

# INSTITUTIONALISING RURAL TRANSPORT KNOWLEDGE AND RESEARCH CAPACITY IN SUB-SAHARAN AFRICA

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## ABSTRACT

Despite limited and declining resources since the 1980's (financial, human and capital) there have been many important research projects funded by programmes such as the Africa Community Access Programme (AFCAP), other donor agencies and national budgets. These research projects have been undertaken to advance the Africa-specific knowledge-base for the provision of road infrastructure and the associated transport services, especially in rural areas. The problem is that the valuable knowledge generated from the various projects is fragmented and uncoordinated; and resides in different organisations (including donor agencies) in different countries throughout sub-Saharan Africa and beyond.

This paper presents a framework for a formalised approach to institutionalising research management and knowledge transfer activities at a national level in sub-Sahara Africa. In addition, a coordinated approach is presented to harness the vast amount of fragmented information that has been generated throughout the region for better use and implementation. In this regard, it is recommended that a structure of national research centres should be established. The national research centres would receive technical assistance and support from regional coordinating research hubs under the oversight of the regional economic communities.

## 1 INTRODUCTION

The Africa Community Access Programme (AFCAP) funded by the UK Department for International Development (DFID) was launched in June 2008 for an initial five years. The aim of the programme is to address the challenges of providing reliable access for poor communities in Africa. As part of its remit, AFCAP provides;

- Advice and support for applied research to address rural access constraints;
- A communications outlet of research findings to stakeholders; and
- Support for the mainstreaming of research results into practice.

The primary goal of AFCAP is sustained economic and social development; poverty reduction; and improved quality of life of the rural poor through more effective, efficient and equitable access to socio-economic opportunities and services such as health and education. To achieve these goals AFCAP strives to deliver an integrated, wide-ranging portfolio of research, dissemination and training activities.

Despite limited and declining resources since the 1980's (financial, human and capital) there have been many important projects for research and technology

development. These projects have been undertaken to advance the Africa-specific knowledge base for the provision of road infrastructure and the associated transport services, especially in rural areas. The problem is that the valuable knowledge that has been generated is fragmented and uncoordinated, and resides in different organisations (including donor agencies) in different countries throughout sub-Saharan Africa and beyond. The decentralising of decision making and the creation of roads and transport authorities or agencies, allied to the lack of a suitable library and information dissemination structures in most countries, has compounded the situation. The consequence is an increased need for a coordinated approach to generate, capture and transfer appropriate technologies and knowledge for the optimal provision of infrastructure and services for the road transport sector. Without a suitable transfer and feedback mechanism to establish research finding in practice, the value of the research is greatly diminished (Jooste et al 2005).

It is, therefore, critically important that relevant organisations and institutions within Africa both at national and regional levels take responsibility for knowledge generation, transfer and implementation. Returns will be optimised only through an established and sustainable institutional structure representing the countries that will benefit from the research investment.

The purpose of this paper is to build on the lessons learned from the current AFCAP programme and provide guidance for future phases of AFCAP. The paper addresses the following:

- A review of knowledge transfer processes that have been used to successfully implement primary research findings and outputs in practice;
- The need for a sustainable source of African knowledge; and the transfer of that knowledge, through the institutionalising of research and centres of research in Africa.
- A framework for knowledge transfer and implementation of research and technology development findings to maximise the benefits of research investment.

## **2 AFCAP RESEARCH INTO PRACTICE**

Geddes (2013) highlighted several case studies in AFCAP member states that demonstrated the shortcomings of inappropriate design standards and specifications based on mainly European and North American practice. Costs of US\$ 1 million per kilometre for a 2-laned paved rural road were quoted in the paper, with even higher costs being experienced in mountainous areas of countries such as Ethiopia where extensive earthworks and difficult terrain add significantly to the already high construction costs.

There is no doubt that if the goals of AFCAP are to be achieved, it will be essential for practitioners to adopt more appropriate practices for the provision, upgrade and maintenance of rural access roads. It is also highlighted that existing practice will only change if new standards and specifications are published in official national documents, and client bodies insist that their contracting and consulting organisations are aware of the revised documentation; are trained in their use; and enforce their usage.

As a consequence, one of the main focus areas of the current programme has been on the development and implementation of appropriate design standards for low

volume rural roads generally carrying less than 300 vehicles per day. The objective is to minimise the cost of providing all-weather access by utilising local materials in the road pavement layers and surfacings.

Research has shown that gravel road surfacings are often an unsustainable option due to inappropriate specifications and practice (especially related to oversized materials larger than 37.5 mm); the depletion of suitable gravel reserves; and increasingly longer haul distances to locate materials. In addition, well-drained sealed roads have lower life-cycle costs compared with gravel roads due to lower maintenance costs and lower vehicle operating costs. The research findings have challenged conventional pavement design approaches and identified a range of surfacing options that could further reduce construction and maintenance costs.

It should also be noted that while most of the AFCAP research has related to rural infrastructure provision, AFCAP also recognises the inter-dependence between engineering and transport-focussed research. The project portfolio is structured to accommodate both in an effort to ensure that communities truly benefit from improved transportation services.

A cost/benefit analysis undertaken by DFID in Mozambique identified a range of benefit-cost ratios from 1.5 to 3.1 on investments made by DFID in AFCAP research projects, with an annual rate of return of 27%-59%. This supported similar conclusions reached by Jooste et al in an independent study done in South Africa, the findings of which are summarised in Table 1.

**Table 1: Benefits from Research/Technology development projects in the Roads sector (Jooste et al, 2005)**

<b>Annual Paved Road Network Rehabilitation (km of lane-km/year)</b>	<b>Benefit/Cost ratio</b>
150	>1.0
250	1.6 to 2.4
500	3.2 to 4.9

The identified benefits from the research projects were:

- Cost reductions:
  - Lower construction and maintenance costs;
  - More resilient materials (and therefore lower maintenance needs).
- Higher benefits to road users (road performance improvement) through:
  - Fuel savings;
  - Reduced damage to vehicles;
  - Time savings (faster travel).

### **3 KNOWLEDGE TRANSFER**

For the purpose of this paper, Knowledge Transfer (KT) is defined as:

*A dynamic and iterative process that includes analysis, dissemination, exchange and application of knowledge for the roads and transport sector.*

Although very little evidence of KT frameworks specific to the roads and transport sector can be found in the literature, similar problems and parallels can be found in

the health sector and summarised in Orem et al (2012) based on a study in Uganda. The relevant facilitating factors for KT (or in their context Knowledge Translation) are summarised as follows.

- **Institutional Strengthening:**
  - There is a need to build the capacity of policy and decision makers in the research process so that they understand the evidence from research that underpins their decision.
  - A formal linkage with all stakeholders is required through an institutionalised platform for systematic dialogue and engagement.
  - There should be a central coordinator of research and evidence generation, dissemination and implementation embedded within the most appropriate government department, agency or authority.
  - Reduction in the bureaucracy of the decision making process is required.
- **Research Findings:**
  - The scientific soundness, relevance, timeliness, comprehensiveness of evidence and the feasibility for implementation are critical.
  - The credibility, standing and reputation of the researcher(s) is important.
  - The organisation that commissions the research tends to dictate how seriously the findings are taken. Generally, if the work is commissioned by the relevant government department or a donor programme linked to the department, the research will have more credibility.
- **Dissemination of Results:**
  - Research evidence should be well packaged, using multiple dissemination channels as appropriate, that are tailored to different audiences.
  - All stakeholders should be part of the dissemination process.
  - Advantage should be taken of existing forums and dissemination channels, both formal and informal.
  - A well-informed and knowledgeable civil society should be included in the dissemination process because of their roots in communities, advocacy and their ability to mobilise communities and pressurise policy makers into implementing evidence.
  - Responsibility for dissemination should be assigned within the relevant government department.
  - Dissemination is a process that should be planned at the beginning of the research process.
  - Funds need to be made available for dissemination.
  - A “champion” of the research within government linked to decision makers greatly enhances the likelihood of dissemination and implementation.

- **Partnerships:**
  - All relevant stakeholders should be involved in the whole research process from setting the research agenda to policy development and implementation of findings.
  - Stakeholders should include representation of the communities who are the likely beneficiaries of the research.

AFCAP has demonstrated that well-researched and implementable evidence can play an important role in guiding investment decisions and improved service delivery in the rural transport sector. This is important in low and middle income countries where resources are constrained and informed decision making is paramount, especially when competing for funding with other sectors of the economy such as health, education and defence.

Several knowledge transfer models can be identified from the sector, but their success in translating research findings into practice and showing tangible benefits to the decision making and delivery process has been mixed. In most cases knowledge transfer occurs on an ad hoc basis, and there is no formal approach that explains the knowledge transfer system from establishing the research agenda to final implementation of research findings and measurement of the impact. Much of the success of AFCAP has been its ability to ensure that appropriate knowledge and solutions generated as part of the programme, or refined/incorporated from previous studies, has been transferred and implemented in practice. It is important to capture this process and formalise it into a framework for future use and refinement.

#### **4 THE AFCAP EXPERIENCE OF KNOWLEDGE TRANSFER**

A survey was undertaken of a representative sample of AFCAP participating countries to investigate the formal processes that are in place nationally to manage research, disseminate the results and implement the findings. The main conclusions are summarised in Table 2.

Two regional conferences were also organised as part of the AFCAP commitment to knowledge sharing and transfer: in Ethiopia in November 2010 and in Mozambique in July 2012. The proceedings can be found on the AFCAP web site [www.afcap.org](http://www.afcap.org). The purpose of the conferences was:

- To share knowledge from the various country programmes;
- To create a network of knowledgeable, regional practitioners;
- To promote the uptake of sustainable roads and transport-related research capacity on a national and regional level.

**Table 2: Summary of Knowledge Transfer Survey in AFCAP Participating Countries**

Item	Summary of Responses
Current research management structures	<ul style="list-style-type: none"> <li>• All countries have or are in the process of establishing an organisation for research and knowledge generation. Some countries have research centres as part of government structures; and some have assigned responsibility to established Technology Transfer (T<sup>2</sup>) Centres.</li> <li>• Only one country surveyed had a formal research management structure to oversee the national research agenda, project approvals, quality assurance and Knowledge Transfer mechanisms.</li> <li>• Only one country had a formal advisory structure (Research Steering Committee) to include external stakeholders in deciding the research agenda and assist in the project review process.</li> </ul>
Research needs identification and prioritisation	<ul style="list-style-type: none"> <li>• Research needs are mainly decided on an ad hoc and informal basis through interactions with the relevant stakeholders and practitioners.</li> <li>• Questionnaires and formal meetings were used by one country to provide a more formal structure for needs identification.</li> <li>• Only one country had a formal process for prioritising needs in line with agree weighted priority indicators.</li> </ul>
Knowledge Transfer processes	<ul style="list-style-type: none"> <li>• The main forms of knowledge transfer are through best practice manuals and seminars/workshops. Conferences, training courses and regular research newsletters are also used in one instance.</li> <li>• There is no formal library or Knowledge Information Centre for management of knowledge and documentation related to roads and transport in any of the countries surveyed.</li> <li>• One country has established formal links with international road research organisations through MoUs to support capacity development; mentorship; and knowledge transfer initiative, and is in the process of developing a Knowledge Information Centre (KIC) as part of its Research Directorate.</li> <li>• Technical Assistance from local and international experts is used in some instance.</li> </ul>
National Roads and Transport research capacity	<ul style="list-style-type: none"> <li>• Most research is managed by the responsible government department or organisation; and through universities where a pavement engineering and/or geotechnical capability exists.</li> <li>• Local and international consultants and research organisations also undertake contracted research projects managed by the responsible organisation or department.</li> <li>• Basic laboratory equipment suitable for some research activities is available in all countries.</li> <li>• Funding for research in some countries is only available from programmes such as AFCAP.</li> </ul>
Promotion and awareness of the need for road and transport research centres	<ul style="list-style-type: none"> <li>• All countries surveyed identified the need for a national road research centre, or similar, with linkages to similar organisation throughout Africa and globally, for road research coordination, knowledge sharing and transfer.</li> </ul>

The following outcomes and recommendations from the conferences have been used as inputs to the framework and recommendations presented later:

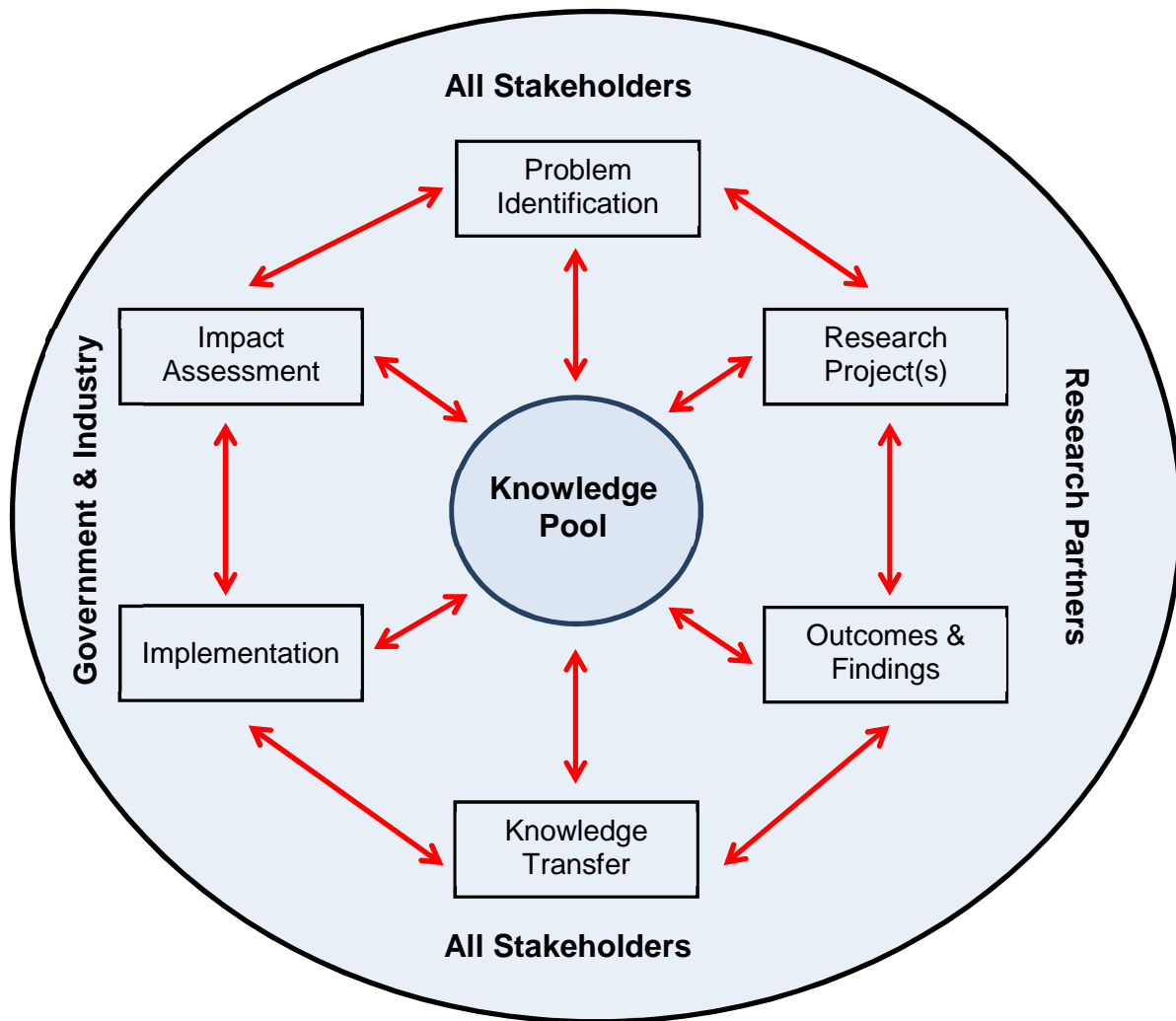
- AFCAP is making significant incremental progress in promoting research and knowledge transfer for improved decision making in member countries;
- DFID was urged to continue its leadership role in supporting AFCAP for at least the next 5 years and continue to facilitate the building of research capacity and knowledge sharing throughout sub-Saharan Africa.
- Attention needs to be given to promoting the benefits of rural transport related research to policy makers.
- Any regional coordination structures for research should be developed within current established organisational structures. ARMFA (African Road Maintenance Fund Association) is a widely representative organisation and should be considered to provide the broader coordination role for research in the region.
- For research in sub-Saharan Africa to become sustainable, countries must be capable of generating their own research funding and become less dependent on donor funding. National Road Funds should be encouraged to provide sustainable funding for research from the revenues collected. The future role of development partners will be to support capacity development rather than the direct funding of research.
- The number of participating countries in AFCAP should be increased to provide a broader knowledge base. Expansion of the programme into West African countries was suggested.
- A central web-based source of reports and information should be developed. Clear roles and responsibilities need to be assigned as to how this regional knowledge-source would be managed on a sustainable basis.

## **5 FRAMEWORK FOR MANAGING RESEARCH AND KT**

As indicated earlier, it is now generally accepted that implementable and sustainable research specific to the unique conditions of Africa is critical to the provision of an appropriate and well maintained rural road infrastructure and associated transport services. The information emanating from research and technology development projects should be specifically targeted at improving the decision making process; and reducing the risk associated with those decisions; whether they be related to policy development, planning strategies, material selection, design options, construction and maintenances practice or transport service provision. It is also important that any decisions are based on appropriate African evidence and knowledge and not from inherited often inappropriate, international practice.

For this to be a reality and institutionalised by governments at national level, a framework needs to be developed and accepted at many different levels to ensure consistent implementation. It is also important to note that the research and technology development process, including knowledge transfer and implementation is non-linear. It is iterative and updatable as new knowledge and information becomes available. The basic process is shown in Figure 1.

The recommended framework and actions for managing a sustainable national research capacity for knowledge generation and transfer is shown in the following sections.



**Figure 1: Basic Knowledge Development and Transfer Model**

## 5.1 Institutionalising Research

### **Step 1:**

Ensure the relevant Government Department, Agency or Authority responsible for the overall management of the roads sector is committed to research and the development or customisation of knowledge for improved decision making. This commitment should be clearly stated in overarching national strategy and policy documents for rural roads and transport.

### **Step 2:**

Ensure that there is a specific section, department or directorate within the relevant government department responsible for Research and Knowledge Transfer (R&KT) with clearly defined roles and responsibilities. A clear strategy is needed for managing and undertaking research projects (in-house v consultants), coordinating research projects and feedback to decision makers, practitioners and other stakeholders.



**Step 3:**

Ensure that there is a sustainable source of funding for R&KT from the national budget. Where Road Funds have been established, discussions and agreements may be required to allocate a percentage of funds from this source for R&KT. It is recommended that future funds from donor programmes such as AFCAP are targeted more at technical assistance and mentorship than the appointment of consultants to undertake research projects. The research projects should be managed and undertaken by local researchers (in association with local universities where relevant) supported by experienced international experts.

**Step 4:**

Ensure there is a formal structure for stakeholder involvement. Normally this would be through an advisory committee of relevant stakeholders that would meet on a regular basis to assist in needs/problem identification; providing focus to research projects; providing technical comment and review of outcomes from research projects; and to oversee in the KT processes.

**Step 5:**

Develop well documented and inter-linked national policies, strategies, technical guidelines, standards and associated drawings, specifications and bidding documents for the sector. The development and updating of these documents and procedures provides the foundation for KT and the formal implementation of research findings.

## 5.2 Developing the Research Agenda

**Step 1:**

Ideas for research projects may arise at any time and from a multitude of sources. Whatever the source, it is important to ensure that formal structures are in place to capture and manage the identification of problems and needs. This could be through internal sources within for the various government departments responsible for the road network and external sources such as Contracting and Consulting Associations, Representative Industry Bodies, Relevant Statutory Councils or Bodies, Tertiary Institutions, Road User Groups and Community Bodies.

**Step 2:**

The organisation responsible for research coordination should compile a list of research titles with short one page summaries of the proposed projects.

**Step 3:**

Develop a prioritisation process including a weighted ranking procedure. This may include a relatively subjective assessment of the project against factors such as overall strategic goals, likelihood of success and implementation, available resources, timing and estimated cost. This is the first filter of ideas and is essential to allow a decision to be made on which projects should be undertaken immediately and which could be phased into a programme over say a 3 or 5 year period to fit into budget allocations.

**Step 4:**

Develop a 3 to 5 year programme of projects. Ideally, the programme should contain a balance of short, medium and longer term projects. It is important that the programme is sufficiently flexible to accommodate new projects and ideas that may arise.

**Step 5:**

Present the agenda or programme of research for agreement and approvals through the formal structures of stakeholders.

**Step 6:**

Develop detailed project proposals including methodology, resources, budget, KT interventions and implementation plan in line with the agreed programme.

**Step 7:**

Obtain final approval from the oversight committee of government or client body.

**Step 8:**

Manage the project against agreed deliverables with regular feedback through the established formal structures and committees.

### 5.3 Knowledge Transfer and Dissemination

**Step 1:**

Assign responsibility for the management of KT to the government department or directorate responsible for research.

**Step 2:**

Establish a Library and/or Knowledge Information Centre to manage KT within the research department with a suitable database structure and web site. Linkages with other relevant local, regional and international information sources need to be established to access relevant documentation.

**Step 3:**

Ensure that the methods of KT and implementation of the findings are included in the original project proposal and costed accordingly in the overall project costs.

**Step 4:**

Identify partners that could be involved in the KT process. This could include local and regional networks and organisations; professional bodies, industry associations; or academic institutions.

**Step 5:**

Ensure that all relevant stakeholders are involved in the KT process. Typical KT interventions are:

- Stakeholder workshops either during a project to gather information and to test ideas; or at the end of the project to feedback findings.
- Regular newsletters to keep the stakeholders apprised of the progress with research projects and to create awareness of latest knowledge;
- An up-to-date web site allowing access to, and downloading of, soft copy of all relevant national documentation and providing linkages to other information sources.

- Publication and distribution of new manuals, guidelines, standards and/or specifications;
- Amendments to existing manuals, guidelines, standards and/or specifications;
- Publication of papers at conferences and in technical journals;
- Organisation of national and regional conferences for feedback of latest best practice.
- Training courses. These could be funded as part of specific projects or may be required later in the process once the research findings have been tested and modified over a period.
- Input to the development of University curricula.

#### 5.4 Impact Measurement and Review

Competition for funds for research in a climate of strict economic constraints dictates that there is increasing pressure to demonstrate that the research is effective and providing “value-for-money”. Decision makers increasingly need to know that their support of research is contributing to the national well-being in measurable and demonstrable ways with benefits that are greater than those which would accrue from alternative investments. It is noted that supplying the necessary information for measuring impact is difficult due to the complexities of research, KT, application and the overarching socio-economic environment into which the findings are applied (Jooste et al, 2005). Despite this the following steps are recommended in the measurement process.

##### **Step 1:**

Identify a suitable method of measuring impact. Possible methods are:

- Measurable output criteria/indicators and benchmarking;
- Expert/Peer Review;
- Anecdotal evidence;
- Case studies;
- Cost-benefit analysis;
- Stakeholder and commercialisation surveys.

While there are many possible measures of impact of research, none will provide undisputable results. Evaluations carried out at different times can produce widely varying results and conclusions. It is therefore necessary to select a method(s) best related to the purpose of the assessment exercise and the level at which the information will be used.

##### **Step 2:**

Develop specific methodologies and indicators related to the chosen method(s) of impact measurement.

##### **Step 3:**

Collect and analyse appropriate indicator data.

##### **Step 4**

Identify suitable feedback mechanisms of the impact of research to politicians, decision makers, clients and stakeholder groups.

## 6 REGIONAL COORDINATION

There is a vast amount of information and best-practice knowledge specific to sub-Saharan Africa than can be customised for national use in manuals, guidelines, design standards and specifications. However, for this to be effective it is recommended that a formal structure be established to facilitate knowledge transfer throughout the region and optimise the resources required to provide a workable and efficient KT infrastructure.

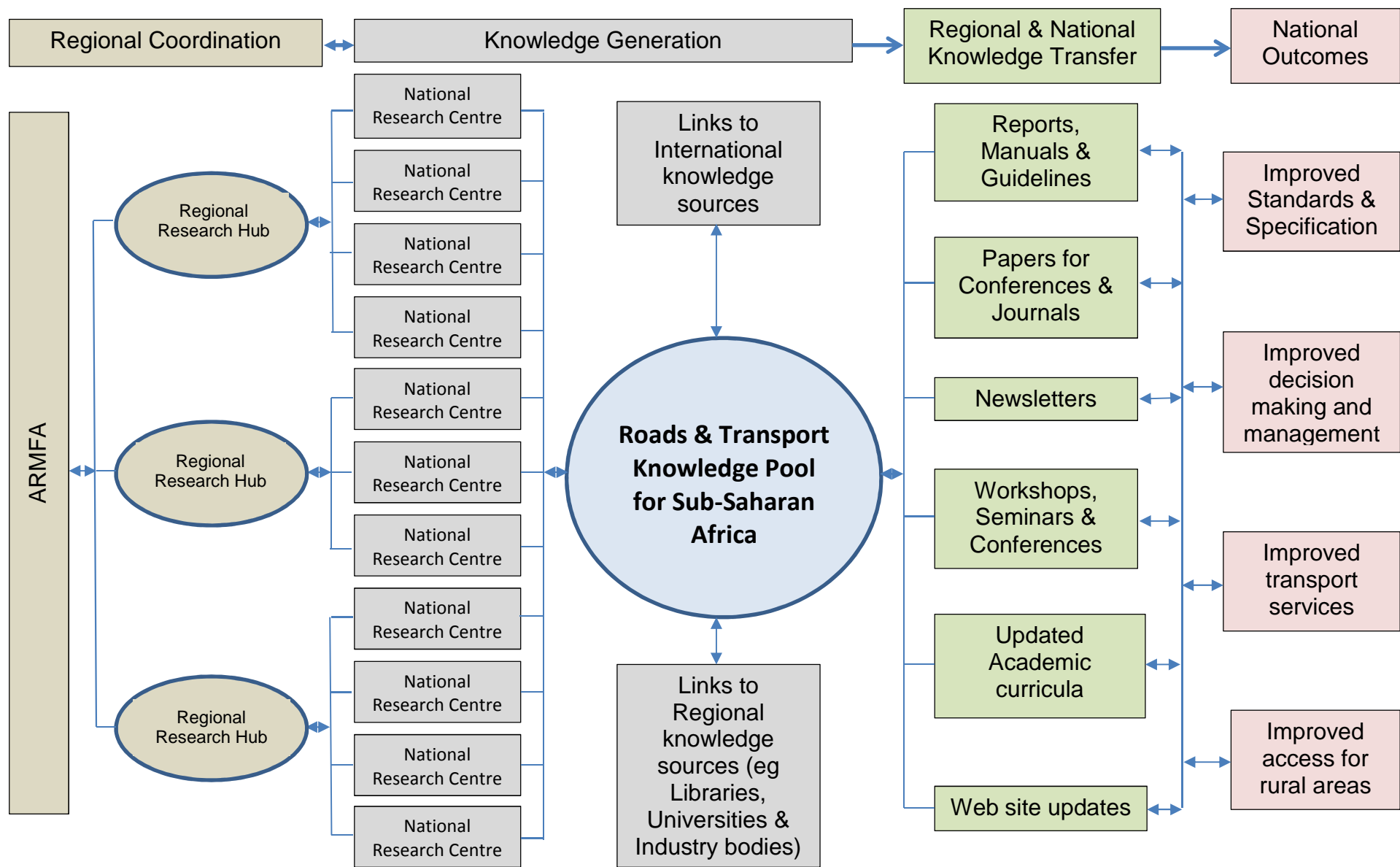
The coordination process presupposes that there are supportive national governments and champions within those departments that are committed to innovation and improvement through the implementation of appropriate technologies and research findings.

Based on discussions with AFCAP participating countries, there is no doubt that one of the major constraints to the development of national research centres and programmes is the lack of qualified and experienced individuals to manage and undertake research projects. This is compounded by the lack of post-graduate pavement engineering qualifications at most African universities outside South Africa. Governments are unable to provide competitive packages to attract talented and committed individuals required for successful research organisations.

In the short to medium term there seems to be little option but for funders such as AFCAP to provide technical assistance from suitably qualified individuals (either local or international) and established international roads and transport research organisations for training and mentorship of local staff. Shared assistance to more than one country could also be an option.

The following regional structure is proposed and summarised in Figure 2:

- Establish national road research units. In some countries this could be based on existing materials testing laboratories and/or Technology Transfer (T<sup>2</sup>) Centres. The basic equipment required for research projects will already exist and it is a workable option to retain and build materials testing capacity within government structures.
- Create a regional coordinating structure through an existing organisation such as ARMFA.



**Figure 2: Regional Coordination Framework for Knowledge Generation and Transfer**

- Establish regional research hubs linked to the national research centres. The hubs would provide technical support and specialist equipment which could be used for national projects within the hub or for joint regional projects. The regional hubs would coordinate a consolidated list of projects and outcomes within their region and coordinate KT initiatives. Regional training and education hubs aligned to Universities and Centres of Excellence could also be developed, as suggested by Brushett et al (2004).
  - A Southern Africa hub would likely be based around the existing Council for Scientific and Industrial Research (CSIR) facilities in South Africa with oversight by the Association of Southern Africa National Road Authorities (ASANRA). National research centres in the member states of ASANRA would link into the hub.
  - An Eastern Africa hub could be based at the Ethiopia Road Research Centre (ERRC), which is currently being established by the Ethiopian Roads Authority, or at the Kenya Transport Research Centre, which is also under development. Construction of new facilities for the ERRC is expected to be completed by the end of 2015. Countries that could be linked to this hub include Uganda, South Sudan and Rwanda.
  - A Western/Central Africa hub still needs to be investigated and developed. It would likely serve predominantly francophone countries in the region.
- Current funders of regional research programmes such as AFCAP, the EU and the World Bank will need to facilitate and support this process in the short to medium term both at regional and national levels.

## 7 CONCLUSIONS

Without a defined framework for a coordinated approach to knowledge generation and transfer, the benefits that could accrue from investments in research will become sub-optimal. In low and middle income countries, where competition for scarce resource is high, it is important that sectors of the economy such as roads and transport are well placed to motivate and promote the benefits of a coordinated approach to research and knowledge transfer.

With this in mind, and based on 5 years of experience with AFCAP, a framework is presented that formalises the approach to institutionalising research management and knowledge transfer activities at a national level. Fundamental to the framework is the development of national research centres to coordinate knowledge generation and ensure uptake of new knowledge through national policies and strategies.

It is also proposed that a structure of national research centres linked to regional coordinating hubs should be established. This would provide a mechanism to harness the vast amount of fragmented information that has been generated throughout the region for better use and implementation. The regional hubs would provide technical assistance and support to the national centres. Sustainability would be ensured through oversight by existing institutions representing the regional economic communities.

## 8 REFERENCES

Brushett, S; Sampson, L; and Waitaka, S (2004). Building Capacity in Management and Financing in the Road Sector: *Meeting the Challenge*. Sub-Saharan Transport Policy Program Note 37 (August 2004).

Associacio Catalana d'Universitats Publiques (ACUP). Innovation and Knowledge Transfer in Africa. ISBN 978-84-615-9053-7

Ethiopian Roads Authority (2011). Design Manual for Low Volume Roads, Final Draft, Addis Ababa, Ethiopia (April 2011).

Geddes, R. Building a Rural Road Research Community in Africa. 6<sup>th</sup> Africa Transportation Technology Transfer Conference, 4 to 8 March 2013, Gaborone, Botswana. Draft. (2013)

JOOSTE, F, Sadzik, E. and Sampson, L. Evaluation of Benefits Arising from Pavement Associated Technology Development Work. Proceedings: 24<sup>th</sup> Southern Africa Transport Conference, 11 to 13 July, Pretoria South Africa. (2005)

JOOSTE, F. and Sampson, L. Assessment of HVS Programme Benefits: Pilot Study Report. Directorate Design, Department of Public Transport Roads and Works, Gauteng Department of Transport , Pretoria, South Africa (draft Project Report). (2004)

OREM, J N et al. Research, Evidence and Policy making: the perspective of policy actors on improving uptake of evidence in health policy development and implementation in Uganda. BMC Public Health 2012, 12:109. Research Article with Open Access. (2012)

OUNJIAN, M.L. and Carne, E.B. A Study of the Factors which Affect Technology Transfer in Multi-Location Multi-Business Unit Operation. Technical Management Notes. IEEE Transactions on Engineering Management. Vol EM-34, No 3, August, 1987. (1987)