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Sida Review

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The National Research Fund (FNI) as a Tool for Research Capacity Building in Mozambique

An In-depth assessment of Sida support to Ministry of Science and Technology, MCT within the Research Cooperation with Mozambique

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Foreword by Evaluators

Our task has been to make an in-depth assessment of Sida support to Ministry of Science and Technology, MCT within the Research Cooperation with Mozambique, with the purpose of evaluating the relevance for a future support from Sida and to give recommendations for improvements. Special attention has been paid to the role of National research Council, FNI, its objective, institutional setting and operations and dissemination of results. We have also looked at the role of the Regional Centres for Science and Technology (CRCTs), and tools of promoting science, technology and innovation governed by the Ministry of Science and Technology, MCT.

The assessment has taken place during March and April, 2010 and in close collaboration with MTC/FNI, the Swedish Embassy and Sida. We would like to express our gratitude and satisfaction with the support we have received from MCT and FNI in organising a very tight programme and also provide a good mix of activities from local visits in the agricultural sector and research environments to the FNI-setting as well as introductory meeting and follow up at the Ministry of Science and Technology, MTC.

Our overall assessment is that FNI, considering contextual and infrastructural factors, well lives up to what can be expected from a very young national research funding organization, both in terms of research administration and management of funds and since the start it has made substantial progress in the development of its institutional context and good practices in operations. It is, however, still an obvious need to continue to work with the development of an optimal model for STI-support and management of FNI in Mozambique. Thus, our assessment also comprises recommendations for future development of FNI.

Stockholm and Luleå April 2010

List of Acronyms and Abbreviations

CNAQ	National Council of Accreditation and Quality
CRCT	Regional Centres for Science and Technology
Danida	Danish International Development Assistance
EU	European Union
FAS	Swedish Council for Working Life and Social Research
FINIDA	Finish Ministry of Foreign Affairs- Development Cooperation
FNI	Mozambique National Research Fund
FORMAS	Swedish Research Council Formas (Environment, Agriculture, Spatial Planning)
GNP	Gross National Product
IFS	International Foundation of Science
INED	National Institute of Distance Education
IMF	International Monetary Fund
MCT	Ministry of Science and Technology
MEC	Ministry of Education and Culture
MOSTIS	Mozambique's Science, Technology and Innovation Strategy
MZM	Mozambique Metical (currency)
NDCT	District Nucleus of Science and Technology
NPCT	Provincial Nucleus of Science and Technology
OECD	Organisation for Economic Cooperation and Development
PARPA	Mozambique's PRSP/Strategy for the Reduction of Absolute Poverty (Plano de Acção para a Redução da Pobreza Absoluta)
PARPA I	Poverty Reduction Strategy Paper, 2001–05 (Plano da Acção para a Redução da Pobreza Absoluta, 2001–05)
PARPA II	Poverty Reduction Strategy Paper, 2006–09 (Plano da Acção para a Redução da Pobreza Absoluta, 2006–09)
SAREC	Swedish Agency for Research Cooperation with Developing Countries
Sida	Swedish International Development Cooperation Agency
STIFIMO	Programme of Cooperation in Science, Technology and Innovation between Finland and Mozambique
UEM	University Eduardo Mondlane
US	United States of America
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WB	World Bank
VINNOVA	the Swedish Innovation Agency,

Executive summary

Background and Terms of Reference

Sida has during the last decade made substantial support in the development of research capacity in Mozambique by programmes directed towards the higher education sector to promote research environments and junior research careers at university level. During the last years, a special initiative has been launched for building of research systems and this has been done by a support to the Ministry of Science and Technology (MCT). As a result of this support a strategic document, MOSTIS, was presented by MCT and a part of the strategy includes the creation of an infrastructure for a national research foundation (FNI). Such an organization gives options to apply for research and innovation grants in open competition as well as for the general promotion of science, innovation and technology. The main purpose of this report is to make an in-depth assessment of research cooperation with MCT and an institutional assessment of FNI and its management system. The assessment, which covers the period 1 October 2007 to 30 November 2009, has a formative and supportive profile and contains also recommendations for future development.

The assessment project has been going from March to April 2010 and comprised, in addition to document analysis and follow-up interviews, a visit to Maputo, Mozambique between March 12 and 20, 2010. During this week, interview and discussions took place with around twenty persons, including employees at MCT, executive director and staff at FNI, staff at UEM, Scientific Technology Council, as well as researchers and external evaluators for FNI-proposals, and finally, local site visits to some projects of relevance. Basic policy documents and manuals have been made available in English and interviews and site-visits have been performed in a climate of open dialogue and open understanding.

A list of questions and examples of comments from persons interviewed and relevant reference documents is presented in the appendices. The persons interviewed were selected with reference to their position in relation with the FNI functions, i.e. to give their view on the performance of FNI. It is not possible to judge how representative the interviews and visits were, but it is assumed to give a fair image of FNI and its function.

It has not been possible, and it has not been the aim, to make an evaluation of the scientific quality and social impact of research channelled through MCT/FNI. The general volume of projects is still rather low and it is also in many cases too early to assess the scientific outcome. The design of the assessment is a combination of an in-depth study and process evaluation, providing guidance for Sida and MCT/FNI for further development and capacity building for research investments in Mozambique. A crucial component is also the process of donor collaboration and the mixed donor support and its impact on FNI.

Functions that have been evaluated include:

- The planning and budgeting process, the regulation, mandates of operations, documentation.
- Procedures for selection of activities and research projects to be supported from Sida funds.
- Provisions for appropriate procedures for avoiding conflict of interest.
- Assessment of how the reporting of results after completed research projects is administrated, disseminated and used.
- The transparency in the distribution and administration of funds and the corruption risks.
- Appropriate measures to prevent management from overriding control mechanisms.

Administrative Processes and Budget

The assessment of the scientific and administrative processes mentioned above, has to be related to a number of institutional and contextual factors. Firstly, it has to be stated that FNI is a young agency that has been developed within MCT and, since its start, has been subject to a continuous development. Secondly, its management functions and processes are heavily dependent on the general system for public management and financial transactions in Mozambique, a field that also is subject to continuous development and reform. Thirdly, the ICT-capacity in Mozambique in general, and in the public sector in particular is setting constraints for many activities. Fourthly, financial and economic restrictions in general, also determine the capacity level for FNI in this context. Finally, the low scientific level in Mozambique with reference to international standards, including low number of PhD-holders, even fewer senior scholars, weak university sectors and resources for research environments, also have impact on the FNI-activities and progress.

The first task is to assess the planning and budgeting process, the regulation, mandates of operations and documentation. The general impression is that these procedures are of good quality and being carried out in a professional way, within the above mentioned contexts.

It is important to make a distinction between the governing structure and mandate of MCT/FNI and the process of operations. Taking into consideration, that FNI is a relatively new body, it is understandable that FNI operations are taking place in close cooperation with MCT and also that the Ministry makes the final decision on the suggestions for approved research projects. In the long run, however, an increasing FNI independence is needed.

On a more general level, it is important to analyse how the FNI-budget is constructed. Major contributors are World Bank, Sida and Finnida. Support to the higher education sector in general is also provided by a number of other donors. A major challenge on the way towards economic independence is the contribution from MCT and the Mozambique Government to FNI and its operations. Today, significant support is given to facilities and staff at FNI, while the allocation of resources to research grants, still is low.

Open Calls and Selecting Projects of High Scientific Quality and Relevance

The procedures for selection of activities and research projects to be supported from Sida funds are developed in accordance with normal standard in the field of research administration. Project applications are subjected to open calls, applicants are informed about the availability of resources for research and innovation, external reviewers are used to assess relevance and quality of the applications and a steering committee make recommendations for projects to be supported. A scoring model is used to give structure to the evaluation process. The final decisions for approval or rejection are made by the Minister for Science and Technology. There is a strong impression of FNI seen as a legitimate, professional and competent agency for the promotion of research in Mozambique. Trust and confidence are crucial factors for the quality of FNI. Still, the function of FNI should be better presented to the researchers.

As has been mentioned above, the university sector in Mozambique starts from a low level by international standards with regard to research environments, PhD-holders and senior scholars. This fact has direct impact on the access to scientifically qualified external reviewers. Since most applications also are written in Portuguese, the international pool of reviewers is limited.

There has been some indications of that some of the priority areas may not be fully represented among the approved proposals. To avoid this there may be a need to focus on the different priority areas in the calls. Since the capacity of administration at FNI prevents the possibility of annual call for open applications this may be done in bi-annual calls.

In spite of courses in proposal writing the quality of the proposals is still often quite low. This is probably a reflection of the varying quality of the scientific environments and the access to recent scientific work.

More than 50 % of the total number of students in higher education is enrolled from Maputo city and the majority of PhD-holders are found in Maputo. This is also reflected by the dominance in number of proposals from institutions in Maputo. One way to overcome this imbalance and also increase the quality of proposals is to promote joint applications between institutions outside and within the Maputo area.

The number of FNI research proposals from females is quite limited, an imbalance that has to be dealt with if the resource of female scholars shall not be lost.

Priority Setting – Scientific Quality and Instant Policy Impact

One of the major challenges for FNI is to make priorities in a situation of scarce resources. These challenges include further analysis of: (1) the balance between research, innovation and strategic projects, (2) the role of support to basic research in order to build scientific infrastructure for research capacity and international collaboration, (3) the options for interdisciplinary research initiatives.

We have found a risk that, due to the close policy connection between research priorities and national goals as economic development and poverty reduction, that there is a too high expectation of social and scientific impact of most projects. The stipulated need for fast and applicable outcome of the supported research projects result in a very limited possibility to support fundamental research. The need for applied research and quick implementations is very understandable in the light of poverty reduction. However, in a long term perspective there is also a strong need for fundamental research, which forms the basis for developing the applied research in terms of adopting new knowledge, methods and techniques. Fundamental research is also a part of the strategy of MOSTIS, however, it is not reflected in the guidelines of FNI. The priority on quick results also hampers the development of research and of the researcher, since the results are most often not scientifically good enough to be published in international journals.

In light of the limited resources a mechanism for stimulating a shared use of equipment financed by FNI is of high priority. This could be done e.g. by encouraging a system of user fees. This would stimulate an effective use and also create a basis for maintenance and upgrading of the equipment. The ownership is at the research institutions but instructions from FNI may be guiding the use.

The feedback on the proposals in terms of comments on both approved and not approved proposals is very important for the increase in quality of the proposals. The system for feedback seems however not to work as good as expected and needs to be dealt with. Also the feedback from FNI on the reports of the conducted projects is very important and it is missing today. A system for that is also needed.

There is a good structure at MCT for dissemination of the results from research, innovation and implementation of new techniques, through their regional (CRCT), provincial (NPCT) and district (DPCT) offices. These are used for communication with stakeholders i.e. picking up ideas for research and innovation and communicate the results of research. MCT also organizes an Annual National Science Exhibition in Maputo (one week) and in the regional and province centres. Still things can be better and here we present some recommendations to further improve the dissemination of research results.

It is our observation that the transparency in the distribution and administration of funds is high, but it can also be subject to further development. We have not made any observation that the FNI system has corruption risks.

Indicators and data for an overall evaluation of Science, technology and Innovation in Mozambique for the period 2003 to 2006 have been presented by the Direcção de Plano, Estatística e Cooperação (DPEC)/MCT, in “Livro de Dados 2007, Indicadores de Ciencia, Tecnologia e Inovação” (2009). That work to a large extent covers the need of indicators, however, with complements to those indicators it would also be possible to set goal and target for various steps in the development, and not only to focus on quantitative indicators, but also on qualitative indicators, which is a major challenge in most countries.

The strategic document for science, MOSTIS, presented by the Ministry of Science is a reflection of a good ambition to develop research and build research capacity in Mozambique and the National Research Fund, FNI, fits excellent into that strategy. The impression based on the interviews and documents studied is that FNI and its functions, well lives up to what can be expected from a very young national research funding organization, both in terms of research administration and management of funds. FNI also seems to have a high credibility among the researchers, which is a basis for a successful organization. The overall impression of FNI is thus very positive and there is no doubt that a continued support from Sida is well motivated.

A national research fund, based on a competitive distribution of funds, is a very important tool to develop science and it also forms an excellent channel for international donors. The problems have to be formulated from the needs of the country and this is of course best done by local researchers in cooperation with stakeholders. By supporting national research funds international donors can thus avoid supporting projects not anchored in the needs of Mozambique, which is also a prerequisite for successful implementation of the research results.

Final Recommendations

It is recommended

MCT to:

- an increasing independence of FNI, for which its activities are regulated through instruction (General Rules and Regulations) and an annual letter of regulation focussing both the activity report for the Government/MCT, but also expressing necessary performance indicators.
- in order to meet the great challenges for Mozambique, it might be necessary to qualify and articulate the innovation strategy by focussing on different policy levels and also various models of time-horizons.
- that MCT should reconsider a change of the name of FNI to better reflect its activities e.g. “Fundo Nacional de Investigação e Inovação (FNII)”.

FNI:

- for a full transparency of the FNI function the handbook of FNI is very important. The handbook contains instructions for applications and procedures and obligations for the researcher receiving grants. It shall also include instructions for management of conflicts of interest, rules on gender equity promotion and presented in a PDF-document in Portuguese and in English.
- that apart from funding research projects FNI opens the possibility for support of grants which can be applied for consecutively. This means grants can be applied for to cover the costs for travel (Annual National Science Exhibition, Conferences), conferences fees and publication, which should improve the possibilities for dissemination of the research results.

- FNI should have a further look at the evaluation criteria and especially the scoring model used. It could be beneficial to use such a model, but it is necessary to give a higher weight to scientific quality, if FNI in the long, will promote good science.
- to improve the quality of the research proposals more courses should be run and to address the gender imbalance special courses for female applicants are recommended. The International Foundation for Science (IFS, supported by Sida) has a long experience in this and it would be good if FNI could cooperate with IFS in this matter.
- a bi-annual call for two thematic priority-areas at the time is suggested.
- joint applications between researchers outside and inside the Maputo area in the bi-annual calls for specific priority-areas. Access to a better infrastructure for researchers outside Maputo may also be of help for improving the quality of proposals.
- FNI to focus on gender equity in the grant allocation both as a quality criterion and as an additional dimension of the annual report.
- FNI to announce special annual awards for the female scholar of the year in some scientific fields.
- that a clear policy and mechanisms, instructions to the evaluators and the steering committee is created to promote fundamental research.
- that the possibility of FNI to fund interdisciplinary research is documented and instructions for evaluation presented (e.g. in the FNI-handbook).
- it is recommended that FNI include an instruction for joint use of instruments (e.g. in the FNI-handbook).
- that FNI should make scientific evaluations of the supported research. This can be done after some years, using external reviewers and in steps with a concentration on different research areas.
- FNI is recommended to further develop the model of annual or bi-annual meetings with the research community in Mozambique in order to discuss ways to improve activities and working tools.
- that the ICT-support for FNI will be strengthened and that all projects are made available on the website and that the work procedures, quality criteria etc will be published (the comprehensive FNI-handbook on the net).
- that courses and workshops in scientific writing should be given not only to journalist but also to researchers and teachers at the institutions in how to write popular science.
- that FNI should consider a publication bonus to scholars who have been able to publish their articles in international referee-assessed journals.
- that FNI should continue to develop their own media strategy, in order to cope with the future challenges of communication, public dialogue and implementation of results
- increase the attention to follow and evaluate the implementation process and to develop an evaluation manual, and later on an FNI strategy for analysis and evaluation.

FNI/MCT:

- MCT and FNI to reconsider the need for the Quarterly Reporting Model. One model would be to have financial and administrative reports twice a year, maybe with a start of a quarterly report just as a start up-evaluation.

- MCT and FNI to continue to evaluate the cost and structure of research administration in order to promote efficiency and ICT-use in project administration.
- cooperation with the International Foundation of Science (IFS) to get access to a wider network of Portuguese speaking scholars. In the long run the possibility to write the proposals in English should also be considered. The goal should be to create a pool of external reviewers, as a continuous peer-review back up system. This pool of evaluators may also be used for assessing research coordinated by MCT.
- to put more effort in the development of a combination of quantitative and qualitative indicators.
- MCT and FNI to support a gender equity networks, possible with women scholars from other countries in the region. Such a network does not have to meet physically at many occasions, but could be a combination of few meetings, social media encounters and the use of e-mail.
- MCT and FNI to continue to reflect on the content, connotations and practical use of concepts as basic science, innovation and technology transfer, both from a system perspective and in regard to the local and regional knowledge development process.

Sida:

- to underline the governmental role of a stronger national support to FNI, not only facilities and staff, but also stronger contributions to the grant basis, and finally consider how the pool of resources could be widened.
- to work for a donor harmonisation with respect to FNI, i.e. a memorandum of understanding with Finnida and their support to innovation at FNI.
- to support the fund for research grants.
- to support education to improve the administrative capacity at FNI.
- support initiatives for development of the administrative system at FNI.

1. Introduction

1.1 Mozambique's Great Knowledge Challenge

Mozambique has during the last decade started a development towards a knowledge oriented society with a strong focus on research, technology and innovation. An increasing political stability and economic reforms have supported a high economic growth rate, which forms a basis for investment in research capacity building. The starting conditions for this development comprise a number of institutional, social and economic barriers such as:

- a high level of poverty in the country, although there have been major positive developments the last years
- a generally low level of education in the population in combination with a high level of illiteracy and low level of transition to higher education
- a system of higher education in struggling with problems of quality, efficiency and an unequal distribution over the country
- a university sector that to a very large extent lacks a basic scientific infrastructure and in most parts does not have the capacity to examine students at PhD-level
- a system of research, innovation and technology in an early form of development

Mozambique is a nation with major challenges in regard to social and economic growth and there are needs for institutional reforms in the public sector as well as market regulations. As in many African countries, there is a need to increase foreign investment and open up new markets, to modernise and develop the agricultural sector, the transportation system and the tourism sector. Mozambique has significant assets for future economic growth by the availability of large arable land, water supply and woodland as well as considerable mineral reserves and the increasing potential of the fishing industry as well as the tourism sector.

The tools used by government which has relevance in this context, are and have been:

- The second Poverty Reduction Strategy, PARPA II lasting between 2005 and 2009 with a purpose to increase access to social services and reduce poverty by promoting sustainable growth
- Develop the system of higher education and science and technology through policies by the creation Ministry of Education and Culture (MEC) and Ministry of Science and Technology (MCT) in 2005
- A ten year strategic plan for higher education was implemented in 2000, support the expansion of the system and quality assurance by new quality assurance agencies as National Council of Accreditation and Quality (CNAQ) and National Institute of Distance Education ((INED)
- In 2006, the Council of Ministers approved a new reform strategy for the science and innovation sector by the Mozambique Science, Technology and Innovation Strategy, MOSTIS.
- MOSTIS was seen as a tool to reinforce and integrate objectives and missions of the five year plans, PARPA and Agenda 2025. Key economic sectors to be supported by MOSTIS are; agriculture, energy, water management, construction, fishing, mineral resources, health and education.
- As part of this strategy, a National Research Fund, (FNI) was established in 2005 under the mandate of MCT. The primary mission of FNI is to support scientific knowledge, research, technology inno-

vation and capacity building for both research environments and for researchers in Mozambique. Thereby, FNI has a mission both to contribute to social and economic development in general and to poverty reduction in particular.

- Sida, the World bank and other donors have played central roles in the financial and institutional support for research capacity building in Mozambique, both through FNI and major contributions to the university sector, e.g. UEM

1.2 The Sida Support

The overall aim of Sweden's development cooperation with Mozambique during the strategy period, starting from a rights perspective and the perspective of poor people on development and focusing in particular on women and children, is to reduce absolute poverty by promoting a democratic social development and rapid, sustainable and broad economic growth. The goal is to be reached by means of budget support for poverty reduction, and targeted efforts in three main sectors: democratic governance, agriculture and energy. Furthermore, support will be given to strengthening national research capacity¹.

Sida/SAREC has supported research capacity building in Mozambique for more than 30 years. In 1978 the number of scholars holding a PhD in the country was less than 10, which led Sida/SAREC to support research education for students at the University Eduardo Mondlane (UEM). The program was from the beginning directed at training of individual researchers through sandwich based training and then at a support for building creative environments and research universities with their own postgraduate training programs. However, there is still only one PhD program offered by UEM. Also MSc programs are very few and they only exist in four universities, UEM, the Pedagogic University, the Polytechnic University and the Catholic University.

The sandwich program funded by Sida was run preferentially through Swedish universities in cooperation with UEM and not to leave the students without possibility to do research at their home university the program also included support for building up a research infrastructure at UEM. However, the possibility for scientific development of the trained researcher has been severely hampered by the very limited possibility to finance research in Mozambique. A systematic approach needs to be available in a country in order to promote research. Sida/SAREC therefore supported the Ministry of Science and Technology (MCT) for the development of a strategy and structure for research. This resulted in a strategy document, Mozambique Science, Technology and Innovation (MOSTIS), within which a National Research Fund (FNI) was included as an important tool for development of the capacity of research. For the period 2007–2009 Sida/SAREC provided funds to implement and develop five sub-programs of the strategy document, one of which was the FNI. The five sub-programs are:

- 1 popularising Science, Technology and Innovation;
- 2 establishment of a centre for innovation and applied research in agriculture;
- 3 human resource development;
- 4 indicators for the national STI system
- 5 enhancing the capacity and capability of the National Research Fund, FNI.

According to Sida "All five sub-programs were deemed as crucial for the implementation of the MOSTIS and development of Science, Technology and Innovation culture in Mozambique." For the agreement period 2007–2009 support to the four, (1–4) sub-programs was viewed as one-time support.

¹ Swedish Government Strategy with Mozambique 2008–2012.

Sida is prepared to reconsider a continued support to MCT for a five-year agreement period, 2010–2014 and as a basis for that the FNI, its function for supporting research and management of the funds is here assessed and recommendations for improvements are presented. A condition for a Sida-support is a positive outcome of the assessment of the efficiency and impact of the support from the first period, but also other donors' willingness, i.e. Finland, World Bank, Netherlands, Germany, to support FNI.

The assessment includes the planning and budgeting process, the regulation, mandates of operations as well as documentation. Special attention should be paid on the procedures for selection of activities and research projects to be supported by FNI, how the calls are formulated and disseminated, composition of expert panels, models and administrative routines for grant application etc. Other main areas of focus are on how conflicts of interest are avoided and how the results from the research projects are disseminated among the stakeholders.

The purpose of this assessment, considering the above mentioned background, is thus primarily to make an overview of the MCT/FNI system and especially:

- answer the question whether the Sida funds were handled in accordance with the Agreement.
- make an in-depth assessment of FNI, i.e. its current system of research funds Management.
- identify strengths and weaknesses in the system and provide both Sida and FNI with recommendations on how the system should be improved and further developed.
- finally give Sida recommendations for the future support to the development of research capacity building in Mozambique within the context of MOSTIS , PAPRA and Agenda 2025.

1.3 Terms of Reference

The FNI is a national, independent institution established by and operating under a mandate from the Minister of Science and Technology. The FNI mobilises financial resources from a variety of sources interested in promoting Science, Technology and Innovation (STI) in Mozambique and is responsible for management of research funds, i.e. funding of research projects and dissemination of research results.

During the period 2007–2009 Sida has been in agreement with MCT and funds to FNI were channelled through MCT. In line with Sida's principles on ownership of programs, the MCT is responsible for implementation and for proper administration of funds.

Considering Sida's long-term plans to support FNI as an important institution for the development of STI in Mozambique, there is a need to carry out an in-depth assessment of MCT/FNI, i.e. to assess their potential of using funds for implementation of their strategy for STI and capability to establish appropriate routines and systems for open and competitive management of research funds as well as a system for evaluation and monitoring research quality and research outcomes."

The broader mission of the assessment has been presented above. It is necessary to underline that the assessment is not:

- an evaluation of the scientific quality and the societal and economic impact of the projects being supported by FNI.
- a detailed financial audit checking economic directives, financial transactions and book-keeping.
- a comparative study of the MTC/FNI model in an African or broader international Context.

Rather our assessment can be viewed as a process evaluation and feasibility study looking at the strengths and weaknesses of the MCT/FNI-model. It has also to be kept in mind that FNI in itself has undergone a successive development and progression in a direction of more professional autonomy from MCT, a development that can be labelled as “autonomy within dependence” since FNI may be regarded as a tool to full fill the objectives set by MCT and guidelines from MOSTIS and other policy documents. To sum up, the task commissioned to the evaluators are to:

- make an in-depth assessment of research cooperation with MCT and an institutional assessment of FNI and its management system.
- the period of assessment is from 1 October 2007 to 30 November 2009.

Furthermore, with reference to the terms of reference the following areas have been assessed:

- a in-depth review and assess the planning and budgeting process, the regulation, mandates of operations, documentation
- b procedures for selection of activities and research projects to be supported from Sida funds.
- c the transparency in the distribution and administration of funds and the corruption risks.
- d assessment of how the reporting of results after completed research projects is administrated, disseminated and used.
- e the procedures for recording use, safeguarding and disposal of assets (equipment, tools or other commodities).
- f appropriate measures to prevent management from overriding control mechanisms.
- g provisions for appropriate procedures for avoiding conflict of interest.

The analysis shall include MCT’s organisational and administrative structure and the dimensioning of this structure in relation to its functions, capabilities and duties.

The assignment shall result in recommendations and an action plan in respect of the above-mentioned points. The focus of the assessment shall be organizational structure and its systems and routines for fulfilling its agreed obligations vis-à-vis Sida. In addition to this, the consultant has the right to suggest changes to these Terms of Reference that can be considered to be relevance during the work and can also make recommendations to address any weaknesses identified.

2. Science, Technology and Innovation as a Field of Public Policy

2.1 The STI-challenge in an International Context

Investments in basic and applied research, innovation and technology, to meet future needs are expressed in national strategies in most countries. The knowledge power and competitive capacities of countries and regions are assessed by institutional patterns, resources invested and various forms of performance indicators. One goal discussed within e.g. the European Union is the share of GNP that is used for public and private research. And which division is optimal between financing from public and private sources? Which scientific environments are most creative? Should research best prosper at universities or, are separate research institutes a better way to scientific excellence? And what about the financing instruments and forms of governance, and the models of priority-setting?

There is today a growing interest for thematic programmes and targeted investment to new fields as life science and biomedicine, climate and environment research, modern transport systems etc, but there are also a number of critical voices against this development. Scientists and scholars from various academic fields promote the classic bottom up-model, where the best scientists are competing for resources in a peer-review process based on academic excellence and Science First values. Various methods are used to evaluate scientific excellence; track record of publication in top-referee journals, citation indexes, number of patents and new products, or impact on social and economic development in general.

Thus, the principles and institutional mechanisms utilized in setting priorities for public financing of research and development are crucial aspects of any country's research and innovation system. VINNOVA, the Swedish Innovation Agency, has decided to commission in-depth studies of the prioritization mechanisms in the United States of America (US), China and Japan and in the EU framework programmes in order to welcome open discussions on issues relating to priority-setting and hoping that the studies may also be of interest to other institutions in Sweden and internationally.²

For decades, the US has been the leader of the world in science and still is. The US has undergone a fundamental development with regard to federal funding of research, which was almost invisible or at a very low level after the Second World War, and is not up to almost 70 billion US dollars. The US success in international science standing has a long history and a dynamic mix between public and private investments, driven by academic entrepreneurship, scientific curiosity, but also a growing for using scientific results in technology, community building and everyday life for the citizens. Eliasson (2009) has in a study focussed on priority-setting in science policy in the United States and on describing the US system and clarifying the role of priority-setting in science in the overall successes of US science and competitiveness.

3. MOSTIS and the FNI

“The ubiquitous and equitable availability and use of Science, Technology, Innovation and ICTs as a right of all Mozambicans, in order to accelerate poverty eradication, wealth creation and the improvement of their social well being”.

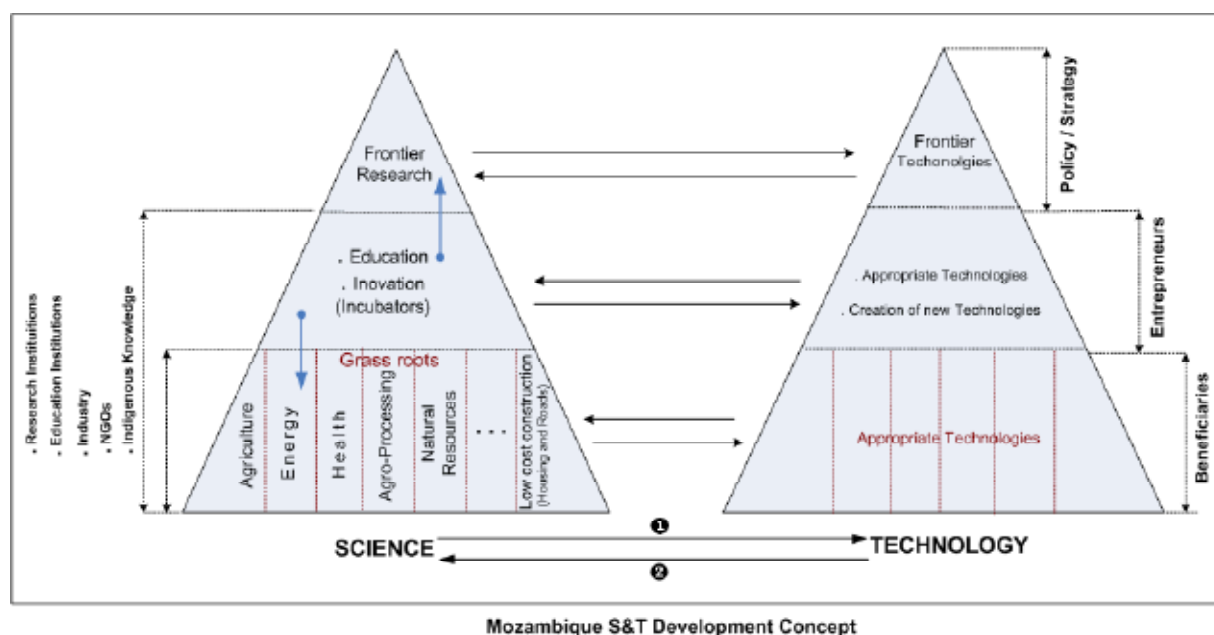
The quote above summarises the vision of Mozambique's Science, Technology and Innovation Strategy (MOSTIS) of 2006. Its fundamental purpose is to “establish an enabling framework, including strategic objectives and programmes, that enables science, technology and innovation (STI) to be harnessed, thereby enhancing their contribution to poverty reduction, to economic growth and to the social wellbeing of Mozambique's citizens.”

MCT is leading the implementation of the strategy formulated in MOSTIS of 2006 and it has three primary roles to play and is responsible for: (a) policy making for science and technology, (b) the performance of all scientific research by the public sector and (c) the coordination of all S&T-related activities within the public sector.

In the strategy document the structure of the different components for the development of research is presented (Fig. 1), where the national Research Fund forms an autonomous body together with e.g. National Council for Science and Technology, Thematic Scientific Councils, National Council for Ethics in Science and Technology, Mozambique Science and Technology Academy. The five Thematic

² See <http://www.vinnova.se/en/Publications/VINNOVA-Analysis/> See also the NORDFORSK network NIRPA, Nordic Network for International Research Policy Analysis looking at policy platforms, financing strategies and outcome indicators at an international level <http://www.vr.se/inenglish/aboutus/internationalcollaboration/nordiccollaboration/norianet/nordicnetworkforinternationalresearchpolicyanalysisnirpa.4.5adac704126af4b4be280005107.html>

Fig. 1 The relation between science and technology (from MOSTIS, 2006)



Scientific Councils has the role of identifying problem areas of high priority and present them to the government, while the task for National Council for Science and Technology is wider in their role as advisors to the government in science, research policy.

For the implementation of the research strategy there are the Scientific Technical Council, the Coordinating Council and the Consultative Council and a number of directorates, directly linked to the MCT. The Council for coordination of research activities coordinates research conducted at the different ministries and in the private sector. This also includes research financed by foreign partners.

MCT is also organized in three regional centers of Science and technology (CRCTs in Nampula, Tete and Gaza) and sub-centers at province (NPCT) and district (NDCT) levels. The idea with these regional and sub-centers is to improve the contact with the stakeholders, picking up problems of priority, promote applied research and to disseminate results of research in strategic areas.

The strategic areas into which Mozambique should focus investments have been defined in MOSTIS as: (1) Human Resource Development, (2) Education, (3) Agriculture, (4) Health, (5) Energy, (6) Marine Science and fishing, (7) Construction, (8) Water, and (9) Mineral resources.

Crosscutting areas include: (1) Social and Human Science and Culture, (2) Gender Equity, (3) Ethno-Botany, (4) HIV/AIDS, (5) Environmental sustainability, (6) ICT and (7) Biotechnology. These strategic areas with applied research and related technologies form the basis for the strategy of Science and Technology, which also incorporate education, innovation and frontier fundamental research.

The FNI is operating under a mandate of MCT, to promote research by offering funding for research on a competitive basis. FNI invites proposals for funding, evaluate them, award funding, monitor and evaluate the results of the funded projects and also fund its own initiative programmes and projects to promote science and technology. Funds are made available for research, research infrastructure, specific Governmental-commissioned research, innovation and technology transfer and development of science and technology.

The calls for proposals are guided by the strategic areas for research as defined by the MCT.

4. The Role of and Contributions from Other Donors

The future development of Mozambique is a concern of many countries and donors. Sida has had a special focus on research capacity building by its support for the formation of FNI and also, and to a much stronger extent, the human resource component by giving grants to the main university, UEM, in order to support the education and research career of students in higher education in Mozambique. An overview (see Appendix 1) shows a broader set of contributions for the development of the public sector as such, e.g. to the sector of higher education, distance education, multimedia support in combination with new ICT-strategies. With regard to the FNI-mission and research and innovation projects, Sweden has been one of the major contributors together with the World Bank, while e.g. Germany and other countries have allocated their support to regional development within a STI and ICT-context.

The World Bank is proposing a new program for strengthening Higher Education, Science and Technology, part of which will be administrated by FNI. The programme (ca 50 mil. US\$) is planned to include grants for BSc, MSc and PhD thesis work administrated by MCT and funds for research projects and innovation administrated by FNI. In the future FNI will have the responsibility also for the thesis grants.

For the coming period (2010- 22 milEu for 5 years) also Finnida is planning to support MCT, with the aim of improving the institutional capacity and infrastructure of the national system of science and innovation (e.g. through FNI), the so called STIFIMO-programme. The support is also directed at the development of infrastructure on regional, provincial and district levels. The focus is on the private sector, rural development and agriculture.

Finnida's new strategy is built on ideas from Finnish Innovation policies with the role of R&D and Technological Innovations as a driving force of economic development and growth. Finland is also highlighting the need for a high-quality infrastructure for ICT as a prerequisite for innovation and change, and, in addition, foster a culture of innovation in Mozambique. Its focus is to strengthen decentralised public institutions and infrastructure and create more efficient STI-services at provincial and district level.

STIFIMO is a comprehensive programme also stressing the promotion of gender equality in science, technology and innovation, as well as entrepreneurship, education and culture constitutes. The STIFIMO governance structure include a Supervisory Board, Steering Committee for strategic decision making and a Management Team for day to day programme management, a National Programme Coordinator and five international long-term experts, two at senior and three junior level.

5 The Assessment of the National Research Fund, FNI: Findings

Data were collected through interviews, reading of documents and site visits of research projects funded by FNI. The interviews included staff from MCT, FNI, evaluators, the steering committee, and scholars funded and not funded by FNI.

Issues to deal with for the assessment of FNI and examples of related specific questions that were addressed are found in Appendix 2.

5.1 The Calls and Proposals

So far there have been two calls for proposals from FNI, which means the experience from the system is limited.

The calls were announced in national papers, on the home page of FNI and in special announcements at the university departments. The first call (2006) resulted in 42 proposals submitted to the FNI. Of these 18 were rejected for not meeting the guideline and priorities of FNI: i.e. (1) projects should be within the priority areas and foresee quick results; (2) Good impact in rural communities and poverty reduction; (3) Appropriate execution period; (4) budget adequacy; (5) eligibility of applicants. The rest of the proposals, 24, were sent to external reviewers for evaluation. 17 of these proposals were funded (ca 40 %), of which 12 projects were in research and 5 in innovation and transfer of technology. Projects in agriculture were the most frequent (ca 57 %) followed by health (ca 17 %) and education related projects (ca 14 %). Agriculture was also dominating in the approved projects (ca 50 %) followed by health (ca 33 %), i.e. rather much reflecting the number of the submitted proposals from the different areas. The majority of approved proposals were submitted from institutions in Maputo.

As a result of the second call (2008) 115 project proposals were submitted and 28 of the proposals were approved for funding (ca 24 %; 800 000 U\$), of which 17 projects were in research and 11 in innovation and technology transfer. Agriculture (41 %) and health (23.5 %) were also in this second call dominating the approved projects followed by fishery, natural resources and sociology (each ca 12 %).

The maximum sum approved for funding was 50 000 U\$ for the two calls.

In 2008 a separate call for strategic projects were announced and it resulted in submission of 88 proposals. These projects were generally directed at technical development, transfer and implementation of technology and 16 projects (ca 18 %) were approved.

The length of the project was in these first calls approved for 9 months the reason for the short time limit of the projects was an expected assessment of the FNI, hence, short term results were judged necessary. The proposals are very much directed at applied research and they often have the character of implementation of knowledge, rather than creating new knowledge.

Apart from the Sida supported research FNI in cooperation with the national Research Fund of South Africa (NRF), participates in joint calls for research within the areas of Biosciences, Space science, mathematics, energy, environment and traditional, local knowledge. Participants from both countries are compulsory in the proposals. This program is financed by the Mozambique national research fund (100 000 U\$) and South African NRF funds (100 000 U\$) and the South African funds are expected to increase (to 130 000 U\$). To this call 27 proposals were submitted and 4 of them were approved (ca 15 %).

The administrative resources are today regarded too limited for calls to be announced every year. It has therefore been suggested by FNI to take place every second year.

5.2 Evaluation of the Proposals

The proposals are all evaluated by scholars well acquainted in respective research fields. The evaluator is paid 50 U\$/evaluation.

The proposals are written in Portuguese, which means the evaluators were selected from scholars in Mozambique. The evaluations are sent to a steering committee, which has five members with one representative each from: a research institution, an institution of higher education, the Ministry of Science and Technology (MCT), a regional Centre of Science and Technology (CRCT) and FNI. The steering committee makes a suggestion of which proposals to be funded and the final decision is taken by MCT.

The selection of proposals was based primarily on the quality (50 % of the weighted grade) of the proposal, followed by the research capacity (25 %) of the applicants, the social-economic benefit of the project (10 %), the significance for the problems of the country (10 %) and relevance to the priority areas (5 %). The ambition of the steering committee was to have all areas of priority represented in the approved projects, as well as institutions from geographically wide areas of the country and a gender balance, but there are no criteria or instructions for that. The quality of the proposals always had to be of good quality to be approved.

For project related to innovation the selection criteria were different. For those proposals the social-economic, science, technology and environmental impact has the highest weight (30 %), followed by results and expected effects (25 %), relevance for Governmental objectives (20 %), general quality of the project (15 %) and integration with strategic science and technology priority areas (10 %).

5.3 Management and Financial Transactions

The general regulation of FNI objectives, its funding activities and management system is expressed in the official document of the National Research Fund (FNI) - General Rules and Regulations for Funding Activities, which is approved by MCT. It is an important document providing a formal basis for the work and progress of FNI. The task of financial management is described in detail in an Annex to the Rules and Regulations-document, Guidelines on Financial Management of the National Research Fund supported project.

These guidelines are providing a financial and administrative model for the allocation of resources for research and innovation granted by the FNI from MCT to FNI and from FNI to Lead Institution at university or institute level and finally to the project and the project leader. The Financial Management Guidelines document comprise recommendations of the project budget, the flow of funds from MCT to FNI and the role of bank accounts, and finally, the transfer of fund from FNI to Lead Institutions, and finally to the projects.

The funds are transferred from MCT to FNI in US \$ and in Meticaís on a quarterly basis and FNI opens two bank accounts. The principal signatory to the account is the Executive Director and one of two other signatories. Each project will, according to this financial management procedure, open a separate bank account and report back to FNI on a quarterly basis.

The guidelines also contain specific regulations of the use of accounting books and the role of accurate documentation of the financial transactions, eligible expenditures, role of procurement to limit costs, the responsibility of the Lead Institution for the financial management and control of economic transactions. In addition, it includes regulates how to prepare a Quarterly Progress Report and a Quarterly Financial Statement for each project being supported and submit these to the FNI within 15 days after the end of each quarter. The administration board then meet during the next two weeks, to review the reports and endorse or reject further financial support. In addition, FNI have to submit a Quarterly Financial Statement to MCT, indicating how funds have been transferred to the lead institutions.

Financial monitoring is the duty of the FNI Financial Controller, who also gives information and guidelines to projects on accounting books, bank transactions and other financial documentation. The whole FNI financial management process, accounting and monitoring is scrutinized by an independent external auditor and an annual audit report of the National Research Council is completed not later than three months from the end of the financial year. Part of the audit could also be carried out at Lead institution level, especially when they are carrying many projects.

6 Lesson Learned and Recommendations

6.1 What is an Innovation and what does it mean for Mozambique?

MOSTIS uses the concept of innovation in a broad sense, almost like a model for national transformation, learning and entrepreneurship:

“A culture of innovation must be nurtured amongst Mozambican society at all levels, which instils an entrepreneurial attitude for dealing with both social and economic challenges alike. In particular, those caught in poverty must be enabled to address their challenges using relevant, science-based knowledge and approaches that exploit their inherent ability to develop innovative solutions”.

OECD defines an innovation as³:

“Innovation activities are all scientific, technological, organisational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Some innovation activities are themselves innovative; others are not novel activities but are necessary for the implementation of innovations. Innovation activities also include research and development that is not directly related to the development of a specific innovation”.

Within this definition, four forms of innovations are mentioned: *product innovation; process innovation; marketing innovation and organisational innovation.*

On a more general level, it is possible to talk about three forms of innovation systems; national systems, sector-based systems and regional systems. An innovation system approach, can, from a VINNOVA viewpoint be seen as a “general analytical framework for analysing the role, impact and relationships of all factors that are important in generating innovation and in transforming innovation into economic value. In this study an innovation system is defined as: *The network of organisations, individuals and institutions which determine and shape the generation, diffusion and use of technology and other knowledge, which, in turn, explain the pattern, pace and rate of innovation and the economic success of innovation.*

The long-term international competitiveness and development of MOSTIS as a national innovation system is, as stated in the strategy depending on the scarcity of resources demands that science and technology activities, especially those that are directed to areas and sectors with the largest potential impact (direct and indirect) on poverty reduction, wealth creation and improvement of social wellbeing. The various political programmes and agendas, including the major elevation of the pool of persons with higher education degree or academic performance at doctoral or post-doctoral level, are major challenges for the future of Mozambique.

An interesting issue in this future oriented context is the vital role of user-involvement at regional, provincial and local level, with regard to the promotion of a culture of innovation. It is possible to apply various forms of user-involvement in science and technology.

Traditionally, research is taking place on a certain phenomenon (or sometimes “above” the phenomenon). Independent, critical and curiosity-driven research often has the role of trying to understand and explain new phenomenon, which might not have an obvious or direct significance to the public. Scientists in e.g. geophysics are not so often top-runner in media domination, but, as we have recently, seen, when their research has an impact on the total air-transport system in Europe, and elsewhere, they are moving into the core of public and political relevance.

³ OECD, 2005, “The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual, Third Edition” prepared by the Working Party of National Experts on Scientific and Technology Indicators, OECD, Paris, para. 149

Another role is to do research for a special field, an area, or a thematic issue or topic. Public health research, on an international level, can have tremendous impact on the well-being of people, but it is not, in many cases necessary with continuous user involvement at all levels of research. It is also possible to do research and promote innovations with a constituency or, that they are doing there own research. Thus, the role of seeing innovations and changes in technology, structures and behaviour, in close co-operation with end-users is an important part of the MOSTIS development strategy.

6.1.1 Recommendation

We recommend, MCT and FNI to continue to reflect on the content, connotations and practical use of the word innovation. Our observation is that innovation and invention, sometimes is used almost as synonyms. It is also necessary to make distinctions between the word innovation and development and between innovation and social change. Many of the challenges that Mozambique are meeting in the future, do not always have to be met by new innovations or research. In many cases, it seems more efficient to disseminate and implement “best practice-models” or new forms of community involvement or adult learning.

Poverty-reduction is a core concept in MOSTIS and it is also a basic value in the Sida development strategy. In order to meet the great challenges for Mozambique, it might be necessary to qualify and articulate the innovation strategy by focussing on different policy levels and also various models of time-horizons. All international experience of science-building underlines that the results and impacts emerge over a period of many years.

6.2 General Comments and Recommendations

The function of FNI, (i.e. financing research, innovation, development of technology and adding values to already presented knowledge and implementation of research/technology) is not reflected in the name and may call for another name of the institution. In other countries these functions are divided between different institutions and to have a name better reflecting the function of FNI the name could be e.g. “Fundo Nacional de Investigação e Inovação (FNII)”. This is further motivated by the planned support from Finnida, a support which is strongly focused at development of the Innovation system in Mozambique

MCT has the responsibility for coordinating the research efforts in the country. Only a part of the research in Mozambique is conducted through FNI. Through governmental funds and donations etc research is also conducted at the different ministries e.g. the Ministry of Fishing, Ministry of Health etc. It is not clear how the quality of the research at the ministries is assessed and here FNI, with a better developed and broad evaluation network, may serve as a basis for assuring a high quality of research.

It is important to make a distinction between the governing structure and mandate of MCT/FNI and the process of operations. Taking into consideration, that the FNI is a relatively new organization, it is understandable that FNI operations are taking place in close cooperation with MCT and also that the Ministry makes the final decision on project approvals suggested by the steering committee. In the long run, however, we recommended an increasing FNI independence and that its activities are regulated through its instruction and an annual letter of regulation.

The strong economic and strategic involvement of Finnida in the STIFIMO-programme also raises issues of donor harmonisation and process-synergies, especially with the Sida investment and World Bank-support. The Finnish mission is to introduce and foster a culture of innovation in Mozambique, strengthen the ICT-infrastructure, to reach out in a decentralised context and, last but not least, to open up for private sources of financial support. Thus, the STIFIMO-programme also highlights the main objectives, institutional setting and functions of FNI, both in a short and long run.

The capacity of FNI will certainly increase when dealing with the innovation policies and implementation, but it is also a big challenge of organisational learning and development, not to forget the long-term mission of increasing need for self-management and control from a Mozambique horizon. More functionally, the STIFIMO-programme provides an excellent opportunity for donor collaboration under a more general STI-umbrella. In this context Sida could have a stronger priority to build general research capacity, both for basic and applied research, by increasing the option to apply for research grants in a new portfolio of various forms of grant-support, while Finnida takes the responsibility for the promotion of an innovation culture, that is growing in a public-private partnership.

Finally, both Sida and Finnida, can, in collaboration with World Bank and other donors support a system of continuous self-evaluation and improvements of institutional arrangements, steering and management models as well impact and implementation studies.

6.3 The Calls for Research Proposals

The outreach of calls seems satisfactory. However, with a more secure funding of FNI it may be expected that the calls are announced repeatedly at a specific time of the year, which means the researcher will always know when the calls can be expected.

The percent of approved projects in the latest call, 24 %, is sound and indicates that there has been enough number of proposals for a competition and selection for good quality. However, there is still a need for increasing the quality of the proposals.

More than 50 % of the total number of students in higher education is enrolled from Maputo city and the majority of PhD-holders are found in Maputo. This is also reflected by the dominance in number of proposals from institutions in Maputo. Special actions have to be taken to increase the number of proposals from institutions outside Maputo. FNI may serve as one tool for that.

Agriculture and to some extent health are the dominating research topics of the proposals. This only to some extent covers the strategic areas defined in MOSTIS and mechanisms to stimulate research in the other strategic areas may be necessary.

The nine months in the first call is far too short for a project to be fruitful and the planned time of two year projects is much more appropriate.

Proposals directed at fundamental research are sparse, even though fundamental research is a part of the strategy for research.

Laboratory and field equipment can be funded by FNI. The ownership of the instruments belongs to the research institution and the use of the instruments is regulated by the institution.

6.3.1 Recommendations

For a full transparency of the FNI function a Manual/handbook of instructions is presented in the MCT website intended for researchers applying for grants and for the evaluators. The handbook contains instructions for applications and procedures and obligations for the researcher receiving grants. However, it should also include instructions for management of conflicts of interest, clear guidelines for the evaluators and the steering committee and a description of the evaluation process (see e.g. The Swedish Research Council for Environment, Agricultural Science and Spatial Planning (FORMAS's handbook 2009)).

Apart from funding research projects it is also recommended that FNI opens the possibility for support of grants which can be applied for continuously. This means grants can be applied for to cover the costs for travel, conferences and publication, which should improve the possibilities for dissemination of the research results.

To improve the quality of the research proposals more courses should be run. The International Foundation for Science (IFS, supported by Sida) has a long experience in this and it would be good if FNI could cooperate with IFS in this matter.

Better feedback on the proposals in terms of comments on both approved and not approved proposals is very important for the increase in quality of the proposals.

A feedback from FNI on the reports of the conducted projects is also very important and this is missing today.

To increase the number of proposals from the institutions outside Maputo and promote scientific development in the whole country, calls for joint applications may be a tool. This would not only promote an increase the quality of the proposals, but also give scholars outside Maputo an input to collaboration and access to laboratory and other infrastructure missing at their home institution.

A mechanism for stimulating a sheared use of equipment financed by FNI is of high priority. This could be done e.g. by encouraging a system of user fees. This would stimulate an effective use and also create a basis for maintenance and upgrading of the equipment.

To stimulate the scientific development of all priority areas calls directed at two specific areas of priority may be announced every second year. These calls may combine the need for development of scientific areas with the need for larger number of high quality proposals from institutions outside Maputo. I.e. calls for joint applications in selected areas with researchers from both Maputo and institutions outside Maputo.

The stipulated need for fast and applicable outcome of the supported research projects result in a very limited possibility to support fundamental research. The need for applied research and quick implementations is very understandable in the light of poverty reduction. However, in a long term perspective there is also a strong need for fundamental research, which forms the basis for developing the applied research in terms of adopting new knowledge, methods and techniques. Fundamental research is also a part of the strategy of MOSTIS, however, it is not reflected in the guidelines and proposal evaluation criteria of FNI. The priority on quick results also hampers the development of research and of the researcher, since the results are most often not scientifically good enough to be published in international journals. A clear policy and mechanisms, instructions to the evaluators and the steering committee, has to be created to solve this!

6.4 Evaluation of Proposals

The steering committee is well aware of the problem that the projects are often not creating new knowledge, but they are more like development or implementation of research results. Some evaluators comment on the poor quality of the proposals, especially those proposals coming from outside Maputo.

The poor quality of many of the research proposals may be a reflection of the low proportion of researchers holding a PhD (In 2005 only ca 30 of the 300 full-time researchers had obtained a PhD in their area of research (World bank-report)).

Applications from researchers outside Maputo are often very poor, however, after courses in proposal writing there was a slight improvement. There are few female researchers applying for project support.

The evaluators are instructed to write comments on the proposals. Still the applicants do not feel they get a good feed back. So far, only the approved proposals get comments for eventual improvements on the projects.

A written feedback on all proposals, not only those approved, is highly wanted.

Since the number of scholars in each research area is quite limited, it may be a problem to avoid conflicts of interest.

The criteria for evaluation are not formulated for possible support to fundamental research (or deeper research). The strategic document mentions fundamental research, but yet there are no resources for support, should perhaps be done in collaboration with external partners.

There are no specific tools at FNI to handle interdisciplinary research proposals, which may be promoted for solving complicated research problems. However, when doing so each contributing discipline has to be evaluated with reference to depth and quality of research and their role in the project has also to be clear.

6.4.1 Recommendations

Instructions for handling conflicts of interest should be presented in a document (e.g. in a FNI-handbook). Such a document, explaining the meaning of conflict of interest, should also be signed by the evaluators.

The possibility of FNI to fund interdisciplinary research should be documented and instructions for evaluation presented (e.g. in the FNI-handbook).

Since the proposals are written in Portuguese the number of possible evaluators is limited. To widen the base of evaluators, thereby minimizing the conflict of interest and also to get influences from scholars outside Mozambique, the network of the International Foundation of Science (IFS) could be used for evaluators in Brazil and Portugal. Apart from this English classes for scholars are important for a future possibility of submitting the proposals in English and to increase the contacts with the international science community and further widen the base of evaluators.

For the improvement of proposal writing a cooperation with IFS, which has long experience in this matter, is also recommended. With reference to the low quality of many of the proposals a thorough feedback from the evaluators needs to be stressed by FNI, and not only on those proposals which are funded.

After finishing the projects reports on the research results are sent to FNI. It is important and recommended that FNI create a structure for reacting on and absorbing important results for special dissemination.

FNI should make scientific evaluations of the supported research. This can be done after some years and then with a concentration on different research areas.

FNI is recommended to organise annual or bi-annual meetings with the research community in Mozambique in order to discuss ways to improve activities and working tools.

6.5 Management and Financial Transactions

From a formal and regulatory point of view, the system of financial management seems to be well established, carefully monitored and also under the supervision of independent external auditor. One argument for the chosen form of financial management is, of course, the need to control that the grants and money are used in accordance with the goals, to avoid over-spending or provide a safeguard against illegitimate use of public resources. Considering these contextual factors and the current level of infrastructure for the allocation of public funds, we also understand the need for a regulatory, or sometimes, over-regulatory model. At the same time, it is quite evident, that the model of quarterly reports in both directions creates a lot of administrative routines and administrative work that has to be compared with other needs of FNI-management work, such as the promotion of a culture of scientific exploration, the focus on criteria of scientific excellence, user-involvement and public relevance aspects.

The time cycle from the call to the release of funds is generally acceptable, however, there is sometimes also a delay in releasing the funds, which, especially for project in Agriculture, is a big problem due to annual change in weather etc.

6.5.1 Recommendations

We recommend MCT and FNI to reconsider the need for the Quarterly Reporting Model, which also is influenced by the short project period as such. In another part of our report, we highlight the needs to both promote longer project periods and also, to give more attention to basic or fundamental sciences. One model would be to have financial and administrative reports twice a year for project lasting more than 12 months, maybe with a start of a quarterly report just as a start up-evaluation. Another disadvantage with the quarterly-report system is that you are building in a delaying mechanism in the flow of transactions, which might have a negative impact on the quality and conditions for the research work as such. An innovation system built on too high expectations of direct-use and social impact, could, in the long run be counter-productive. Thus, it is concluded that basic research is needed to build an environment of creative, scientific and long term-oriented research, and Mozambique needs a number of structural innovations, based on science and technology, to meet better use of national assets and contribute to the future prosperity of the country.

6.6 Gender Equity as a Field of Priority

The number of FNI research proposals from females is quite limited, an imbalance that has to be dealt with if the resource of female scholars shall not be lost. In most countries, gender equity is a big problem in all parts of scientific work, at universities and other institutions of higher learning. The level of gender equity in research is, of course, a mirror of the level of gender equity in education in general and in higher education in particular. Gender equity is also contextually based in various fields of science and technology, medicine, social science and humanities. Thus, gender equity in science is a major challenge also for MCT and FNI, which to some extent is also expressed in MOSTIS. There are various policies and instrument that can be used in order to promote gender equity for MCT and FNI.

6.6.1 Recommendations

The general rules and regulations for FNI should clearly include gender equity as a goal not only for society, but also for the scientific community. Furthermore, FNI should focus on gender equity in the grant allocation both as a quality criterion and as an additional dimension of the annual report.

Other tools that can be used are support of gender equity are networks, possible with women scholars from other countries in the region. Such a network does not have to meet physically at many occasions, but could be a combination of few meetings, social media encounters and the use of e-mail. Another possibility would be to have special annual awards for the female scholar of the year in some scientific fields, which could be eligible for young scholars with excellent track record and future potentiality. With two or three such positions per year, it would be possible to create a team of future leaders of research in Mozambique, who could function as models and ambassadors of for gender equity and research in Mozambique.

6.7 Dissemination of Research Results

There is a structure at MCT for dissemination of the results from research, innovation and implementation of new techniques, through there regional (CRCT), provincial (NPCT) and district (DPCT) offices. These are used for communication with stakeholders i.e. picking up ideas for research and innovation and communicate the results of research.

MCT also organizes an Annual National Science Exhibition in Maputo (one week) and in the regional and province centres. These exhibitions form an arena for or students, researchers, private companies

and other stakeholders to meet and exchange information. Here research results are presented and the need for new research can be presented.

FNI and MCT also organize Annual Science & Technology Meetings. Its purpose is to share experience, discuss papers and disseminate new knowledge to scholars, practitioners and persons working at the policy level in the fields of science and technology. Furthermore, FNI organizes Annual National Seminars for the dissemination of projects results and its impacts. These initiatives can also be seen as efforts on scientific and technology literacy, e.g. the challenges met in every country to broaden and deepen the understanding of scientific and technological knowledge.

To make scientific results public there also are links to the papers/journals in Mozambique with special journalists for science in the papers. There are also courses in science for journalists to improve their access to science. MCT has also established very ambitious plans for a “Science Park” to be established in the Maputo areas. If successful this will have a significant impact on the communication of science and exchange between scientists and the private sector.

6.7.1 Recommendations

Courses in scientific writing should be given not only to journalist but also to researchers and teachers at the institutions in how to write popular science.

FNI may allocate funds for travel support for researchers to attend the Annual Science Exhibitions.

We also recommend to FNI strengthen the communication of research with community, NGOs and adult education at regional or local level. That can be done e.g. through study circles, community-based discussion groups or so called research circles, where a researcher is coaching “science-learning and research-implementation” of a local constituency. ICT plays a core function in this context, but networks, social media and person-to-person contacts are as important.

We recommend FNI to start a process defining its own information and media strategy, that both highlights to role of scientific publishing, but also popular communication and media contacts.

6.8 International Collaboration

Mozambique has a limited budget for research and can therefore not cover all research areas with a high quality research. One way to overcome this problem is through international cooperation. Apart from the cooperation with South Africa, with joint proposal research funding in specific research areas, Mozambique has an exchange program with Tanzania. However, there seems to be no other bilateral agreements.

6.8.1 Recommendations

One way to share the costs for research would be to expand the bilateral agreements and create research hubs with mutual access to the facilities. Another option could be the creation of a “Southern Africa Research Council”, which could attract international donors.

6.9 Evaluation, Institutional Design and Performance Indicators

The development evaluation can be seen as both a scientific field and a policy field in itself. It is, of course, not possible or necessary to review this large bank of knowledge within our restricted task. The Sida Evaluation Manual: *Looking Back, Moving Forward* from 2006, provides a sound basis for evaluation. It stresses evaluation as a learning process, an incentive for further development:

Evaluation, as we use the term, is first and foremost a reality test, a learning mechanism that provides feedback on the results of action in relation to prior objectives, plans, expectations or standards of performance

Important quality criteria for development evaluation are, according to Sida: effectiveness, impact, relevance, sustainability and efficiency. Other forms of evaluation guidance are provided by the OECD DAC-network on Development Evaluation.⁴ An evaluation can assess the process to reach certain goals, but also the impact of the intervention chosen. This in-depth study of MCT/FNI is mainly a process evaluation, but it is also important to design criteria and methods to study the impact of various measures.

The MCT and Mozambique Government's plan for future development of the STI-sector within the assessment of Sida support comprises four dimensions: i/ Funding of research through FNI, ii/ Human resource development iii/ Strengthening research-related institutions and linkages, and iv/ Popularisation of science and technology.

In the MCT/FNI project plan, the following indicators have been spelled out:

- Number of citations of Mozambican research
- Number of collaborative and multidisciplinary research projects
- Number of research projects with results having been used practically in Mozambique
- Number of Technologies adapted and adsorbed
- Number and range of research projects
- Amount of funding disbursed

Indicators and data for evaluations of Science, technology and Innovation in Mozambique for the period 2003 to 2006 have been presented by the Direção de Plano, Estatística e Cooperação (DPEC)/ MCT, in “Livro de Dados 2007, Indicadores de Ciencia, Tecnologia e Inovação” (2009). That work to a large extent covers the list of indicators mentioned above and more than so. Data are presented on:

- financial resources
- human resources
- gender
- information and communication technology
- publication of research
- transfer of technology and innovation

and it forms a very good basis for evaluations.

As complement to those indicators it would also be possible to set goal and target for various steps in this development, as a complement to projecting the realities within one or two decades? With indicators like:

- Number of improved processes implemented
- Number of new linkages established
- Number of research projects completed that have results aligned with national priorities

⁴ See http://www.oecd.org/site/0,3407,en_21571361_34047972_1_1_1_1_1,00.html The DAC document Evaluating Development Co-operation. Summary of Key Norms and Standards shares the five criteria above, and provides further support for the evaluation process.

- Number of people informed of research results
- Regular reports available analysing the performance of the STI system

Finally, the popularisation of science and technology, can be described both in quantitative and qualitative methods. MCT and FNI have been successful in arranging events, exhibitions and public event and also increasing media coverage. All these initiatives are valuable and show the entrepreneurial spirit of the driving forces in the implementation of MOSTIS, but indicators of local and regional community development and of joint knowledge building between scientists, policy people and the local constituency may be strengthened.

The role of popularisation of science and technology, may be estimated through measures of:

- Number of participants at Festival
- Number of provinces with Fairs
- Number of participants at the Fairs
- Number of provinces with Science Olympiads and technology competitions
- Number of programmes adapted and broadcast

It is not an easy task to design criteria to evaluate a research council in its beginning and successive organisational transformation. One criterion, that is not mentioned below is the transaction cost for research financing. In Sweden, this figure is usually 8–10 % of the total budget for research investments. One target for FNI, thus, is to develop an efficient organisation, to reduce overload of administration and focus on scientific values and innovation cultures.

All of these indicators are valuable measures of the development of the STI-sector in Mozambique and most of them covered in the “Livro de dados.....”(2009), but it is necessary not only to focus on quantitative indicators, but also on qualitative indicators, which is a major challenge in most countries.

The same argument can be used for the human resource development challenge. Most indicators used in that context are of quantitative character. At the same time, the quality of higher education in Mozambique varies and in an international comparison it is in many cases of low level. Thus, what is needed is the development of indicators of increasing quality in higher education in Mozambique.

6.9.1 Recommendations

We recommend MCT and FNI to: put more effort in the development of a combination of quantitative and qualitative indicators; increase the attention to follow and evaluate the implementation process and to develop an evaluation manual, and later on an FNI strategy for analysis and evaluation.

7 Concluding Comments

The strategic document for science, MOSTIS, presented by the Ministry of Science and Technology is a reflection of a good ambition to develop research and build research capacity in Mozambique and the National Research Fund, FNI, fits excellent into that strategy. The impression based on the interviews and documents studied is that FNI and its functions, well lives up to what can be expected from a very young national research funding organization, both in terms of research administration and management of funds. FNI also seems to have a high credibility among the researchers, which is a basis

for a successful organization. However, there are always room for improvements and here a number of recommendations have been presented.

A national research fund, based on a competitive distribution of funds, is a very important tool to develop science and it also forms an excellent channel for international donors. The problems have to be formulated from the needs of the country and this is of course best done by local researchers in cooperation with stakeholders. By supporting national research funds international donors can thus avoid supporting projects not anchored in the needs of Mozambique, which is also a prerequisite for successful implementation of the research results.

The overall impression of FNI is thus very positive and there is no doubt that a continued support from Sida is well motivated.

It is recommended Sida to (1) underline the governmental role of a stronger national support to FNI, not only facilities and staff, but also stronger contributions to the grant basis, and finally consider how the pool of resources could be widened, (2) to work for a donor harmonisation with respect to FNI, i.e. a memorandum of understanding with Finnida and their support to innovation at FNI, (3) to support the FNI fund for research grants, (4) to support education for improving the administrative capacity at FNI (5) to support initiatives for development of the administrative system at FNI.

Appendix 1. International Donor Projects

	Funding partner	Project title	Dates	Budget ('000 US\$)
1	UNDP	ICT for Development Programmes	Sept 2002 to Dec 2006	1 117
2	DANIDA	Public sector reform	Jan 2003 to Jan 2006	12 000
3	DANIDA	Fundo de Investigação sobre a pobreza	Aug 2003 to Sept 2007	600
4	Ford Foundation	Support for the development of strategic elements of the national S&T system	Jan 2004 to Jan 2008	500
5	UNESCO Suíça-SDC	Initiative to expand the multimedia community centres	Nov 2004 To Nov /2006	715
6	SIDA/SAREC	Support for establishing the national S&T system	Sept 2005 to Aug 2006	328
7	International Development Research Centre (IDRC)	Design Phase of Strategic Plan of Science and Technology	Sept 2005 to Mar 2006	44
8	UNDP/Microsoft	Establishment of Digital Resources centre in Gaza Province	Feb 2006 to Jan 2008	81
9	International Development Association (WB)	Credit to Higher Education	March 2006 to May 2007	47
10	World Bank	Funding for research	May 2006 to Dec 2007	936
11	UNDP/Finland	Assistance for Minister of MCT in ICT	June 2006 to May 2010	1 082
12	Japan	Human Resource Development in ICTs	Nov 2006 to Oct 2009	300
13	International Development Association (WB)	Development of STI aimed at economic growth and reduction of absolute poverty	Oct 2007 to Sept 2009	3 400
14	Germany	Development of STI for rural communities	2007 (one year)	2 900

Appendix 2. Questions Addressed in Interviews and in the Study of Documents

General objectives, formal mandate and policies

- How the relation between MCT and FNI is formally regulated? Is there a basic instruction for FNI for a longer period and annually letters of regulation? Describe the legal basis? Who has the mandate to decide on the profile of FNI.-budget? How are the MOSTIS-priorities reflected in the FNI-work? Which thematic priorities can FNI do? Is the bottom-up model with open competition between applications the best way to organise FNI-activities? Would it be possible to have annual calls in a combination of general and open calls year 1, followed by a thematic call year 2, and the general and open call the third year in order to combine open and thematic calls?
- Describe the priorities between basic science, applied research as well as innovations and implementation? Is there any ambitions to stimulate inter-disciplinary research?
- What are the relations between basic science as well as social science and humanities and applied and needs-oriented research?
- Which is the place and space for user-involvement and local community-actions with regard to the formulation of problems/needs/priorities?
- Is there a possible support for collaboration between universities with regard to infrastructure, equipment and technical support? Joint use of labs, libraries, media centres within and between universities and research institutes?
- The big majority of research takes place at UEM. What support has been directed to other parts of the country e.g. Nampula (11 % of students) or Sofala (9 %)?

Announcement of calls and assessment of applications

- How are the grants from FNI announced? Information campaign, newsletter, advertisements etc. How transparent is the FNI-system? Are the calls thematically oriented? Is there information on the website not only on the calls but also on the organisation of the selection process (composition of steering committee, time for final decision, time for project start and financial allocations)?
- Is there any training or “search-conference” or other support for new applicants? Which is the language for the application? Will applications in English be accepted?
- What are the current support forms and the process of project selection – are all applications being sent to external reviewers (or only “the best”)? How does the steering committee deal with the external assessments – could they be overruled?
- What is the role of geographical distribution of support? What priorities are made between scientific quality, thematic field as well as gender policies? What is the role of the size of the project – and the need for infrastructure and equipment? Has FNI had a discussion on the need to broaden the grant-support forms (such as post doc support, network support, publication bonus support?)
- How are the external reviewers chosen? National or international? How can the recruitment of scientifically competent reviewers be expanded? How does FNI deal with conflict of interest? Is there special written policy in order to avoid conflict of interest? Is FNI meeting a high level of trust and respect in the research community?

Follow up of decision, staff development, ICT and information policies

- How are the decisions from FNI communicated to grant applicants? Are there various forms of feedback both to applicants being supported and to those being rejected? Will there be any feedback to the external reviewers on the decision taken by FNI?

- Does FNI have a plan of staff-development and skill formation supporting its own activities? Is there a recruitment policy?
- Does FNI have any plans to enhance the ICT-support in the grant application/ assessment process? Which attention is given to evaluation and performance indicators at FNI?
- Assessment of how the reporting of results after completed research projects is administrated, disseminated and used. Is there any form of quality assessment of the results?
- Which channels are used for scientific and public communication? Special meetings between researchers and stakeholders? House of Technology? Science Festivals? Publication policies and publication support? Role of popularisation? Journals and media contacts?
- How is the FNI-information and dissemination strategy being developed today and which plans are for the years to come? Role of meetings, conferences, new media etc as well as traditional forms as study circles and local groups.
- Does FNI have an internationalisation policy? Mozambique is a country with limited resources and it cannot be excellent in all fields. What is the role of regional co-operation? The role of academic clusters, not only for enterprise.

Financial matters, allocation of resources and auditing

- How is the Sida-support being channelled from MCT to FNI and to the universities and researchers? Which financial instruments are used? What kind of auditing systems are in practice? The division of responsibilities between MCT/FNI and the universities.
- Which are the policies for expanding the financial base? How is FNI-supported research related to research financing from other international sources or from the business sector? Is there a risk with an increased financial support from business and private interests? Options of matching funds and cross-sectoral collaboration? Are there other relevant questions concerning FNI (e.g. regional or international networking, external co-operation etc) not covered above?
- Are there other international donors or plans for international donors to support FNI?
- How could financial transparency be improved? What is the balance between management costs, administrative costs and direct research investments? Furthermore, principles of selection of proposals are of interest; especially if there is a separation between the assessment process and the decision process. Which control mechanisms are used in the financial management process between different levels in the system? Is a part of the Sida-grant used as administrative cost?
- What are the procedures for recording use, safeguarding and disposal of assets (equipment, tools or other commodities)? The main issue here is to what extent an infrastructure for research can be utilised by other researcher than those who got the award.
- Use of appropriate measures to prevent management from overriding control mechanisms. Are there administrative, economic and regulative obstacles in the assessment and management process that counteracts the objectives of the programme? What kind of “lean administration” can be developed in order to both control the process, but also give room for development and increasing R&D-capacity?
- How is the FNI-model and grant allocation being evaluated? Impact indicators? Use of indicators? Models and incentives for developing systematic statistical documentation? Evaluation of societal impact – impact on the knowledge creation system?

Appendix 3. Persons Interviewed and Examples of Comments from the Interviews

Interviews

Interviews were made with Estrela Chunguana, Coordinator for Sida contribution, MCT, Alasia Atanasio, Executive Director, FNI, Antonio Leao, National Director of Research, technology, Innovation and Development, MCT, Rufino Jujamo, Communicating Science, MCT, Lucas Donor coordinator for EMU, proposal evaluators, representatives of the steering committee, researchers/teachers funded and not funded by FNI.

Examples of comments from the interviews:

- 1 Researchers not funded by FNI. The procedure of call and evaluation is good. No feedback on the proposal. A written feedback is highly wanted.
- 2 University Teacher: 9 month project quite to short. The possibility of long term projects should be promoted. There is a lack of access to international journals, even if some are available in library. This plays an important role for the quality of the proposals. Transitional grant for people coming back from a PhD, Post Doc!
- 3 Evaluator of proposals. Applications from researchers outside the Maputo are generally of very poor quality. A slight improvement was noticed after courses in proposal writing. There are poor conditions for conducting research outside Maputo. The criteria for evaluation are not formulated for possible support to fundamental research, (or deeper research). The evaluator is paid 50U\$/evaluation.
- 4 A representative of the Steering Committee. Fundamental research is yet not a part of the proposals. The strategic document mentions fundamental research, but yet there are no resources for support, should perhaps be done in collaboration with external partners. Applied research is the priority. Funds should go directly to FNI, big risk of delay of funding if it goes to MCT first. There is sometimes a delay in releasing the funds, which, especially for project in Agriculture, is a big problem due to annual change in weather etc. No clear criteria but: the steering committee tries to have a final suggestion for approved projects that reflects all thematic areas of priority, geographical areas, gender. However, the quality of the proposals must always reach a good level. The steering committee is well aware of the problem that the projects are often not creating new knowledge. The proposals are more directed at development or implementation of already existing research results. For interdisciplinary research it must be clearly stated what each discipline contribute with and how they fit into the project?
- 5 A representative of the Steering Committee: The project proposals are often of poor quality, especially those originating outside Maputo. Very few female researchers applies for funds. A way to increase the number of proposals from females may be courses in proposal writing directed especially at females. To increase the quality of proposals there may be special calls for Public universities outside Maputo in joint Maputo projects.
- 6 Researcher who received funds from FNI: Long term projects are needed. Testing of equipment or models often takes at least two years.
- 7 Evaluator: evaluated 2 proposals from FNI, one of which of very high quality. The proposal are anonymous, however, it is always possible to get an idea of who is applying. Still there is no problem with conflict of interest. Writing comments on the proposals is a part of the reviewing, however

there is no feedback on those not approved. However, the result of the reviewing is public. Agriculture seems to get too much money (health not as much as may be expected expect).

- 8 Teacher who received funds from FNI: One year projects are far too short for research. The time for distribution of funds, ca 6 months, is not acceptable! No incentive for Publishing. There is no strategy for research within the department. The salaries at the University are too low, which means consulting is necessary. Funding of research for BSc and MSc thesis is of high priority. The feedback on the proposals is highly necessary, but it is now not good or even lacking. Reporting each quarter of the year of the project is too often, perhaps for the economy only! A feedback on the final reports to FNI is also very important!
- 9 MCT representative: Long term support from donors is necessary for FNI to make funding effective.
- 10 UEM representative: It would be good if FNI could offer Post Doc scholarships, but the research must then be on problems in Mozambique and the researcher not too old (<35 years). For interdisciplinary research, the maximum budget may be a limitation. For the dissemination of research results it would be good if FNI had some funds for Participation in the MCT annual National Science Exhibitions. There is a great need for financing MSc thesis work and six months Scholarships from FNI would be a way to solve this need. The experience is that there is a severe delay in the allocation of funds. The time for delivery of funds should be scheduled (this can only be done if there is a regular donation for the FNI activities). There should be earmarked budgets for the three functions of FNI: Research, Innovation and strategic projects?

Appendix 4. References, List of Relevant Background Documents, Reports and Books

- Agenda 2025. The Nations Vision and Strategies. Committee of Counsellors. November 2003. Maputo-Mozambique.
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Appendix 5. Terms of References for an in-depth Assessment of Sida Support to Ministry of Science and Technology, MCT, within the Research Cooperation with Mozambique

Background

Sida has been supporting MCT since 2005. The first contribution of 3 MSEK was granted to MCT to support the development of the strategy document “Mozambique Science, Technology and Innovation”, MOSTIS.

The second Sida contribution of 15.4 MSEK for the period 2007–2009 was provided to support the activities within the five sub-programs:

- i) popularising Science, Technology and Innovation;
- ii) establishment of a centre for innovation and applied research in agriculture;
- iii) human resource development; iv) indicators for the national STI system;
- v) enhancing the capacity and capability of the National Research Fund, FNI.

All five sub-programs were deemed as crucial for the implementation of the MOSTIS and development of Science, Technology and Innovation culture in Mozambique.

For the agreement period 2007–2009 support to the four, (i-iv) sub-programs was viewed as one-time support. Nevertheless, Sida has a plan to continue with its support to the National Research Fund, FNI during one or two agreement periods. The main condition for Sida’s support is the other donors’ willingness, i.e. Finland, World Bank, Netherlands, Germany, to put funds into FNI basket.

The FNI is a national, independent institution established by and operating under a mandate from the Minister of Science and Technology. The FNI mobilises financial resources from a variety of sources interested in promoting STI in Mozambique and is responsible for management of research funds, i.e. funding of research projects and dissemination of research results.

During the period 2007–2009 Sida has been in agreement with MCT and funds to FNI were channeled through MCT. In line with Sida’s principles on ownership of programs, the MCT is responsible for implementation and for proper administration of funds.

Negotiations for a new five-year agreement period 2010–2014 are in process. MCT and FNI are relatively new organisations and new partners for Sida. Before Sida makes the decision regarding continued support there is a need to evaluate the previous cooperation period 2007–2009.

Considering Sida’s long-term plans to support FNI as an important institution for STI in Mozambique, there is a need to carry out an in-depth assessment of MCT/FNI, i.e. to assess their potential to use of funds for implementation of their strategy and capability to establish appropriate routines and systems for open and competitive management of research funds as well as a system for evaluation and monitoring research quality and research outcomes.

Objectives

The overview of MCT/FNI should answer question whether the Sida funds were handled in accordance with the agreement. In-depth assessment of FNI, i.e. its current system of research funds management should identify weaknesses in the system and provide both Sida and FNI with recommendations on how the system should be improved and further developed.

Assignment

The evaluator shall make an in-depth assessment of research cooperation with MCT and an institutional assessment of FNI and its management system.

Scope of the assessment

The research cooperation with MCT shall be assessed for the period from 1 October 2007 to 30 November 2009.

Special emphasizes should be given to the following areas:

Management of Sida supported activities at MCT and research management at FNI

- a. in-depth review and assess the planning and budgeting process, the regulation, mandates of operations, documentation
- b. procedures for selection of activities and research projects to be supported from Sida funds
- c. the transparency in the distribution and administration of funds and the corruption risks
- d. assessment of how the reporting of results after completed research projects is administrated, disseminated and used
- e. the procedures for recording use, safeguarding and disposal of assets (equipment, tools or other commodities).
- f. appropriate measures to prevent management from overriding control mechanisms
- g. provisions for appropriate procedures for avoiding conflict of interest.

The analysis shall include MCT's organisational and administrative structure (including regional and provincial offices) and the dimensioning of this structure in relation to its functions, capabilities and duties.

The assignment shall result in recommendations and an action plan in respect of the above-mentioned points. The focus of the assessment shall be organizational structure and its systems and routines for fulfilling its agreed obligations vis-à-vis Sida. In addition to this, the consultant has the right to suggest changes to these Terms of Reference that can be considered to be relevance during the work and can also make recommendations to address any weaknesses identified. The recommendations should be presented in priority with a suggested timing for implementing.

Key contact persons are:

At MCT:

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Helena Fernandes, Head of Financial Department, helena.fernandes@mct.gov.mz

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At Sida, Stockholm:

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At the Swedish Embassy, Maputo

- Bengt A. Johansson, Country Director, Team Mozambique,
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- Joao Jussar, NPO, João Jussar@foreign.ministry.se
- Joanna Lundgren, Controller, TeamMoz,
- Joanna Lundgren@foreign.ministry.se

Requirements

- Experience from working with research systems in developing countries including Africa.
- Broad knowledge of research management and experience of organization analysis and organization development.
- Experience in assessing the needs of national STI systems
- Experience from reviewing research and innovation systems.
- Experience from international cooperation.
- Knowledge of Sida, its policies, strategies and methods for capacity building within research.
- Experience in Result based management
- Fluency in English and knowledge in Portuguese
- Visits and Reporting

The auditor shall visit MCT and FNI. The auditor shall also study relevant material and meet Sida-staff at Sida-Stockholm.

The audit shall conclude with recommendations in preferential order to MCT/FNI and to Sida. If the auditors detect fraud it shall be presented in the report with an amount that could be basis for reimbursement.

The report shall not exceed 30 pages, be written in English and submitted to Sida in two printed copies and one digital not later than 20 December 2009.

Organisation, Time schedule and Budget

The audit shall be carried out at MCT/FNI and reported to Sida within 45 days after signing of the contract. A final report in English shall be submitted to Sida no later than two weeks after Sida has given its comments to the draft report.

The assignment is estimated to require 5 person weeks and must not exceed SEK 300 000 including fees and reimbursement costs.

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THE NATIONAL RESEARCH FUND (FNI) AS A TOOL FOR RESEARCH CAPACITY BUILDING IN MOZAMBIQUE

The Ministry of Science and Technology (MCT) created in 2005 is a central organ of the Government tasked to regulate, plan, coordinate, monitor and evaluate activities related to science and technology in Mozambique. From the onset of its creation, MCT was committed to develop the National Research System and to create a National Research Fund, FNI. Sida's contribution to MCT of 15.4 MSEK for the period 2007-2009 was directed to the research and innovation activities managed by MCT through FNI. An in-depth assessment of Sida's support to MCT was carried out in 2010. The assessment was very positive and Sida is recommended to continue the support to MCT with focus on the National Research Fund, FNI.

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