to be copied in on future activities and will make further contact with PMO-RALG

- **DFID**
  - Sion McGeever (Advisor)
  1. DFID are contributing funds to RFB through a four year programme, IRAT, and consideration will be given to formal applications for TA inputs and for research interventions that fit with the project objectives.
  2. DFID will consider applications for funding of relevant projects from their International Climate Fund. A concept note will need to be developed addressing social impacts
  3. It is considered to be premature to convene a DP Sub-committee for the DRRC at the moment. A preferred way forward would be to concentrate on the establishment the Centre and the Laboratory for the next 6 months.

- **USAID**
  - Thomas Kaluzny (Infrastructure)
  - Boniphase Marwa (Infrastructure)
  - Richard Mwakasitu (TA)
  1. USAID are proposing to contribute substantial funds to the RFB in January 2015 once Senate approval is given and it is intended that relevant applications for funding would be made to RFB through PMO-RALG.

- **EU**
  - Fabrizio Moroni
  - Adam Grodzicki
  1. Through its approved programme of capacity building for PMO-RALG, it will invite relevant DRRC staff to attend training courses. For example, Dr Magafu is expected to attend a management training course.

- **JICA**
  - Tatsumi Tokunada (TA)
At a meeting on 13th June discussions covered how the activities outlined in the AFCAP Final Report could be linked with the current JICA 4 year capacity building programme for 2 Regions and 4 Districts. The following potential activities were identified that should be discussed at the programme mid-term review in June, with PMO-RALG:

1. To cooperate with PMO-RALG to establish a District Quality Assurance Laboratory by funding equipment and training
2. To pilot carrying out a materials survey in a District for aggregates and road maintenance materials
3. To consider the possibility of assisting develop a gravel road maintenance manual
4. Short Term TA assistance through their project consultants
5. Training of DRRC staff through their capacity building activities

- World Bank
  Yonas Chomvu
  Negede Lewi
  1. Wish to be kept informed and will consider future applications for funds.

- RFB
  Joseph Haule
  Ronald Lwakatare
  1. Will consider applications for short term TA inputs
  2. Will consider applications from PMO-RALG for support for specific activities of the DRRC

4.4 Review outputs of the road trials monitoring programme

This priority project is explained in the Final Report:

Research sections on the road network are usually designed to trial new, cost-effective and durable approaches to road provision. They usually take a long time to yield significant results and data, unless they fail prematurely or unless the research objective is in the construction process itself. However, useful indications to prospective long term performance and other important results often materialise during the first few years of the monitoring period.

The outcomes from the monitoring of the current PMO-RALG AFCAP road trials (and any other research projects carried out recently in Tanzania) should be reviewed by the DRRC with the objective of determining whether they provide ‘quick-wins’ in terms of demonstrating good performance. Even if the outputs are only preliminary, in terms of the anticipated technical benefits, it should be possible to calculate the economic benefits to date and the projected economic benefits. The purpose would be to use the information to fast track promising trials into the road network.

A review of similar projects undertaken in other countries, either through AFCAP or other initiatives, should also be carried out to help support the analysis and the projections for anticipated benefits from ongoing research projects.

Cost of review and outcomes, with implementation programme for changes and detailing: £100k
The objectives of this project are:

- To implement current knowledge and experience, from Tanzania and the Region, on the best performing characteristics of existing monitoring and evaluation programmes for LV Roads
- To scope out a long term programme of road trials and demonstration projects for funding and implementation
- To serve to raise the profile of the DRRC and consolidate its position as an established research centre if they are disseminated to the appropriate organisations.

Outputs will be used to improve current practice in designing, constructing and maintaining LV Roads with the outcome of cheaper, more durable roads with reduced maintenance costs.

Potential funders are RF, DFID (IRAT) and AFCAP.

Next steps are:
1. Produce a Broad Outline, as set out in Appendix 5 and circulate to Technical committee for support
2. Discuss with potential funders to determine level of interest, budget and programme
3. Produce a full proposal on the lines set out in Appendix 5
4. Assist with procurement of a consultant

4.5 Scoping studies for strategic research programmes

The following is an extract from the Final Report:

Section 8.4 sets out the five core programmes that address a large proportion of the research needs of PMO-RALG for the next 10 years. It is envisaged that these will be linked to national targets and objectives through a series of activities and research projects carried out over the short, medium and long term. These programmes will be continually reassessed and improved through a logical framework approach. It is proposed that each programme is studied in detail and analysed to set out an implementation roadmap through a scoping study. Each scoping study can be carried out either as separate studies or as one complete study. The outputs of this scoping exercise will guide the form and sequencing of a series of related projects to be implemented in the medium and long term.

Cost of Scoping Study, including discussions with DP’s and applications: £100k

Note: the road trials, demonstrations and monitoring programme is covered under Section 4.4 above

The objectives of this project are twofold:

- To ascertain what is known about these programmes; to define a 5 year roadmap and to agree DRRC’s role in the delivery for the short and medium term
  - National road material and aggregates database and inventory
  - Road asset inventory, condition and data
  - Climate resilience
  - Urban congestion
- To detail initial project proposals for submission to funders for approval.

Outputs will be used to kick start the core programmes

Potential funders are RF and AFCAP.

Next steps are:
1. Produce a Broad Outline, as set out in Appendix 5 and circulate to Technical committee for support
2. Discuss with potential funders to determine level of interest, budget and programme
3. Produce a full proposal on the lines set out in Appendix 5
4.6 Start library information and dissemination activities, including basic EDMS, website, and information circulation.

The Director of the IDU has stated that this is not an immediate priority, however, it is recognised that there are several steps that should be taken in the short term, as follows:

- Use of PMO-RALG library facilities to assist with collection and storage of relevant documents.
- Sharing of information and library facilities with TANROADS CML, TanT^2, Dar es Salaam University and PMO-RALG
- Establishment of a basic sub-website of PMO-RALG with links to and from partner websites. This would give basic information about the DRRC, its activities and outputs. It would also be used as a dissemination platform.
- Discussions with ICT/IT department in PMO-RALG to determine what support is available.

4.7 Initiate cost/benefit studies (e.g. LCA of gravelling verses LV Seals)

The following is an extract from the Final Report:

The evaluation of economic benefits from research projects in Tanzania is covered to some extent in the potential benefits from undertaking the short-term activity 'reviewing the outcomes of the AFCAP road trials' but it has special significance in making the case for upgrading gravel roads. Research-based evidence for lowering the traffic threshold at which upgrading to a sealed road is economically viable has proved to be influential in increasing sealed road provision elsewhere.

With approximately 80% of the road network in Tanzania reported as being unpaved, this incurs a high cost in the maintenance required to keep these roads in sufficiently good condition that ensures that access and mobility are not impaired. Research to study the performance of unpaved roads with the objective of providing evidence for upgrading at lower levels of traffic have already been identified in this report as a priority area for the DRRC. Collection of data to provide specific evidence will depend on factors such as location, material, terrain etc and are likely to be at least medium term in duration. However, by using existing information coupled with proxy data, and by the application of expert engineering judgement, it should be possible to produce a provisional case for upgrading from which a revised set of national targets could be developed.

Studies have already been carried out in various countries in this area of research (e.g. country projects by TRL/ILO), a methodology for evaluating life-cycle costs and benefits has already been developed.
Therefore, a review of this research with comparative evaluation between Tanzania and other countries of the circumstances in which the results favour upgrading could be highly beneficial and provide a ‘quick win’ in terms of the potential economic benefits for the country.

**Cost of CBA study, reporting and dissemination programme: £150k**

The **objectives** of this project are twofold:

- To use an evidence-based approach to demonstrate clear benefits and savings of upgrading gravel roads to sealed standards
- To inform government policy and targets for upgrading LV roads

**Outputs** will be used to assist implementation of new road upgrading programme

**Potential funders** are RFB and AFCAP.

**Next steps** are:

1. Produce a Broad Outline, as set out in Appendix 5 and circulate to Technical committee for support
2. Discuss with potential funders to determine level of interest, budget and programme
3. Produce a full proposal on the lines set out in Appendix 5
4. Assist with procurement of a consultant

**5. Conclusions**

This short-term assignment will now assist the newly appointed Head of the DRRC located in the PMO-RALG in Tanzania to initiate actions that will assist in the establishment of the materials testing laboratory and will assist the DRRC to achieve its implementation goals.

Various recommendations and actions have been made in the report under the various tasks assigned. These are intended to provide guidance for the short term activities required to convert the selected building sited at the Dodoma Municipal Offices into a laboratory, assist in start-up activities for the DRRC and set out a roadmap for funding and commissioning programmes and projects.

The Gantt chart (Figure 3-2) shows the critical path activities to deliver an operating laboratory in 6 months. The most important milestone is to complete all renovation work by Month 4. Provision of informal advice and assistance, as well as formal training for DRRC and Regional staff, by CML was confirmed as well as collaboration on issues such as Quality Assurance.

The RRC Technical Committee is now established and will have its next meeting in September. Research proposals will be progressed ready for submission to that meeting and TA support is being sought for both the long and short term.

The **main objective** for the next six months is to commission the laboratory and to fully establish the DRRC. That establishment includes agreed new Institutional structure, full budgeted staff compliment, designated offices with signboard, Official appointment for the Head of Research, operational website, library and ICT facilities. Once this is achieved DP’s should be invited to a Technical Committee meeting to establish a DP sub-Committee.

The names of various people met and others who contributed directly to this assignment, to whom we are grateful for their support, are given in Appendix 4. Relevant DP representative names are set out in Section 4.3.
Appendix 1: Outline external plan for new laboratory in Dodoma
Appendix 2: Initial sketch of possible internal layout
Appendix 3: Outline Job Description for Laboratory Manager

Background
The PMO-RALG is establishing a District Road Research Centre (DRRC) to conduct research, including a material laboratory. The overall purpose of the DRRC is to improve rural and urban access and mobility through the provision of cost-effective and durable roads.

The DRRC is expected to evaluate research carried out elsewhere that, where appropriate, can be adapted for use in Tanzania, whilst carrying out its own research to find solutions to problems that are specific to the road sector in the country. Many of these problems are expected to relate to the use of local materials, some of which might not meet existing standards but which could, through research, be adapted or modified for improved local use.

Thus the DRRC Materials Testing Laboratory is expected to play an important role in DRRC activities.

Responsibilities
The Laboratory Manager will have the following responsibilities.

- Managing the DRRC materials testing laboratory which is located in Dodoma
- Supervision of the laboratory staff (technicians and laboratory assistants)
- Approval and signing off test reports
- Training and Professional development of laboratory staff
- Assisting the Head of the DRRC in the quality management and supervision of Regional Laboratories
- Liaison with the Central and Regional laboratories

Qualifications
The successful candidate should possess a BSc degree and be a fully qualified professional engineer.

Experience
- At least 5 years’ experience in the field of materials testing.
- Knowledge of the standards and specifications required for road construction in Tanzania.
- Experience in materials testing, materials laboratory management, test equipment and the methods used to test road building materials in Tanzania.
- Knowledge of Local and International Quality Assurance standards that apply to materials testing in Tanzania.
- Knowledge of basic accounting and Tanzania budgeting procedures will be expected.
- Experience in research activities would be an added advantage

The successful candidate will report directly to the Head of the DRRC.
Appendix 4: Persons contributing to the assignment

Mr Sinienga, Accountant (PMO-RALG Dar es Salaam)
Engineer M Mataka, Head of Central Materials Laboratory (TANROADS - CML)
Engineer Fikiri Magafu, Head of the District Road Research Centre
Technician Abdula Mtola, (CML)
Economist Justin Lyatuu (PMO-RALG – Dodoma)
Eng Hamidu Mataka (PMO-RALG)
Eng David Sweke (PMO-RALG Dodoma)
Eng Jackson Masaka (PMO-RALG Dodoma)
Eng Emily Kagaigai (PMO-RALG Dodoma)
Procurement officer: Mr William Mboya
Quantity Surveyor: Ludigija Ndatwa (Dodoma Municipal Council)
Architect: Sasoche Matenya (Dodoma Municipal Council)
Municipal Engineer: John Nchila (Dodoma Municipal Council)
Appendix 5: DRRC Proposal Framework and Guidelines for Approval by Technical Committee

The DRRC Technical Committee will receive broad outlines of proposed projects. Those thought worthy of progression should be followed by a 4 to 6 page Proposal, excluding appendices, prepared as detailed in the subsequent sections. The Proposals should be circulated to the Committee for consideration at the following Technical Committee meeting. Decisions will be one of the following:

1. Approved
2. Rejected, with reasons
3. Further work/clarification needed for resubmission.

The proposal should clearly state the following:

- Project title (Proposal number /Date of submission and version of the proposal)
- Contact details (Name of persons submitting the proposal and their affiliation)
- Background and problem statement
- Study objectives/ scope of project
- Benefits
- Methodology
- Deliverables and implementation actions
- Project Plan
  - Time line/Project schedule
  - Cost estimate
  - Project personnel

The following sections provide guidelines on information that should be included in the various sections of the proposal and presupposes the following general guidelines.

**General Guidelines**

- Ensure the proposal is consistent and in line with the stakeholders needs;
- Ensure the proposal is in the correct format;
- Provide sufficient information to motivate the project; and
- Remember that all proposals are competing for scarce resources and will be mainly prioritised on the information provided in terms of relevance to overall strategies, potential benefits, value for money and competence of the personnel.

1 PROPOSAL IDENTIFICATION

Each proposal and version of the proposal is unique and needs to be identified accordingly to avoid confusion. Identification of the proposal should be through the following:

- Short Title
- Project number (eg DRRC 1)
- Date and version of the proposal (eg 06/06/2014v1)
- Name, contact details and affiliation of person or team preparing the proposal
2 PROJECT OUTLINE

The project outline should be covered under the following three sections:

- Background or Introduction;
- Problem Statement;
- Project Objectives.

**Guidelines for Project Outline**

**Background**

- This section should provide information that links the project to the broader goals of Strategic Research Plan and provide information specific to the priority area it addresses.
- Ensure that previous related studies are clearly identified and contextualised related to the proposal being submitted.
- If similar projects have or are currently being carried out elsewhere, the proposal should clearly indicate the differences in the projects to prevent duplication of effort.

**Problem Statement**

- Ensure that the problem statement ties in to the agreed stakeholders needs as discussed in the pre-planning meetings.
- Ensure the problem statement is relatively short and clearly defined.
- Ensure consistency between the problem statement, project objectives and deliverables.

**Project Objectives**

- Ensure consistency between the problem statement, project objectives and deliverables.
- Each objective should be clearly defined, tangible, achievable and bulleted separately.
- If the project is to be broken into several phases, the objectives of each phase of the project should be clearly identified.

3 EXPECTED BENEFITS

In this section, the benefits that the stakeholders will derive from the proposed work should be identified and described. A definition of the benefits that will be derived from the proposed work is an essential part of the project proposal, and is used by the stakeholders for the following purposes:

- To determine the likely impacts to be derived from the proposed work; and
- To facilitate or aid in the quantification of the realized benefits after the project findings are implemented.

In the evaluation, prioritisation and approval of the project proposal, the information provided in this section will be carefully evaluated to determine the following:

1. **Proper definitions:** Are the benefits to the stakeholders well defined and clear?
2. **Relevancy:** Are the benefits congruent with the stakeholders’ mission and the Strategic Research Plan?
3. **Likelihood of Achieving the Benefits:** Are the benefits achievable and realistic? This consideration is coupled to the implementation plan.
It should be noted that not all benefits need to be of a direct economic nature. Several additional indirect benefits that are aligned with the stakeholders’ mission can also be derived from technology development work.

- **Guidelines for Clear Definition of Expected Benefits**
  - As a first step to the identification of benefits, the present situation and the situation that will transpire without the benefit of the proposed project should be well understood. This situation should already be described in the background and problem statement sections of the proposal.
  - Using this information, consideration should now be given to what would change if the proposed project is executed and the findings implemented. It will perhaps help if first, thought is given to the impacts on the stakeholders and/or general practice in Tanzania. Once these impacts have been defined, the benefits that the stakeholders will derive will become clearer.
  - At this stage, the defined impacts should also be linked to the project deliverables. If this link is not apparent, this should be clarified in the definition of benefits.
  - Projects for which the outcomes are less tangible, the benefits should simply be well itemized and properly defined.
  - If the project will contribute significantly to any of the indirect benefit indicators, then this should also be clearly stated.

- **Guidelines for Ensuring Relevancy and Likelihood of Achieving Expected Benefits**
  - The relevancy of the project benefits should be shown by linking the benefits to the strategic objectives of the stakeholders and/or the Strategic Research Plan. If the proposal forms part of a larger programme of research linked to the Strategic Research Plan, the benefits should be related to the objectives of the programme wherever possible.
  - The aspects that are critical to ensuring that the proposed benefits can be achieved should be evaluated. These aspects may relate to stakeholders’ resources or actions (e.g. what the stakeholders should do to realise the benefits) or to project execution (e.g. critical results or findings needed to realise the benefits).
  - Such aspects should be defined and it should be noted how the project methodology, deliverables and implementation plan will address these aspects.

4 METHODOLOGY

The methodology section of the proposal should provide details on how the project will be carried out and provide the framework for the project plan.

- **Guidelines on Methodology**
  - Ensure that the methodology is subdivided into clearly defined and manageable phases;
  - Identify tasks required within each phase to achieve the objectives of the project and generate the likely benefits from the projects;
  - Provide a short description of what is expected to be achieved from each task;
  - Ensure the phases and tasks are consistent with the deliverables and the project plan in terms of the timeline and the cost structure.
5 DELIVERABLES

The deliverables or outputs from the project are critical to the success of the project and should be carefully considered in terms of what can be achieved and implemented.

Guidelines for definition of Deliverables

- Ensure that the deliverables are in line with the stakeholders needs as agreed at the planning meetings;
- Ensure that the deliverables are clearly defined, tangible and achievable;
- Ensure that the methodology is clearly linked to achieving the deliverables;
- Ensure that the cost estimates and payment schedule are linked to the deliverable;
- Typical deliverables could include the following:
  - A guideline report that enhances best-practice and available for feedback to practitioners;
  - A software programme that improves decision making;
  - Equipment that improves data collection and/or the precision of data collected (e.g. laboratory testing equipment; pavement evaluation equipment; traffic counting equipment);
  - Courses or training material;
  - Seminars, workshops or courses to feedback information to practitioners.

6 IMPLEMENTATION OF FINDINGS

In this section, the outline plan for implementing and marketing the project deliverables and findings should be defined. In essence, the implementation plan should explain how, where and when the project findings will be disseminated within the relevant audience or industries. If possible, the implementation plan should list specific forums, conferences, workshops, publications, journals and/or guideline documents where the projects findings can be disseminated. Ideally, the project methodology and cost estimate should include tasks which form part of the implementation plan. However, if some aspects of the implementation plan do not form part of the work proposal, this should be clearly highlighted and explained.

7 PROJECT PLAN

The project plan should provide details related to the methodology in terms of the time to complete the project, the resources to be used to achieve the deliverables and a breakdown of the costs for the various aspects of the project. This section of the proposal should be divided into:

- Timeline or Gantt Chart for the project;
- Project costs; and
- Project team/personnel.

Guidelines for the Project Plan

Timeline or Gantt Chart

- Ensure the phases and tasks on the Gantt Chart relate to those identified as part of the methodology;
- Ensure that the phases and tasks run in a logical and chronological sequence, with tasks that overlap...
clearly indicated;
- Where relevant, identify the personnel responsible for each task and phase.

Note: For smaller projects with one or two tasks and one deliverable, a date of completion of the project is normally sufficient.

Project Costs
- The project costs should be summarised in terms of the various phases of the project and should ideally be linked to the stated deliverables;
- The time and rates (hourly or daily) for personnel working on each phase and task of the project should be clearly stated with subtotals;
- Human resource fees and reimbursable or running costs should be shown separately and summarised separately in the final project cost;
- Where taxes are applicable, these should form part of the total project cost.

Project Team/Personnel
- The key personnel responsible for the management and technical content of the project should be clearly stated with a short description of their respective role and responsibilities. For larger projects, a responsibility matrix for specific phases and tasks should be included;
- Where the competence of key personnel is known to the stakeholders, the submission of CVs may be unnecessary. However, in larger, multi-organisational projects where some of the key personnel are unknown to the stakeholders, Curriculum Vitae (CVs) may be required as a separate addendum to the proposal. This issue should be clarified with the stakeholders during the pre-planning meetings.

8 CASH FLOW

The proposal should clearly state the expected monthly cash flow and, where applicable, the payment schedule. Two payment models could be considered for inclusion in the proposal, if applicable:

- A lump sum basis with interim payments against specific deliverable; or
- A time and cost basis against monthly invoices.

Guidelines on Payment Scheduling, where applicable
- Ensure that the payment schedule and method of payment are clearly stated and ties in to the project deliverable and the total project costs.
- All projects should provide a monthly cash flow in the payment schedule for management purposes.

9 APPROVAL OF THE PROJECT

Approval of the project will be confirmed by the signing of the proposal by a representative of the stakeholders and the Service Provider and will form the agreement around which the project will be managed and evaluated.
Guidelines for Project Approval

- Ensure there is sufficient space for the designated persons to sign the proposal and, if applicable, space for a witness to verify the signatures;
- Ensure that the approval statement includes the title of the project and is clearly dated;
- If applicable, ensure that all pages of the proposal are initialled by the signatories and the witness.

10 IMPLEMENTATION OF THE PROPOSAL

Following the approval of the proposal, the project will be managed in line with the approved project plan. A monthly project status report will be required for submission to the management meetings of the Road Research Centre and, where applicable, to the members of the Road Research Technical Committee who will provide strategic oversight on the execution of the project.

Guidelines

- Ensure that the monthly status report relates to the project proposal and measures progress against the approved project plan;
- Any delays to the project, changes in project personnel or variations to the approved costs should be reported to the monthly management meetings and where appropriate covered by a written amendment to the proposal that would act as an addendum to the original, approved proposal and agreement.
- Where appropriate, the proposal should be included as an Appendix to the final project report.