



**FINAL EVALUATION**

**Draft Final Report**

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## ABBREVIATIONS

CCM	Minister's Advisory Council/ Conselho Consultivo do Ministro
CIDE	Centre for Research and Development in Ethnobotany
CITT	Centre for Research and Technology Transfer for Rural Development
CMC	Community Multimedia Centre
CNCT	National Council for Science and Technology
COFISA	Cooperation Framework on Innovation Systems between Finland and South Africa
CPRD	Provincial Digital Resource Centre
CRCT	Regional Centre of Science and Technology
CTA	Confederation of Business Associations of Mozambique
CTA	Chief Technical Advisor
DIIDT	Directorate of Research, Innovation and Technology Transfer
DISI	Directorate of Infrastructures and Information Systems
DPEC	Directorate of Planning, Statistics and Cooperation
EoF	Embassy of Finland
FNI	National Research Fund
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GoF	Government of Finland
GoM	Government of Mozambique
HRD	Human Resource Development
ICT	Information and Communication Technology
IFC	International Finance Corporation
IIA	Institute for Water Research
IIAM	Agricultural Research Institute of Mozambique
ISM	Innovation Space Maputo
MCT	Ministry of Science and Technology
ME&L	Monitoring, Evaluation & Learning
MFA	Ministry for Foreign Affairs of Finland
MOSTIS	Mozambique Science, Technology and Innovation Strategy
MTE	Mid-term evaluation
MTR	Mid-term review
NGO	Non-Governmental Organisation
NIS	National Innovation System
NPC	National Program Coordinator
NSI	National System of Innovation
OECD	The Organisation for Economic Co-operation and Development
PARPA	National Poverty Reduction Programme

PCM	Project Cycle Management
PD	Programme Document
PES	Programa Economico & Social / Economic and Social Plan
PO	Project Officer
R&D	Research and Development
SANBIO	Southern African Network for Biosciences
SC	Steering Committee
SIDA	The Swedish International Development Cooperation Agency
SME	Small and Medium-Sized Enterprise
S&T	Science and Technology
STI	Science, Technology and Innovation
STIFIMO	Programme of Cooperation in Science, Technology and Innovation between Finland and Mozambique
SVB	Supervisory Board
SWAP	Sector-Wide Approach
TA	Technical Assistance
TANZICT	The Information Society and ICT Sector Development Project in Tanzania
TOR	Terms of Reference
UEM	University Eduardo Mondlane
WB	World Bank

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## 1. EXECUTIVE SUMMARY

### The assignment

The aim of the assignment was to conduct the Final Evaluation of the Cooperation in Science, Technology and Innovation between Finland and Mozambique (STIFIMO). The programme started on November 2009 and its implementation concluded on December 2014. This Final Evaluation was conducted from June to August of 2015 with missions in Finland and in Mozambique.

STIFIMO was conceived primarily to support the development of the Mozambique national STI strategy, MOSTIS. The programme purpose was to strengthen the foundations of the STI system in three principal ways: capacity building of key STI institutions; improved cooperation in four target areas: ICT, technology transfer, water and biotechnology; and the establishment of funding and support services for science and technology based innovation. The final objective was to contribute effectively to economic growth and poverty alleviation.

### Approach to the evaluation

As set out in the ToR: “The overall objective of the evaluation is to provide the Ministry for Foreign Affairs of Finland with recommendations, and possible tools, on how to improve identification, planning and implementation of development projects/programs in general, and science, innovation and technology projects, in particular”.

The approach of the evaluation team was therefore: (i) to investigate the origins of the concepts leading the use STI as a tool to increase growth and reduce poverty; (ii) to assess the conceptual approach and the design of the programme; (iii) to evaluate the implementation process; and (iv) to identify experiences, practices and results that can contribute in the identification, planning and execution of future programs to MFA and to MCT.

### Methodology applied

The methodology applied a combination of tools and techniques aiming to identify the processes and systems used to reach the expected results. Comparative analysis was performed to determine deviations from plan to actual activities. Conceptual and contextual analysis was conducted to understand and assess the logic and the design of programme and project components.

The methods used for comparative analysis were quantitative comparisons of expenditure and outputs compared to actual disbursement indicated in the Programme’s Final Report, qualitative comparisons between expected results and actual achievements, and identification of projects with the highest and lowest probabilities to contribute to the purpose and objective of the programme. A quantitative assessment system based on accumulative actions and the intuitive perceptions of the evaluators has been applied to project results.

A source of information was interviews with MFA and MCT officials both in Finland and in Mozambique, interviews with stakeholders, beneficiaries, former TA members and key participants in the design and conceptual preparation of STIFIMO. All available documentary was reviewed, and a few site visits were organized making it possible to observe and judge project contributions to beneficiary institutions.

### Constrains and limitations

The evaluation executed its tasks as planned, without significant problems or constrains. However, the time allocated to carry out the field phase (12 working days) was insufficient to verify the impact and or the sustainability of past programme activities. It was also not possible to verify if there were government officials, business people, students or academicians applying the new concepts and tools learned in the participations of projects, and if those innovative concepts were useful and practical in the day to day community life.

### Main findings

#### - Programme design and Relevance

1. STIFIMO has made contributions and produced useful results but has fallen short in accomplishing its overall purpose and objectives. From the very beginning STIFIMO showed flaws in the design and conceptualization phase, in the selection and implementation structures and in its managerial capacity to use resources and produce outcomes. As a result, the enhancement of the STI in Mozambique showed only modest results and the contribution to reduce poverty was not realized.
2. The relevance of the programme was seriously affected by a design that was not in accordance with the local reality, and the proposed model of increasing growth and reducing poverty through the use of STI tools was not pertinent or adequate. The design of the programme did not consider in full the real priorities of the country nor the institutional and economic development of Mozambique.
3. The programme did not recognize for example that agriculture is by far the most important sector in terms of potential for economic growth and poverty reduction. More than 65% of the population is directly engaged in subsistence agriculture, and low productivity is explained in large part by the very low penetration of modern methods and equipment (e.g. irrigation systems, use of certified seeds).
4. Similarly, there was not a proper assessment of the quality and quantity of SMEs (only a few are qualified to work on innovations issues), or over its capability to process and add value to basic products. A majority of the workforce has low skills. Thus a vital component for innovation is missing in Mozambique.
5. The designers neglected recommendations made by specialized institutions working in innovation activities in less developed countries. The international experience shows that models linking STI with the development and growth of the country require a number of preconditions that Mozambique lacks.
6. Ambitious goals aimed to spread resources all over the country without a clear focus on sectors or on activities. As the country lacks sufficient and efficient institutions, which would provide the essential components of an innovation system or ecosystem, modest actions focusing on the

agricultural and rural sectors, for example, would have probably generated greater impacts over poverty and growth.

#### **- Implementation and management, efficiency and effectiveness**

7. Implementation of STIFIMO was difficult and with many obstacles along the way. These have involved modifying and replacing the fundamental Programme Document (strategy and navigation chart), changing mechanisms, implementation modalities, TA teams' substitutions and changing contracting companies, which have seriously undermined the capacity of the Programme to perform efficiently and effectively. As a result low expenditure rates have affected budget allocation and almost 50% of total budget was not realized.
8. The institutional capacity in Mozambique was not ready to absorb programme activities. The systems used by the Ministry of Science and Technology were precarious at handling basic tasks, use outdated models, structures and technology. There was very little capacity to develop STI system at the time. Identification and programming failed to recognize the problems faced by the institutions it was aiming to assist.
9. STIFIMO has failed to achieve the objectives set down in both the initial and revised Programme Documents (PD). Expenditure on project activities at the end of the programme was 48%, well below expectations leaving many activities incomplete or without action. STIFIMO comprises nine 'projects'. In some of these nothing of note has been delivered. Even in the best, and it must be said that five are achieving some meaningful outputs, these outputs are well below and behind target. MCT lacks the administrative capacity and the priority to process authorization, procurement and expenditure as envisaged.
10. The initial problems that inspired the review of the Programme Document were not resolved with the new PD. On the contrary, the new PD needed time to adjust to the new structure and was caught in a centralized and inefficient management system slowing down expenditure even more than precedent TA. The last TA team was not able to reverse this situation and was trapped by the procurement and financial norms imposed by the MCT.
11. The Steering Committee (SC) was not fit to direct and to monitor project activities. Under the original PD the Committee was composed of 27 representatives from the government, private sector, universities, research centers and a representative from the Embassy of Finland. With this large number of members it was difficult to reach consensus and even more difficult to organize meetings. As a result its role was minimized and its capacity to make decisions over plans, budgets, and policy directions was severely hampered. In the second period the SC was reduced to 5 members with additional invitees, management and control improved but expenditure remained low.
12. In the implementing period, interruptions and substitutions in the decision making body affected STIFIMO. Key actors originally supporting and creating STIFIMO, like the Minister of Science and Technology in Mozambique, the Finnish Ambassador, and the national coordinator



were changed, making the programme vulnerable to new officials and with potentially long periods in the learning curve before they could be efficient. Some key areas, especially procurement, were modified in a negative manner, slowing down implementation significantly.

13. This evaluation has also encountered a number of positive results and experiences that have contributed to improve institutions, expand knowledge, transfer know how on technical and managerial issues, modernize facilities and labs, and support the research centers capacity to investigate. There is also the recognition of successful experiences in the transfer and application of ICT in rural areas, scholarships to young entrepreneurs and the application of planning tools in the MCT. These are a few samples of the Programme's positive contributions to Mozambique.

### Lessons Learned

14. Proposals from partner countries should be checked out adequately. The Concept Note from MCT was a very well written document to support the development of the MCT. Unfortunately, the picture portraying the STI situation in Mozambique was inaccurate. It is surprising that this was not checked out, as studies of several African and other less developed countries would have shown potential pitfalls to its implementation.
15. It is vital to ensure a common understanding of the contract entered into by the respective ministries. MCT and MFA seem to have persistent misunderstandings of the purpose of the programme. This may have to be done at the highest level.
16. Monitoring and evaluation needs to inform risk management. Current risk matrices present static picture of risk minimization giving rise to complacency. It has no management capacity as there is no indicator to trigger action. Hence it cannot be used to manage risk. Quantitative indicators such as expenditure or timetable could be used as could qualitative ones such as feedback from TA.
17. Institutional capacity assessment is vital. The actual capacity of the partner body to manage and control funds, solid and proven structures and mechanisms accounting expenditure and procurement capacity needs to be reviewed.
18. Allocation of block funding over a prolonged period encourages misunderstandings over the nature of the support and does not focus participants on the results. Conditional funding linked to performance may be a way of avoiding this and improving efficiency and effectiveness.

## Recommendations

19. The current Manual for Bilateral Programs contains procedures, which if followed appropriately, would avoid many of the failings noted in the programming of STIFIMO. This Manual is therefore in general recommended for its current task.
20. Project conceptualization and identification should take account of the country's institutional capacity to deliver and resources need to be devoted to this and risks made clear.
21. The ToR for the development of a programme document should include
  - feedback, which indicates that the concept may not be appropriate;
  - that the delivery modality may be different from that envisaged.
22. Risk management must include indicators and contingencies, which can trigger a warning and a response.
23. Assistance in Science, Technology and Innovation for the least developed countries should put emphasis of actions should be on 'bottom up' interventions involving improvements and adaptations of technologies and practices.
24. ICT can have a catalytic effect throughout societies and should continue to be a priority for Finnish programmes.

## 2. IMPLEMENTATION OF THE FINAL EVALUATION

### 2.1. Overall mandate

The Final Evaluation of the STIFIMO Programme was conducted between May to August 2015 in Helsinki, Finland and in Maputo, Mozambique. The assessment is part of an intergovernmental agreement of the Programme of Cooperation in Science, Technology and Innovation (STI) between Finland and Mozambique dated 17 November 2009. The evaluation has covered the whole implementation cycle; from designing in 2009 to final implementation in December 2014. The Ministry of Foreign Affairs (MFA) of the Government of Finland was the responsible body to supervise Programme execution. The Ministry of Science, Technology and Innovation (MCT) was a direct beneficiary and responsible for implementation of Programme and project activities. A select group of institutions (public and private), research centers, universities and community based organizations were the main and direct beneficiaries of STIFIMO. The overall purpose was to have an enhanced national science, technology and innovation system in place, which contributes effectively to economic growth and poverty alleviation.

### 2.2. Approach to the evaluation

As set out in the ToR: *“The overall objective of the evaluation is to provide the Ministry for Foreign Affairs of Finland with recommendations, and possible tools, on how to improve identification, planning and implementation of development projects/programs in general, and science, innovation and technology projects, in particular”*<sup>1</sup>.

The approach of the evaluation team was therefore: (i) to investigate the origins of the concepts leading the use STI as a tool to increase growth and reduce poverty; (ii) to assess the conceptual approach and the design of the programme; (iii) to evaluate the implementation process; and (iv) to identify experiences, practices and results that can contribute in the identification, planning and execution of future programs to MFA and to MCT.

Since STIFIMO’s structure and components have been reviewed several times, the outcome of these process was documented in the Mid Term Evaluation (May 2013). MTE produced a number of recommendations and in depth analysis was performed over many components and projects under implementation leading to an overall presentation of STIFIMO performance, efficiency and effectiveness. Under this assignment the evaluation cycle has concluded by identifying and providing lessons to be learnt, investigating models systems and structures than can be of use in later cooperation programs.

### 2.3. Main events in the evaluation process

Between conception and final implementation STIFIMO went through significant conceptual and operational changes. The original design was reviewed, the implementation mechanism modified, the

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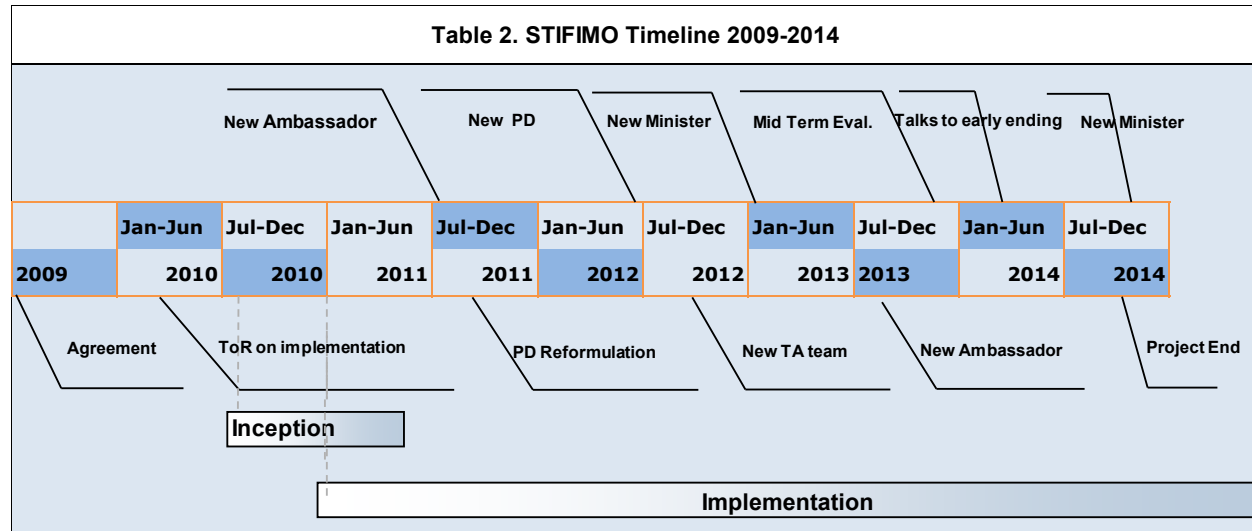
<sup>1</sup> Terms Of Reference for STIFIMO Final Evaluation, page 5.

TA team substituted and the Mid Term Evaluation suggested significant reforms. The following graph synthetizes these revisions and amendments.

**Table 1. Main operational events in the implementation process**

ACTIVITIES	DESIGN	IMPLEMENTATION						EVALUATION
PERIODS	2009	2010	2011	2012	2013	2014	2015	
2009 - March	Concept and Ideas							
2009 - April - Octo	Bilateral consultations							
2009 - Octo - Nov	Appraisal and PD 1							
2010 - January		Cooperation agreement TA arrived First Disbursement NIRAS took Ramboll						
2010 June - Aug								
2010 - Octo								
2010 Nov - Dec								
2011 - Jan			Inception Phase PD review PD 2 preparation					
2011 - April								
2011 - May - June								
2012 - May				New PD2 Board approved PD2 New TA arrival				
2012 - June								
2012 - July								
2013 - June					MTE			
2014 - Sep						End of activities End project		
2014 - Dec								
2015 - August							Final Evaluation	

In addition to the structural and operational reviews of STIFIMO, there are other events from policy, politics and management that affected the implementation of the programme. The appointment of new ministers on both sides, ambassadors, revision of concepts and development goals reflect changes in the decision making process and in the overall execution of the programme and project activities. Table 2 provides a synoptic view of these events<sup>2</sup>.



## 2.4. Foundations and origins of the programme.

### Origins

STIFIMO arose in the context of the 2007 Development Policy Programme, in which Mozambique is one of eight long-term partner countries with Finland. It also arose within the framework programme published in July 2009 “Africa in Finnish Development Policy,” which states that the most important goal of Finnish development policy in Africa is the eradication of poverty and promotion of ecologically, economically and socially sustainable development in line with the UN Millennium Development Goals, adopted in 2000. The role of the private sector and trade as the engine for economic development is the focus of increasing emphasis.

STIFIMO was a response to developments within Mozambique, which involved the creation of the Ministry of Science and Technology (MCT) and the formulation of MOSTIS, the Mozambique Science, Technology and Innovation Strategy.

The Government of Mozambique's National Poverty Reduction Programme (PARPA II) for years 2006-2009 identified science, technology and ICT as fundamental tools for accelerated national development. Policy frameworks for science, technology and innovation system development as well as for ICT were steered by the Ministry of Higher Education and Science and Technology (2000-2004) and then the new

<sup>2</sup> A detailed timeline of activities, actions and actors is presented in Annex 4.

Ministry of Science and Technology after 2005. Under the Government Five Year Plan and the Presidential Decree establishing the ministry, MCT was in charge of the promotion and strategic coordination of both sectoral and crosscutting STI-activities.

### **MOSTIS**

The Mozambique Science, Technology and Innovation Strategy (MOSTIS) was approved by the Cabinet Council on 27th June 2006. This is a well written and coherent document. The overall objective of MOSTIS is that in 2025, Mozambique will be fully using science and technology for economic growth and poverty alleviation. It specifies ten strategic objectives, which include:

- 1 – Foster a culture of innovation throughout Mozambican society.
- 2 – Promote grass-roots innovation and the use of S&T-based approaches by poor and disadvantaged communities.
- 3 – Promote R&D and innovation within the public and private sectors.
- 5 – Promote the use of ICT for good governance and service delivery, and for the diffusion of knowledge, in support of poverty reduction and economic growth.
- 9 – Review, evaluate and enhance the performance of the S&T system.

With regard to the innovation system, MOSTIS states, 'Mozambique has several components of a fully developed national S&T system. However, these components themselves require strengthening, while missing components should be identified and established.' Its priorities are expressed: 'The major portion of MCT's resources and efforts should be targeted at the public sector components, building up their capabilities and capacities and using them as implementing agencies for the strategy. In doing so, MCT should establish an environment for the private sector components that encourages them to play their role and become aligned with the strategy (p. 78).'

Access to donor funds was seen as an essential means of developing STIFIMO, 'A key source of funding for S&T in Mozambique is through international funding partners, agencies and instruments (p. 80).'

### **The South African Example**

At the same time as MOSTIS was being approved, COFISA was underway South Africa. COFISA (Cooperation Framework on Innovation Systems between Finland and South Africa) operated between 2006 and 2012. The objective of COFISA was to bring together organizations and actors of South African innovation system into a nationwide cooperation network. It had a number of activities including Living Labs, which enabled people to come together with ICT experts in creating products and services. Creation, development and management of Science Parks was also promoted across South Africa. Foresight was introduced. MFA reports that one of COFISA's greatest achievements was the change in the attitudes of South African higher education institutions and the public sector regarding innovation systems and the possibilities they offer for growth and wellbeing of the whole society. It provided an example in practice of what might be achieved in Mozambique.

### **Finland- Mozambique relations**

Up to that time, GoF had contributed to the development of Mozambican knowledge-based economy as part of its overall support to education. The bulk of support was channeled to the education sector

common fund to improve the quality of basic education, to enhance secondary education and to improve administration of the sector.

From 2006 the GoF supported the Ministry of Science and Technology by financing an Advisor to the Minister through UNDP. The primary objective of the advisor was to provide advisory support to develop the national STI and ICT instruments, to support strategic planning and to enhance the implementation of STI reforms in all sectors of Mozambican public administration. The project funded through UNDP ended in 2009. The Advisor was charged by the Minister to access the funding sources needed for the implementation of MOSTIS. These included support from World Bank, Sweden (SIDA), Germany (GIZ) and GoF.

### **The approach to Finland**

A Concept Note was presented to MFA indicating the nature of assistance sought. It outlines the vision and components of MOSTIS. It also includes a clear section on ICT policy. It recognizes that the Finnish Science, Technology and Innovation system relies heavily on the strong collaboration between Government, Education System and the Private Sector, the so called triple-helix model. It recognizes that this is a highly collaborative system. The launching of the Finland's second Knowledge Society Strategy for 2007-2015 is acknowledged and the key strengths of the Finnish Innovation Society are summarized, which include:

- Strong systemic view of the innovation society, recognizing the importance of interdependence and collaboration between research institutions, universities, private sector companies and government;
- Mature, competitive and impact oriented funding and support mechanisms with highly specialized functions for public and private research and development;
- Strong institutional setup and mechanisms for ensuring crosscutting nature and involvement of STI at all levels of society;
- Strong foresight capacity;
- High rate of investment in R&D at national level (3.5% of GDP in 2005).

It compares the Mozambican STI system with that in Finland and notes a series of deficits. It then proposes a series of actions to remedy these deficits. These come down to three components:

- Technical assistance and capacity building;
- Institutional and business collaboration, including trade relations with Finnish enterprises;
- Strategic initiatives with a focus on ICT.

It had a budget of €25 million. The note is well prepared and presented.

### **Terms of Reference and Programme Document**

This concept note forms the basis for the Terms of Reference, which were issued for the drafting of the first Programme Document in early 2009. The resulting Programme Document had two components:

- (1) Strengthening the National Innovation System and;
- (2) Supporting and enabling STI at the provincial and district levels.



With regard to Component One, the objectives of STIFIMO were to improve the institutional capacity and infrastructure of MCT and other key public institutions.

With regard to Component Two, there were three objectives: (i) establishment and functioning of decentralized STI mechanisms, (ii) services to communities and small and medium sized enterprises, and (iii) extending STI education and research.

The programme budget was €22 million.

### **Relevance to Policies**

The PD was in line with MCT policy and with the theory of MOSTIS. However, it must be questioned if it was in line with Finnish policy and with the reality of Mozambique. Following the Inception Period, there was a further Concept Note produced in October 2011 by the TA developing the tasks laid out in the PD. The PD and the Note itself were criticized by one of the TA, who noted the low capacity of MCT already manifested in the implementation of STIFIMO. She also noted severe, capacity constraints in STI in Mozambique. The Note recommended a narrowing of the focus of STIFIMO to enable its resources to be used most effectively mainly in the agriculture sector.

These criticisms were in line with Finnish policy, which puts the highest emphasis on 'The eradication of poverty and promotion of ecologically, economically and socially sustainable development.' As is evidenced by OECD and other work, innovation in the agriculture sector probably has the highest potential to promote economic growth benefiting the poorest sections of society.

It pointed out basic design flaws in the document, which were reiterated in the MTE. The PD is based on wishful thinking. This flows from MCT ambitions to reproduce the successes of COFISA in Mozambique, a country with vastly different conditions, although geographically next to South Africa. The statement in MOSTIS, that, 'Mozambique has several components of a fully developed national S&T system' was far from reality. In the Innovation Capacity Indexes of 2010-11, South Africa was ranked at position 52, above Russia, China and Brazil and one EU member state. Mozambique was ranked at 105. Position. What might work in a middle income country with a developed infrastructure like South Africa needs a full re-evaluation when applied to one of the least developed countries, such as Mozambique.

The 2007 Development Policy document indicates the factors taken into account when planning and programming cooperation. These include:

- The country's need for assistance: poverty level and the state of environment;
- Support already received: action by other donors and level of development funding, joint programming processes, role of multilateral actors and the EU;
- The country's political situation and ownership: the human rights situation, own commitment to deal with development challenges and to build an enabling environment for development, the role of the civil society;
- The added value provided by Finland and its administrative capacity for successful cooperation;
- The status of Finland's development policy priorities in the country's development plans.

Mozambique has clear need for assistance as one of the poorest countries on earth. There was also a correspondence between Mozambique and Finland's development policy priorities in terms of poverty eradication and promoting STI. The second and third points are open to some interpretation. However, there appears to be a fundamental confusion over the fourth point, i.e. the added value, which can be

provided by Finland in the development of innovation systems and structure, given that the gulf between the Finnish experience and Mozambique's situation is so large. Moreover, the second part of this point, 'Administrative capacity for successful cooperation,' seems to have received no attention whatsoever.

This failing is particularly surprising in that the potential pitfalls were pointed out in a 2002 evaluation of bilateral Programs between Mozambique and Finland. This stated that sector wide approaches (SWAPs) in Mozambique have ownership benefits but place administrative burdens on parts of the state apparatus. 'They also imply greater levels of risk for the donors because the sectoral planning, control and monitoring functions pass more fundamentally to the recipient.' It went on to state, 'Finnish program in Mozambique during the period under study here has not necessarily performed very well in these areas, particularly with respect to effectiveness and sustainability. Good assessment prior to and during an intervention will help ensure improvements in this area. This cannot be stressed enough.' [Emphasis added]

It also noted that sector specialists need to be involved in programme development and implementation of SWAPs and that, 'Improved public administration should be given ever more emphasis in interventions.'

MFA policy and practices in programme development and implementation do not appear to have been followed, resulting in a programme, which was unrealistic and continued to be so, in spite of warnings issued in line with policy. This has not benefited Mozambique.

## **2.5. Innovation and development: Is innovation systems approach appropriate for least developed countries?**

There is overwhelming evidence that innovation is a major contributor to economic growth and welfare in a society, and that the lack of it is associated with stagnation and even regression.

There have been a multitude of studies on how innovation can be stimulated in advanced economies, which have given rise to the concepts of 'National Innovation Systems,' and 'Innovation Ecosystems'. These concepts and the techniques, which they employ, have proved useful in characterising economies with regard to their innovation performance or innovation potential. They use a range of indicators to measure innovation performance. When combined they produce a good correlation with wealth and welfare in the societies. For example, the 2010-2011 Innovation Capacity Index Rankings (<http://www.innovationfordevelopmentreport.org>) place Finland in fourth place in the world and Mozambique at 105. position.

While there is debate and dissension on appropriate policies and practices to support innovation in the most advanced economies, they focus on balance of policies and the roles different actors take. However there is no accepted wisdom on how such modes of analysis and good practices may be transferred to or supported in the least developed countries.

Two points are of crucial importance in this regard. The first is the role of the state. Innovation systems approaches regard state intervention as crucial, whether this be through the framing of grant schemes

and tax policies or the setting of agencies to interact with enterprises and other stakeholders. The second is the means of producing an impact on the base of the social pyramid, i.e. the poorest sections of the society.

There is an accepted consensus that state intervention is vital to develop the education system and enable a sizeable proportion of the population to attain high levels of knowledge and skill, particularly in technical disciplines. All successful innovating economies are underpinned by a highly educated population.

### **Capacity of state institutions**

However, in other aspects, the role of the state in the least developed economies is more questionable. As it is these economies, which lack high levels of skill and have poorly performing education systems, such interventions may be ineffective as the state bodies lack the capacity and the credibility to carry out innovation support measures. There is a growing body of evidence that the role of the state becomes more important in the innovation area only when basic conditions and structures have developed sufficiently.

Szogs (2010) states that the institutional infrastructure in developing countries differs immensely from that of developed countries and is most often characterized by institutional inappropriateness and inadequacy to foster innovative activities and lack of physical and human resources. This aspect is vital to note in developing initiatives. OECD (2012) make a very important point, 'It is important that policy messages addressed to developing countries take into account the level of development of their institutions and administrative system – for their success, policies must be “resilient” to weak institutions.'

The weakness of the state system in Mozambique has been pointed out in the Mid Term Evaluation and in the Final Report, which states, 'The recipient organisation must have commensurate with the needs of the program to be implemented.' It also notes that less than 45% of the funds allocated to be channelled through the state system were actually disbursed. This is not just a Mozambican experience. The final report of TANZICT (2014) notes the severe administrative issues that threaten the performance of especially Components 1 and 2, which flow through the state system in Tanzania. Neither is it a problem faced by Programmes supported by Finland. There are a large number of other instances in less developed countries.

Djefflat et al. (2007) found that less than 16% of the allocated funds in Algeria could be absorbed by the national research system, for which the authors indicate that the key element is 'the weakness of the human element,' coupled with a poor institutional and incentive regime. 'Critical mass, defined as the minimum level required of a mix of human, financial and institutional ingredients, appears to be one of the key issues. The importance of absorptive capacity has been highlighted in several contributions as a complementary necessity to knowledge creation.'

Lall and Pietrobelli (2005) looked at National Innovation Systems in sub-Saharan Africa including Ghana, Uganda, Kenya, Tanzania, and Zimbabwe, noting that in some of these countries, government institutions that focus on agriculture seemed 'potentially' better positioned than other institutions to support viable R&D efforts (better funding, knowledge capacities, and linkages to industry). They go on to conclude, however, that most R&D institutions in these countries “generally lack the facilities

(physical and human) to provide meaningful support to industrial enterprise . . . they have no means of assessing the technological needs of industrial enterprise or of diffusing to them the few technologies they have created [or adapted]”. Because of this, “the institutions carry little credibility with the private sector”.

An innovation systems approach puts state systems at the centre of the intervention. This may be inappropriate for the least developed countries. The result is a set of policy statements, which lack means of implementation. Ephraim Daka and Hannes Toivanen (2014) make the following observations about Zambia:

- In spite of strong rhetorical and political commitment to invest in a knowledge-based society in Zambia, true investments in institutions and organisations for a broad-based national system of innovation have not materialised.
- Interactive learning and circulation of knowledge, remain poor or absent and lend little support to the processes of innovation.

The innovating population in the least developed countries is profoundly different from the most developed countries, where the innovation actors are found in institutions and larger enterprises. Djeflat (2007) found that individual innovators represent 84% of the total in Algeria, while the share of enterprises did not exceed 9%. Research centres had only 6%. In France the proportion of institutions reached 68% while the share of individuals did not exceed 16%, another indicator of an innovation system in the stage of maturity.

In 2004, the World Bank produced a matrix of appropriate measures for states with strong, limited and fragile institutions and low, medium and high STI capabilities. Most of Sub-Saharan Africa were classified as having fragile institutions and low STI capabilities. The Bank recommended a ‘Technology Basics Agenda’, involving the creation of demonstrations in health, education, agriculture and crafts, ‘to show that innovation does matter.’

### **Reaching the base of the pyramid**

The OECD (2012) warns that an exclusive focus on high-technology industries (“high-tech myopia”) can be costly if the potential for innovation in other sectors is ignored. Countries can incur high costs without reaping any benefits if they choose sectors that require expertise they lack and are internationally highly competitive.

However, OECD also found that innovation in agriculture is particularly relevant for addressing socioeconomic challenges and fostering growth at the same time. There is evidence that agricultural R&D has a greater impact on poverty reduction than most other public investments. “Inclusive innovation” can provide solutions for reducing gaps in living standards between the richest and poorest groups in society. Such innovations typically consist of producing cheaper (often simplified) versions of existing, often sophisticated, products for purchase by lower-income groups (“frugal innovation” or “innovation for low and middle-income groups”). Many innovations, especially those that address the health and nutritional needs of the poorest, can improve their living conditions substantially, although price remains an issue.

Frugal innovation has received a lot of attention as a method for producing innovations in less developed countries. The approach has much to recommend it. It is not simply a way of getting cheaper

(and potentially inferior) products and services in less developed countries, which are anyway better than no services at all. It is a way of developing innovations, which cannot evolve in the more developed countries, because the challenge does not exist and the factors available to solve it are different and of very different costs.

However, such an approach must be a 'bottom up' approach, which pays attention to local conditions and innovative potentials. There have been noted applications in Mozambique.

Swaansa et al. (2014) examined the application of an innovation platform to improving value chains in goat livestock development in Mozambique, which showed positive results. The study shows the importance of social organization, representation, and incentives to ensure a 'true' participatory innovation process, which is based on demand and embedded in the context. Critical to this is a flexible planning process stimulating incremental change through so-called innovation bundles and reflexive learning (systematically challenging constraining factors). Local institutions embedded in norms and values are crucial to understand people's decisions.

In an urban context, Zita and Lopes (2011) noted several actions of user innovation in enterprises in the Maputo area. These enterprises perform no R&D but adapt their equipment to local needs and show the potential for further product development.

Process-centred user innovation in developing countries potentially has considerable developmental significance. In its own right it can yield substantial productivity gains while also contributing to competitiveness in product-related ways – e.g. through increased product quality or in supporting other kinds of product-centred innovation. But also, over the longer run, it seems to act often as an initial nucleus of innovation capability that lays a basis for the evolution of wider and 'deeper' firm-level capabilities to innovate. However, these developments do not show up in national statistics and do not involve collaboration with other institutions.

For those pursuing the innovation systems approach, there are an increasing number of experts, who indicate that a crucial first step is the creation of learning capacities through bottom up strategies (Casadella, 2006) and adequate learning interactive spaces (Arocena and Sutz, 2003). However, this cannot really be regarded as a systems approach; rather it is enabling the creation of entities, on which a system can then be built.

The OECD 2012 Innovation for Development Report indicated different mechanisms and agents at different stages of development. Unfortunately it conflates low income and middle-income countries in its typology and the examples it gives are from middle-income countries and the diverse situation of India. However, it is instructive a giving responses to local conditions a high priority. It gives priority to two mechanisms of innovation:

- (i) Adoption requires adaptation: Innovation needs to respond to specific "local" conditions for outcomes. This is to be accomplished through incremental innovation based on foreign innovations and technologies. The agents are universities and research institutes, leading private businesses, esp. those with exposure to foreign markets and businesses;
- (ii) Inclusive innovation: for/by low-and middle-income households to improve welfare and access to business opportunities, which also involves incremental innovation based on foreign technology and/or local, traditional knowledge generated "out of necessity." But

there is a role for social innovation helping to introduce technical innovations in communities. The agents are NGOs, small firms, public and private associations engaged in disseminating knowledge via networks, private, often large businesses. However, it must be pointed out that the results of innovation diffusion from large mining operations have been very limited in Africa.

The base of the pyramid is not reached by a top down approach for several reasons. State institutions do not function effectively as conduits for assistance. This is because of their lack of capacity and credibility. There is a tendency of the actors in the state system to pursue research activities or higher technology activities, which absorb the funds available, but do not reach the mass of the population. Daka and Hannes Toivanen (2014) state of Zambia, 'Informal sector and pro-poor innovation policy instruments are absent from the present national system of innovation strategy. Although the overwhelming majority of Zambians live and operate within the confines of the informal economy and in poverty, there are hardly any direct policy strategies or instruments to address these conditions.'

The same can be said of MOSTIS, which states, 'While there is a growing consensus that STI has an important role to play in contributing to poverty reduction, the optimal ways of achieving this are still emerging. At the same time, Mozambique has extremely limited resources related to S&T expertise, infrastructure and finances, which places severe constraints on what is possible in the short term.' The mechanisms for using STI to reduce poverty are left 'in the air.'

Basic improvements gained through learning by doing and incremental adoption of simple innovations are neglected as not really part of the STI system.

#### **Stimulating innovation in least developed countries**

The 'Innovation Systems' approach is an approach, which is drawn from analyses of Northern Countries, principally in Europe and East Asia. In these countries it is an 'ex post' analysis, which arose out of specific conditions. There is evidence that it can be transferred as an 'ex ante' model to middle-income countries, which are developing rapidly, such as Chile, Brazil and Vietnam. It may have validity to emerging middle income African countries such as Botswana and Namibia. However, there is a degree of 'path dependency' in the model and it makes assumptions about the main elements of the system being present. When this kind of analysis is made of the least developed countries, descriptions include words such as 'disarticulated' or 'fragmented.' Essentially there is no system. The approach tries to fit observations into an inappropriate framework.

As pointed out above there is an increasing body of literature (World Bank, 2004 Szoggs, 2009, Watkins et al, 2014), which indicates that a first step is the stimulation of innovation at a 'grass roots' level, through setting up platforms for innovation or supporting user innovation. The development of intermediary local organizations is seen as an important way of doing this and of making innovation sustainable, but changing attitudes. This is being pursued in Component 3 in the TANZICT program and is at the heart of the 'Millennium Villages,' which are spread across Africa, including Mozambique. In STIFIMO, such initiatives were represented by 'Hackathons' and 'Kids Clubs.' SAIS is trying to stimulate intermediary bodies in all its participating countries.

High-technology sectors should not be neglected. All countries have ambitions and the role of primary producer in the world market has historically been disadvantageous in the terms of trade. ICT has a strong potential for development, because of its low entry costs and wide range of applications. A

second area is energy, which although having higher barriers to entry is an essential condition to development in all areas. Other areas need to be decided on the strengths and opportunities of the situation.

Analysis of the innovation situation in the country remains very important. However, it needs to be undertaken from the base up. One means of doing this is reported by Agapitov (2014) in final report of Promoting Inclusive Innovation in India Phase II (PIIP), supported by MFA. PIIP have developed a customized ecosystem diagnosis framework to analyse constraints and opportunities to innovation and delivery of basic services to the poor. The ecosystem diagnosis provides a methodology for analysing the role, importance, limitations, and opportunities of public bodies in a particular sector and region/country as well as assessing the dynamic set of linkages among the non-state providers, their relationships with beneficiaries, the government, and the investors.

## 2.6. The role of innovation in development in Mozambique

The vision for STI in Mozambique's Science, Technology and Innovation Strategy (MOSTIS) is: 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 wellbeing.

MOSTIS recognises the scarcity of resources and states they should be focused on areas and sectors with the largest potential impact (direct and indirect) on poverty reduction, wealth creation and improvement of social wellbeing. MOSTIS takes the widest view of innovation, which refers both to the process by which new products and services enter the market, including the creation of new businesses, and to innovation by poor and remote communities themselves, based on indigenous and other knowledge to improve their quality of life. "Both types of innovation are key within the MOSTIS."<sup>3</sup>

Thus innovation encompasses entrepreneurship, adoption and adaptation of products and practices from elsewhere and basic improvements in means of production on the basis of local knowledge. This is a far cry from the view of STI taken in advanced economies, but in the context of a less developed country with the primary aim of eradicating poverty, it is appropriate.

MOSTIS notes the predominance of the family-oriented small-scale farming in Mozambique, but notes that the dilemma about the role of agriculture in development is that while small-holder farming alone can rarely provide a reliable route out of poverty, it is an essential subcomponent of poverty eradication. Thus interventions aiming at ensuring basic production for subsistence needs are foreseen, while considering means to go beyond subsistence to wealth creation. MOSTIS also has a section on 'Grass roots innovation,' involving the poorest sections of society in developing their own improvements.

### **Information and Communication Technologies**

ICTs are an essential element of a knowledge-based economy, as well as being an engine to promote the rapid and sustainable growth of developing countries. The rapid growth of mobile communications in Africa has facilitated information exchange across the continent. The relatively low entry costs into the

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<sup>3</sup> Republic of Mozambique, Mozambique Science, Technology and Innovation Strategy (MOSTIS) p. 13

sector also facilitate access in even the least developed economies. MOSTIS recognises their potential to bring public services to all citizens, and for the absorption of knowledge for poverty reduction.

The ICT Policy Implementation Strategy, approved by the Council of Ministers in June 2002 recognises three major challenges to achieve the rapid spread of the use of ICTs in Mozambique, which includes

- Increase of the base of human resources with solid skills in ICTs throughout the country;
- Expansion and modernisation of the telecommunications infrastructure;
- Reform of the sector to facilitate free competition and attract investment.

The Strategy has the following objectives:

- To raise people's awareness of ICTs and their potential for development;
- To combat absolute poverty and to raise living standards;
- To provide universal access to information;
- To expand the use of ICTs in the national education system;
- ICT training for managers, community leaders, women, youth and children;
- To improve the efficiency and to promote investment in ICTs;
- To promoting equal access to development opportunities.

Both innovation and ICT are seen as having major roles in combatting poverty.

## 2.7. Concluding remarks

### **Considerations for programme design**

Both MOSTIS and the ICT Policy Implementation Strategy are strategies. Their implementation therefore depends on their translation into operational Programs and plans. MOSTIS is an ambitious strategy with short, medium and long term goals, the latter to be achieved within 10 years, i.e. by 2015. It has 10 strategic objectives, which cover wide areas of operation. The programming needed to reach these objectives is considerable. This can be shown by taking three of the strategic objectives.

With regard to its first strategic objective, 'Foster a culture of innovation throughout Mozambican Society,' the two short term Programs to be initiative are:

- Establish mechanisms for the diffusion and dissemination of S&T information;
- Establish mobile S&T demonstrations.

With regard to the second strategic objective, 'Promote grass-roots innovation and the use of S&T-based approaches by poor and disadvantaged communities', it is more concrete in one of its short term objectives, 'Establish the three Regional Centres for Science and Technology (CRCTs)'.

But the second one is less well defined, 'Encourage collaborative approaches to addressing community problems using S&T amongst impoverished communities.'

Strategic objective Five deals with the promotion of ICT in support of poverty reduction and economic growth. It has several short term programming objectives:



- Stimulate research Programs at academic institutions to study low-cost access solutions (wireless technologies, low- cost computers, etc.);
- Use of ICTs to mitigate the impact of HIV/AIDS and reduce the vulnerability of the rural population;
- Establish a national program for ICT skills development, having a special focus on youth, trainers and ICT professionals;
- Develop a range of multimedia-based learning material focused on ICT knowledge and skills, for use by youth and by impoverished communities;
- Establish an S&T knowledge and communication portal;
- Establish a government data centre;
- Establish a Free and Open Software Applications Centre of Excellence within an appropriate institution.

To operationalise these short term objectives for effective programming would require more detailed needs analysis, examination of different scenarios and making choices. Such a lengthy process is not necessarily unreasonable, but does impose a burden on an initial Programme Document, which could not produce the detail necessary in the normal time frame. It would need to give considerable latitude to activities in the inception phase to produce an operationally workable revision.

### **Concepts and reality**

The review of the conceptualization and design process of STIFIMO reveals good intentions to produce and introduce meaningful changes in the reduction of poverty and to improve the overall growth of the country. However, in Mozambique the selection of STI as a tool for development was not the most appropriate to achieve these changes. Evidence found in the MTE and this Final Evaluation shows that the conceptual approach followed by STIFIMO did not take into account two basic pre-conditions to work with programmes related to STI: human resources and institutional capacities presented low levels of development, insufficient yet to warrant the expected results. The efforts made in preparing and conceptualizing sound arguments for the application of an STI programme were not enough and failed to analyze properly the country's capacities to execute a programme of this dimension.

### **Was Mozambique ready for STIFIMO?**

At the institutional level a question has also to be asked if the MCT institutions were prepared to manage innovation programmes. Evidence gathered shows that MCT institutional capacity was not ready for STIFIMO to take off. When STIFIMO was approved MCT was a new institution (less than 5 years), not yet fully operational and with several of its subordinate institutions not in place or with limited working capacity. Many of those institutions were and are still dealing with major issues related for example to the availability human resources to work in STI issues.

### **Strengthening institutions and innovation.**

For many participant institutions STIFIMO was perceived as a direct contribution to institutional establishment and/or contributor to the development of several research centers linked to MCT in terms of human resources, infrastructure and equipment, rather than an investment to support innovation initiatives. A few exceptions such as the work with Eduardo Mondlane University and Instituto Superior de Ciências e Tecnologia de Moçambique (ISCTEM) show movement towards implementation of innovation initiatives.

### **Strategic approach**

The level of engagement and involvement of private sector in the intervention was not properly addressed and is still very limited. MCT's decision to invest more resources in strengthening internal institutions rather than investing in the private sector or increasing the production capacity of the agricultural sector, for example, is questionable when linking institutional activities to the expected reduction of poverty.

### **Basic institutional support**

Evidence found during the MTE and the final evaluation, shows that the institutions currently engaged in developing innovation under MCT, still need basic institutional support to establish themselves as research institutions. After the end of STIFIMO, some of those subordinate institutions are not yet operational at acceptable levels. For example, the Ethnobotany center (CIDE) is still struggling with completion of human resources and the Water Research Institute that has just completed the office arrangements.

## **3. PROGRAMME DEVELOPMENT AND EXECUTION**

This section analyses the execution of the programme, reviewing its more important and significant events. It looks at the history of its implementation process during Programme Documents 1 and 2; it presents the allocation and use of resources and shows the results obtained during the whole implementation period.

### **3.1. Program Revision. First Program Document**

The original programme had two components and five objectives.

<b>Table 3. IMPLEMENTATION OF STIFIMO UNDER THE ORIGINAL PROGRAM PD1</b>				
<b>OBJECTIVES.</b> To support:	1. the low effectiveness of its institutional infrastructure	2. its insufficient outreach to the society in general, and to rural areas in particular,	3. the weak role of the private sector in the STI system,	
	4. insufficient human resources, and	5. a lack of a culture of innovation.		
<b>PURPOSE</b>	To have an enhanced national science, technology and innovation system in place, which contributes effectively to economic growth and poverty alleviation.			
<b>COMPONENTS</b>	<b>Component 1: Strengthening the National System of Innovation</b>	<b>OBJECTIVE 1</b>	<b>OBJECTIVE 2</b>	
		Legislative framework, and institutional capacities and infrastructure, of the strategic national public institutions strengthened	Coordination and collaboration mechanisms of strategic national public sector institutions strengthened, and a culture of innovation promoted	
<b>COMPONENTS</b>	<b>Component 2: Supporting and enabling STI at the provincial and district levels</b>	<b>OBJECTIVE 3</b>	<b>OBJECTIVE 4</b>	<b>OBJECTIVE 5</b>
		Strengthening of decentralized public institutions and infrastructure, and a culture of innovation promoted, to ensure the effective impact of STI services at the provincial and district levels.	Community and private sector development and public-private partnerships enhanced through sustainable STI services and other cooperation mechanisms	Extending the reach of STI education and research, empowering ordinary Mozambicans with STI knowledge, and supporting existing and potential

This was the overall structure of the original Programme Document.

### 3.1.1. The first Programme Administration Team

The first STIFIMO Programme Administration Team (PAT) comprised National Programme Coordinator (NPC), and five-member TA team: CTA, Private Sector Development Expert, Entrepreneurship and Innovation Expert, Rural Development Expert and ICT4D Expert. The latter three were junior experts. According to the CTA, only two members of the team had STI experience. It operated in three phases, of which the first two were:

- Exploration phase: June – October 2010  
Activities during the exploration phase included development and approval of the inception phase plan and mobilisation of the TA team.
- Inception phase: November 2010 – July 2011

The inception phase aimed to lay the foundation to implement STIFIMO by working closely with the stakeholders within and outside MCT. The results planned for the phase were partly achieved. Pilot initiatives, like the Kids' Club, the support for MoRENet, the strengthening of Mozambican institutions through technical assistance and visits to Finland, e.g., FNI visit to Finnish institutions and viability study of the Science and Technology University, and the start of a large-scale mapping of the STI system were undertaken during this phase.

Key constraints and critical factors of the programme were analysed. Lack of MCT ownership was reported to be a significant problem and enough human resources were not allocated fully to deliver STIFIMO activities. Reports indicate that MCT viewed STIFIMO as effectively budget support and did not acknowledge the role of the programme agreed between GoF and GoM. All the reviewed end of mission reports indicate a lack of capacity in MCT and misunderstanding of the role of PAT.

The normal inception procedure of a revised PD was not followed. Capacity analysis of the key programme stakeholders and other detailed assessments (such as gender, poverty and vulnerability, climate and environmental aspects) remained undone. Program operating procedures were discussed and a manual drafted in a workshop in February 2011, but this work was not completed. The rate of STIFIMO implementation was very low and lacked a monitoring and evaluation system.

In April 2011, PAT developed a draft concept paper proposing changes to the STIFIMO programme design in response to a request by the STIFIMO SVB.

The MFA response indicated that it represented a deviation from the original programme aim and purpose:

“In the draft concept paper, STIFIMO is proposed to have only a catalytic role, whereas the partners are responsible for the program outcomes. This is too passive role for the program. STIFIMO, as a program owned by the MCT, should position itself better in the sense that it must state what the outputs/results it is responsible for are.”

MFA also stated the need for more detail on capacity development.

“STIFIMO should clarify its role also in capacity enhancement. What support for enhancing their capacities do the partners need in order for them to be able to contribute to the outcomes expected?”

There were also concerns about the concept paper meeting MFA policy objectives focusing on poverty eradication.

“There are several strategic choices presented in the concept paper, which are not in line with the original PD. The rationale behind these choices is not explicit, which makes it difficult to understand the reasoning. For example, the original PD emphasizes the importance of rural development and in developing the innovation culture (dissemination and mainstreaming) also in rural areas mainly by using informal systems of education. The concept paper proposes mainstreaming more through formal secondary, tertiary and vocational education. However, the formal post primary system does not yet reach rural areas in large extent.”

Although this initiative was not progressed, an Inception Report was produced with six recommendations. Some of these are really points for discussion rather than actual recommendations capable of implementation. However, they include:

- ‘A successful truly Mozambican Innovation System must be based bottom up on analyzed success stories.’
- ‘It is important to decide on the main concrete foci of the program.’
- Strengthening the funding process, both through building the capacity of beneficiaries and making the process quicker.
- The programme needs to be redefined.

This report did not provide a concrete means for progressing the programme.

#### **Change of contacting firm**

During this time, RAMBOLL, the original TA contractor sold its business in the area of development consultancy to NIRAS, who sent representatives to all the contracts taken over with the agreement of the MFA. In the words of the NIRAS representative, ‘It was a mess.’ As there was no progress on revising the PD and dissention among the PAT was public, it is difficult to disagree with the statement. In agreement with MFA, a second PD was to be prepared and a consultant was recruited to prepare this document.

While this was being done, the first year of the programme was undertaken between August 2011 and July 2012. During this time challenges rather than achievements are reported, which include:

- Human resources, where slowness and even obstacles are reported and the MCT is indicated as initiating projects in areas that it lacks expertise in, for example in agriculture;
- ‘A more careful and proactive financial management is required.’
- There were however, some achievements, such as
  - 96 agricultural producers trained in the usage of agricultural machinery;
  - Grass-roots innovators in four locations trained on intellectual property.

The delivery of the original PD ended at the end of July 2012, half way through the envisaged period. The programme had used less than 40 percent of the forecast implementation budget at that point.

The alienation of the 1st PAT is shown in their end of mission reports. Although there was very great internal dissention, there is a consistency in their reports of their relations with MCT, which include the following statements:

- MCT was not prepared for STIFIMO;
- MCT was not prepared to contribute to the programme in the way agreed upon in the Programme Document;
- The administration of MCT did not function in the way and efficiency that external or internal stakeholders expected;
- MCT comprehended STIFIMO as a bank that would cover its normal activities;
- STIFIMO was misunderstood by many internal stakeholders as a 'bank' for funding MCT's activities.
- The programme was too ambitious and 'un-implementable' as designed;
- The Ministry struggled to develop and implement programme management systems;
- The hidden agenda of MCT has been more clear.

### 3.2. Revised Programme Document

The revised Programme Document (PD2) replaced the original PD. Its aim remained the development of the Mozambican national system of innovation (NSI). It maintained that it reflected the experience gained in the implementation of the Programme by the STIFIMO PAT (Program Administration Team), MCT and MFA.

#### 3.2.1. Revision process

The re-planning process of STIFIMO took seven months (from October 2011 to April 2012) instead of two as originally planned. The Mid Term Evaluation commented, 'Leadership of the planning was unclear and there were competing approaches among the key stakeholders. ... Planning sessions were only held in Maputo with no outreach events to the provinces.'

The reasons for the length of time taken are uncertain. However, there were certainly conflicting submissions made to it. The MCT wanted it to support their institutional development. The private sector TA from the first PAT proposed a major re-orientation to agriculture. The overall budget was retained, which meant even larger expenditure would be required in the final two and half years of the programme.

It was not possible to get consensus among the partners. Given the supposedly short-term nature of the assignment and the lack of good baseline studies, it was a difficult assignment to complete, given contradictory assertions by different actors. These included very different perspectives from members of the PAT. However a document was needed and one was produced, which was essentially approved by the MFA in May 2012.

The manner of the production led to shortcomings as the first progress report of the 2nd PAT stated, 'The general assumption was that the implementing agents had participated in the creation of the new PD and, thus, were fully aware of its content and are ready to implement it. A further assumption was that a planning procedure and reporting system would be in place. In retrospect it can be stated that not enough preparation was made to ensure that either of these assumptions did in fact represent the objective truth.'

### 3.2.2. The Revised Programme Document

The Second Programme Document (2nd PD) takes MOSTIS as its base and fulfills the wish of MCT to build the overall STI system in Mozambique. Given the circumstances of its inception and role of the counterpart ministry, it is difficult to imagine it doing anything else.

It recognises the failings of the programme to date, and aims to give greater ownership to MCT and collaborating bodies. Its three components break down into nine projects, which essentially aim at strengthening directorates in MCT or in institutes or agencies attached to MCT. The programme became centralised within MCT. The administrative shortcomings of the MCT were recognised and it was proposed that, 'The program will provide DPEC [the coordinating unit] with the necessary human resources and capacity to perform this task.' Furthermore, procurement and financing were to flow entirely within the existing MCT system, which was recognised in detail.

The programme was to support the institutional development of MCT and its regional bodies. However the state of the institutional development was not recognised. MOSTIS indicates the Mozambique has most of the elements of a national innovation system, which need strengthening [and gaps filling]. Unfortunately, this was not and is not the case.

There was a wide divergence of view between the Programme aims and objectives and those of the MCT. Programme envisaged established institutions developing innovation activities. MCT envisaged institutions being established. The end of mission report of the Senior Private Sector Development Expert (1st PAT) states this clearly, "The program was being implemented as inwardly-oriented within the 'family' of MCT and related institutions, with weak or non-existent links with those STI institutions with direct access to beneficiaries."

The Programme Document has been criticised in MTE, but its failure is not so much in its internal consistency, but in the evidence base on which it relies. It shares the same failure with the first PD. The table below presents summary information about PD2, showing the switch from 2 to 3 components, and highlights in green the sectors recommended by the MTE.

Table 4. IMPLEMENTATION OF STIFIMO UNDER THE REVISED PROGRAM PD2	
COMPONENTS	SECTOR DEVELOPMENT
<b>Component I: STI</b>	<b>1.ICT</b> 2.Water <b>3.Biotechnology</b> 4.Ethnobotany <b>5.Technology Transfer</b>
<b>Component II: STI Services for Small and Medium Enterprises</b>	6.Financing Mechanisms for Science, Technology and Innovation <b>7.Science, Technology and Innovation Services for SMEs</b>
<b>Component III: STI System and Institutional Development</b>	8.Human Resources Development 9.Institutional Framework

Another significant difference between the 2 PDs is the identification of beneficiaries. The revised PD2 clearly defines the support to institutions linked to the government as the main target group. This indicates a misunderstanding of the existing capacity of these institutions to absorb programme components.

Table 5. PD1 BENEFICIARIES		PD2 BENEFICIARIES
1. Rural communities and enterprises which will benefit from the improved services and integrated approach of institutions such as the CRCTs, CPRDs and CMCs;		1. Ministry of Science and Technology and related institutions
2. Individual men, women and youths in rural and urban areas whose access to technology-based learning, employment and other opportunities is improved;		2. The Regional Centers for Science and Technology (CRCT)
3. Existing and new researchers in research institutions and in the private sector who will benefit from increased public funding for research, and from a new culture of research cooperation;		3. The National Research Fund (FNI)
4. Private sector companies and their associations which will benefit from better innovation services, better access to the benefits of science and technology, and improved interaction with public sector institutions;		4. Research institutions related to MCT – CIDE and IIA
5. Public institutions such as MCT, other ministries, universities and research institutions whose institutional capacities, infrastructure and multiple levels of collaboration (internal and external) are all improved		5. The National Biotechnology Program
		6. The Center for Research and Technology Transfer for Rural Development (CITT)
		7. Rural communities in target districts
		8. Researchers, institutions of higher education, and private sector actors working in ICT, water, biotechnology and technology transfer
		9. Key STI institutions – the Academy of Science and the National
		10. SMEs benefitting from access to STI services

Table 6. Program Documents	TA Supply
PD 1	5 Experts
	2 Seniors
	3 Juniors
PD 2	4 Sr. Experts
	CTA
	STI for SMEs
	Regional STI
	ST Funding

### 3.3. Implementation following revision

The response of the different parts of MCT and other bodies to the revised PD seems to have been varied. Change creates uncertainty, which does not help implementation and creates mistrust among the beneficiaries moving from one set of mechanisms to a different in the middle of the navigating path. However, the new PD was closely aligned with MCT ambitions.

#### 3.3.1. The Second Programme Administration Team

After approval of the revised Programme Document, the first Management team was dissolved, and new experts were placed in the departments responsible for the key STIFIMO projects. The new TA Team consisted of four senior experts: CTA, Senior Expert in STI Services for SMEs, Senior Expert in Science and Technology Funding and Senior Expert in Regional STI Systems Development.

Although this team consisted entirely of senior experts and showed no signs of internal dissention, they quickly reported similar problems to the first PAT. The first progress report of December 2012 noted,

“As the main constraint there was identified the lack of capacity of the staff in order to perform in line with the needs and challenges of implementing the Mozambican Strategy for Science, Technology and Innovation (MOSTIS).”

The first critical issue noted involved procurement.



“Procurement takes a very long time, a state of affairs, which is partly due to regulatory issues, but partly the slowness is also a result of MCT internal factors.”

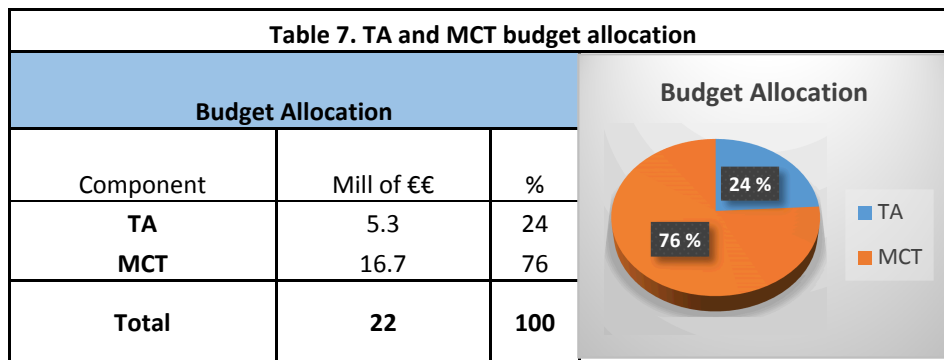
The situation did not improve. One member of the 2nd PAT, who resigned early, triggering the MTE, stated,

‘This is a “mission impossible”. The structure and setup of Stifimo and the perception of the Partners/beneficiaries to look at Stifimo as a pure source of money and having practically all power on for what and how to spend the money does not lead to the expected results.’

At the time of the MTE, the programme management focus had moved onto basic institutional capacity building, financial management, procurement procedures, human resource development, communication and coordination. The 2nd PAT had been recruited for more technical purposes and was not well matched with these needs. Final interviews with the team indicate the view that they were recruited for a programme MCT could not implement.

### 3.4. Managing the budget and programme progress

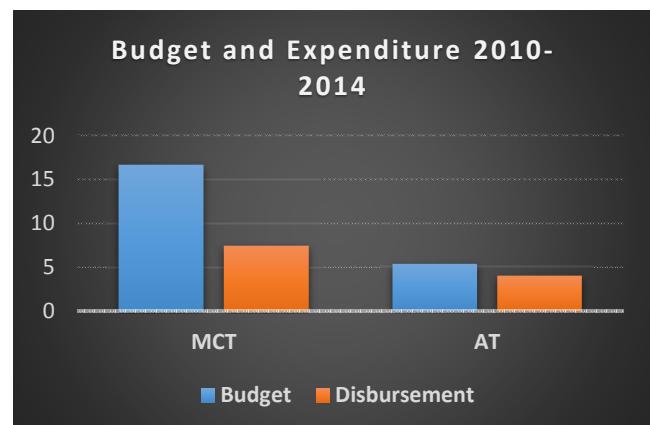
The total amount of funds allocated to STIFIMO was Euro 22 million, distributed in the following way:



Out of the 22 million, the amount assigned to TA was managed directly by the contractor and MFA for the supply of experts as needed, and the accounts are directly controlled in Finland.

In the implementation period 2010-2014 the STIFIMO Final Report accounts an overall expenditure of 45% for the MCT and 75% of TA.

Budget Line	Budget	Disbursement	RATE
MCT	16.7	7.5	45%
AT	5.3	4	75%
<b>TOTAL</b>	<b>22</b>	<b>11.5</b>	<b>52%</b>

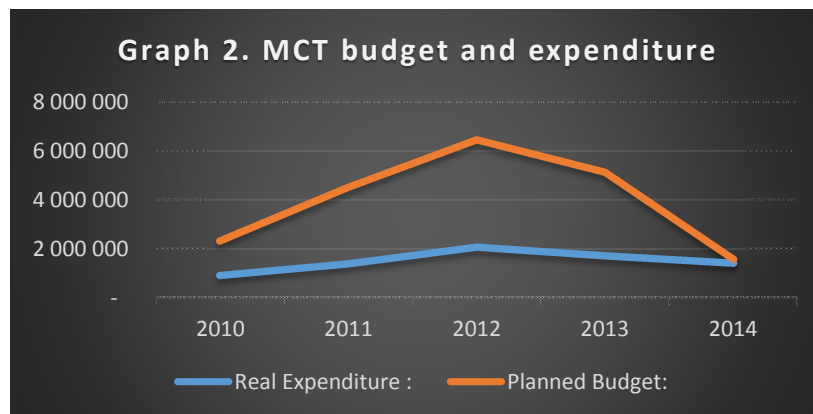


The rate of expenditure of MCT was very low (45%) compared with the TA expenditure (75%). Programme revision, insertion phase, TA team substitution, slow MCT administrative process, etc. hampered expenditure and programme and project activities. The TA expenses however was disrupted only twice during implementation and the expenditure rate was pretty consistent. Looking at the expenditure rate of both budgets it can be concluded that the correlation between the operational budget (MCT) and the TA budget do not correspond, with TA activities not being efficiently aligned with the spending of funds going through MCT.

### 3.4.1. Budget Implementation

The MCT expenditure on the yearly basis reveals: (i) inefficient planning, and (ii) low rates of expenditure.

MCT Expenditure	2010	2011	2012	2013	2014
Real Expenditure :	924,766	1,393,534	2,077,620	1,722,000	1,418,718
Planned Budget:	2,326,000	4,509,000	6,446,747	5,134,834	1,582,378
%	40%	31%	32%	34%	90%



Planned expenditure was off target almost every year, revealing low capacity to organize activities and budget. It was not clear why this happened in a recurrent way every year; lack of skills or expertise at the MCT and lack of initiative from the TA component to adjust planning to real expenditure, could have been the reasons of these discrepancies.

Expenditure was the highest at the beginning and at the end of the implementing period. At the beginning probably showing the enthusiasm of a “new beginning” with STIFIMO and, at the end, working with pressure to increase expenditure.

This budget performance displayed by the MCT, and to certain degree by the TA component, was low and with poor rates of efficiency managing the budget. The fact that the Mozambique population was denied the receipt of an additional 50% of funds to decrease poverty is by all means a bad result.

### 3.4.2. At the Component level

At the component level the performance is similar to that one presented in the overall budget implementation:

**Table 11. Expenditure & Budget on Component level in Phases I and II**

Phase I	Component 1	Component 2	
<b>Total expenditure</b>	1,550,000	1,358,000	
<b>Total budget</b>	3,759,000	3,508,000	
<b>%</b>	41	39	
Phase II	Component 1	Component 2	Component 3
<b>Total expenditure</b>	2,139,000	577,000	499,000
<b>Total budget</b>	5,675,000	3,121,000	661,000
<b>%</b>	38	18	75

Under Phase I (PD1) disbursement rates were low but slightly higher than Phase II (PD 2). Although in absolute terms PD1 and PD2 are not comparable, in relative terms the rate of performance indicates that PD2 was not able to improve spending despite all the efforts made under the reform process. This was particularly acute in Component 2 of the PD2 where the rate of expenditure only reached 18% of the planned budget. Component 3 presents a particular case. Spending was realized up to the last minute allowable (no spending before 3 months to conclusion, GoF contracting rules.) when actual payment took place even before execution.

### 3.4.3. At the project level

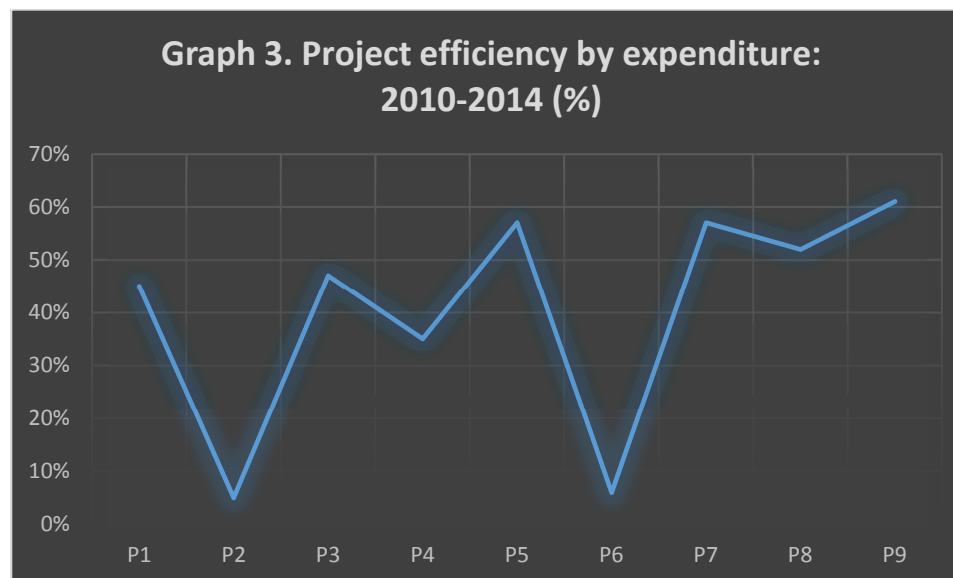
**Table 12. Projects planned and actual expenditure**

Projects	Total €000	Budget €000	%
P1: Development of the capacity of young Mozambicans to use ICT	<b>938.623</b>	2105.58	45%
P2: Expansion and application of research in water to strengthen the science and technology system	<b>11.901</b>	238.02	5%
P3: Implementation of the national biotechnology program - phase I	<b>775.987</b>	1651.036	47%
P4: Institutional capacity building of the centre for research and development in ethnobotany	<b>117.05</b>	334.428	35%
P5: Technology transfer for rural development	<b>295.652</b>	520.459	57%

P6: Financing mechanisms for science, technology and innovation	<b>124.556</b>	2075.933	6%
P7: Science, technology and innovation for SMEs	<b>452.103</b>	793.163	57%
P8: STI system: capacity and institutional framework	<b>308.161</b>	592.617	52%
P9: Human resource development in the science and technology system	<b>190.453</b>	312.218	61%
Pilot projects	<b>0</b>		
Management	<b>745.792</b>	1222.609	61%
<b>TOTAL EXPENDITURE 2012 – 2014</b>	<b>3960.278</b>	<b>9846.063</b>	<b>40%</b>

Of the projects above, P1 can point to a series of positive results through Hackathons and P7, through the National Business Plan Competition, support to incubators, training of support staff and entrepreneurs. It was handicapped by the slow procurement procedure and so ran fewer events than planned. However, the team did interview successful entrepreneurs, who had benefitted from STIFIMO, and were going on to develop other support activities for other entrepreneurs, a genuine sign of legacy and sustainability. This may also be the case for P5, but on site verification could not be carried out.

Unfortunately, P3 and P4, which also show significant expenditure, cannot show the same results. Laboratories have been equipped, and the biotechnology ones at UEM are functioning, but those planned elsewhere have not got to final stage. The laboratories at CIDE have been equipped but are not in use because of staff shortages. The Centre may also move because of problems of electricity and water supply. Even with P1, the CPRD planned for Manica, which should have been functional well before the end of STIFIMO but is still physically incomplete.



On the side of the expenditure rate projects P2 and P6 are the lowest. In the first case the expansion and application of research in water to strengthen the science and technology system did not move

anywhere in a significant way. The same appears to be the situation for the financing mechanisms for science, technology and innovation. It was not possible for the team to find out the real reason for this low activity rate. However, a likely reason is insufficient specialists and overall human capacity to undertake research and even less to develop financial mechanisms for STI.

The projects with highest rate of expenditure: P9 and P7 have also produced some interesting results and P5 has developed and transferred some technology to rural areas. It seems that is possible to establish a correlation between expenditure, rates of execution and results: more expenditure = more activities = more results. The quality and usefulness of some results will be discussed in the next section of this report.

### 3.5. Expected results and realizations

It was difficult to obtain fresh information and visit places where the programme has realized activities in the time available. Thus, this assessment of the results is based on documentation provided, on interviews conducted, and on the information gathered and reported in the MTE. At this time the site visits were limited to see and interview beneficiaries from the MCT, government institutions, and international experts involved in the programme and visits to labs and training centers. These contributions have been used to prepare a ranking valuating the results' contribution to the intermediate and final objectives of the Programme. To prepare this ranking the following criteria have been used: contribution to employment, to production, productivity, knowledge (transfer and education), institutional strengthening and innovation.

The ranking should be considered as a reference and as a way to establish a correlation with project execution and rate of performance. The closer is the correlation, the stronger will be the consistency of the result. Although this may be considered as a subjective tool, its purpose is to present a synthetic measure of the results obtained in the implementation period.

The following table presents the expected, actual results and its ranking:

**Table 13. Expected and actual results/activities 2012-2014**

<b>PD2 Expected results</b>	<b>Results</b>	<b>Rank 5 (Highest)</b>
1.1 10,000 young people and civil servants trained in relevant ICT skills	More than 10 000 young people trained in IT. Approximately 45% of the trainees were female. Training took place in various provinces.	<b>3.5</b>
	6000 technicians participated in IT training activities in various provinces.	<b>2</b>
	Future scientist program, establishing 10 clubs for 1000 students trained throughout the country in 2013. In 2014 program focused on IT education. Final national level competition event and the Scientific Olympics Ten provincial winner and 34 students took part in the final event at Maluana Science Park.	<b>2</b>
	Kids Club integrated with the Future Scientist Program.	<b>2</b>
	Innovators Program in 2013 resulted in 10 new inventions. 38 tech trained and 3 inventions chosen for funding.	<b>2</b>
1.2 Improved communication, coordination and financial management within the ICT sector	7 Hackathon events organized in 2013-2014. 339 persons trained including 61 women and 66 teams established.	<b>2</b>
	AppCampus Ambassadors held in Finland. Two trained in the AppCampus concept. A Windows Application Acceleration Campus held in Maputo.	<b>2</b>
1.3 Application of ICT for rural development expanded	3 new CMCs built equipped and made operational (in Moma, Tsangano and Mecuburi). The CMC in Machava was changed to a telecentro concept. For the CMC in Mogincual STIFIMO financed the rehabilitation of the building (World Bank and project MEGCIP financed the rest.) The CMCs in Lugela and Magoé were rehabilitated and equipped. The activity Development of District Portals resulted a portal being created in Namaacha.	<b>3</b>
1.4 STI services based on ICTs that serve research in place and in use	STIFIMO covered the salaries of three MoRENET technicians. MoRENET supported activity resulted in the establishment of 3 nodes (Maluana Science Park, Unilurio-Niassa and CITTAU).	<b>2</b>
1.5 Access to and use of ICT services and resources among public sector institutions improved	5 MCT technicians, 80 young people and 60 other government officials trained in Maputo province. The construction of the Manica CPRD started in 2012.	<b>1</b>
<b>P1 Total Rank</b>		<b>2.25</b>
<b>P2</b>		
2.1 Improved communication, coordination and financial management within the water sector	Water talks to include installation of a system at CITTAU for monitoring soil humidity for use in water irrigation, and a bio-digester to lessen the contamination of the Umbeluzi River.	<b>1</b>

	A large part of the coordination was realized by DIIDT	<b>2</b>
	Improved communication and coordination in water sector achieved including internal and external contacts	<b>2</b>
2.2 National plan and plan for Central Region for the development of the water sector through STI are in place	N.A.	0
<b>P2 Total Rank</b>		<b>1.75</b>
P3		
3.1 Capacity to deliver high-quality research is improved	Experimental unit for Artemia established at the Matola Marineculture Station. Technical support for implementation of this technology at sea salt works to support aquaculture in the region.	<b>1</b>
3.2 Human resource base in biotechnology strengthened	Growth chambers and greenhouses reconditioned, equipment and reagents purchased. Technical training carried out and protocols for tissue culture optimized. Capability for local research, demonstration and transfer of technology on micro propagation developed: technical support for implementation of this technology provided. Training for laboratory handling tissue culture and application of protocols for particular crops. Facilities improved at the Biotechnology Centre at UEM to enhance capacity for masters and PHD in biotechnology. Rehab of the Biotechnology Laboratory.	<b>1.75</b>
3.3 Enhanced domestic and international collaboration - 3 events organized	Workshop held with stakeholders from the Marine Biotechnology Collaboration with research institutions and higher education, in particular through the implementation of pilot projects. Results from seminar: spread of knowledge, opportunities of collaboration, networking, follow-up meetings and workshops.	<b>2</b>
3.4 Improved infrastructure for biotechnology research	Design for the installation Lab Maluana. The Lab will incorporate platforms for genomics & molecular biology.	<b>1</b>
	The architectural design of the project of the National Centre of Biotechnology and Biosciences.	<b>0.5</b>
<b>P3 Total Rank</b>		<b>1.3</b>
P4		
4.1 Improved infrastructure for ethnobotany research	Improvements of the infrastructure for ethnobotany CIDE installations renovated.	<b>1</b>
4.2 Improved sustainability of CIDE	Training provided to staff accessing and using funds.	<b>1</b>
4.3. Capacity to deliver high-quality research is improved 4.4 Improved capacity in CIDE	Ethnobotany products improved, coordination with the UEM to have the second edition of the National Nutritional Table. Trip to Sofala to collect food samples and conduct nutritional surveys. 50 samples of patterns of various ethnobotany nutritional products analyzed. Incidences of phosphorus, nitrogen, sodium, potassium, calcium and magnesium in 46 samples evaluated.	<b>1</b>
<b>P4 Total Rank</b>		<b>1.1</b>
P5		

5.1 Capacity for agricultural production & processing strengthened in pilot communities - 6 projects implemented	Agricultural products processing centers established at Ribaué and Chibuto. Training and capacity building provided for 14 female and 6 male entrepreneurs on management of agri-business Maputo.	2
5.2 Capacity to design and manage technology transfer programs improved in Millennium Villages and CRCTs	Developed business plan for the Centre of Technology Transfers for Human Development (CTTDH). Training of Local Development Committees of the MVs on the basic principles of management planning, and the general concepts of the MV approach. 156 participants (74 females) benefitted from training. A procedural manual developed. Establishment of a procedural model for fish farming in areas distant from rivers or the sea to support new methods for income generation and improved nutrition. Establishment of six fish tanks in the provinces on Nampula and Gaza. Locals trained on the techniques of fish farming and in small business development.	2
5.3 Improved communication, coordination and financial management in the technology transfer sector	A system of communication established between different actors in the area of technology transfer for community development	2.5
	A proposal for the development of a network of actors developed, approved and appropriated in the area of community development, based on research and transfer of technology in all three regions.	3
	A manual of best practices on community development based on research, technology transfer and innovation elaborated. It includes guidance on disseminating appropriate technologies to communities	2
5.4 Plans to augment agricultural production and livestock processing through TT are in place	A CTTDH at Chagalane established to focus on training in sustainable small-scale agriculture.	2
	Demonstration fields established at Itoculo to promote increased production. A 10-hectare area developed to demonstrate intensive agricultural production	2
5.5 Support mechanisms for grassroots innovations are strengthened and functioning via Programa Inovador	Programa Inovador Mozambicano realized.	2
<b>P5 Total Rank</b>		<b>2.3</b>
<b>P6</b>		
6.1 Research and technology transfer stimulated through financing collaborative projects - 40 projects financed	Collaborative research projects with neighboring countries. Ten projects with South African researchers supported.	1
	Capacity building for the wider research community on how to do research supported. Seminars held to instructed researchers on how to deal with the FNI (access to funding, reporting requirements etc.). Capacity building for the FNI staff through training at some institutions	1.5
	Support to establishment of the causal relationship between R&D and socio-economic well-being as an important justification for state financing of R&D in the country.	1.5



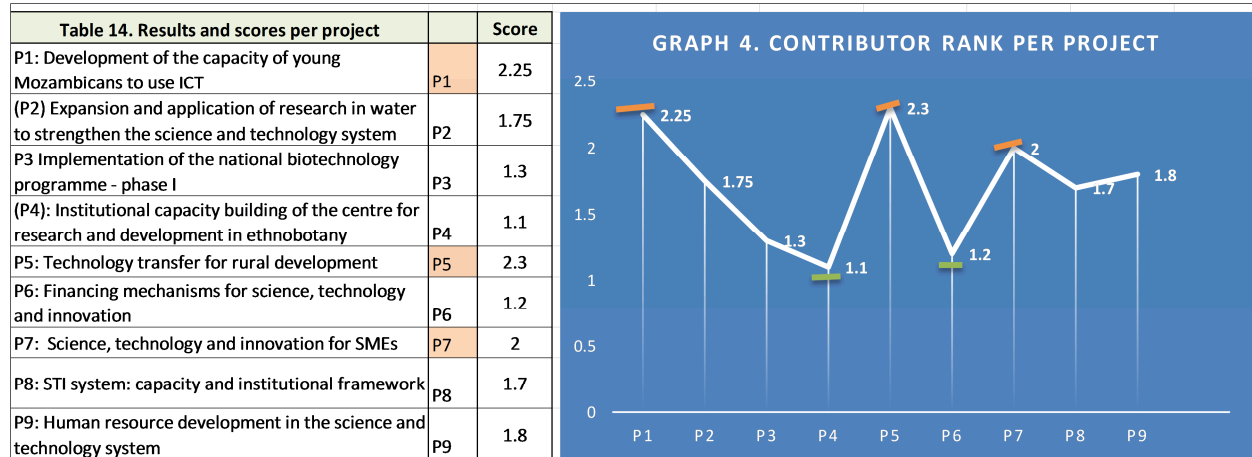
6.2 Science and technology- based product / service / process development and improvement in SMEs is expanded - 50 projects funded	Data collection begun and the outline for the instrument was defined. Contacts were made with potential SME associations, SMEs, SME financial institutions, and other relevant state organizations.	<b>1.5</b>
<b>P6 Total Rank</b>		<b>1.1</b>
<b>P7</b>		
7.1 MCT capacity to promote science and technology- based innovation in private sector is strengthened	Networking with four institutions in Nampula, four in Beira and 11 links between the MCT and the higher education institutions.	<b>2.5</b>
	DIIDT staff participated in various conferences.	<b>1</b>
	The Out of the Box business idea competition. Workshops held for competitors focused on business idea development and planning.	<b>1</b>
	10 workshops held in Beira, Tete, Nampula and Maputoa. A total 225 participants (25 %) female participated.	<b>2</b>
	About 600 people registered on the website to participate. Some 180 business proposals received and 15 finalists selected to additional training. The top three business ideas awarded 25 000 euros, 12 500 euros and 6 250 euros.	<b>3</b>
7.2 Innovation system concepts are integrated in key STI institutions	Launching of the Mozambique Technology Program, to enhance STI capacity.	<b>2</b>
	An online platform created to interact with different stakeholders	<b>2</b>
	Information dissemination seminars held in Quelimane and Chimioio with 70 participant representing various stakeholder groups (universities, companies etc.)	<b>2</b>
	Visits to Portugal and Brazil to identify international partners. The visits resulted in internship vacancies for students.	<b>2.5</b>
	The second national seminar held, where cooperation memoranda e signed between the MCT and CTA - the Confederation of Mozambique Economic Associations and between MCT and AEFUM - the Association of Mozambican student Finalists.	<b>1</b>
	Internship for 1062 students, of which 198 received permanent jobs. In 2013 were 1286 internships, of which 182 got permanent jobs.	<b>2.25</b>
7.3 Maputo Innovation Space established comprising: Science Pre-Incubator (10 ideas) and Mini-incubator (5-7 start-ups) and Innovation Lab (50+ new/improved products, SMEs), 25 events hosted	The MCT established partnership with the IT Centre of UEM and iCamp, to set up the Innovation space. The CIUEM and iCamp will support the installation of electricity and Internet facility.	<b>2</b>
	A seminar on "start-up ecosystems and how to boost the Mozambican ecosystem" with 60 participants.	<b>2</b>
	The establishment of help centers communities training to find solutions to the local problems. Seven community Champions developed the plan to start training their community neighbors.	<b>2</b>
	A business incubator developed in Nampula in partnership with the University Apolitécnica. STFIMO financed the office equipment, including computers.	<b>2</b>

7.4 Innovation promotion services established in public and private institutions that support SMEs	The dissemination of STI activities through public science fairs (Mostras) realized in 2012, 2013 and 2014.	2.5
<b>P7 Total Rank</b>		<b>2</b>
P8		
8.1 Capacity strengthened within MCT and related institutions 50 individual HRD plans implemented	6 courses organized at the MCT level and 3 courses in the regional Centre of Sciences and Technology (CRCT) on methodology for developing fiscal scenarios. 3 regional training activities.	2
	A conference organized by UNESCO and supported by STIFIMO held on the development of Instruments for Monitoring and Evaluation of STI Policies and Political Instruments. A total of 105 public servants, of which 42 were women trained.	2
	To improve the coordination between MCT central and regional & provincial levels, annual planning meetings	1
	Support the MCTs coordinating Council in Nampula. Review of the actions realized under the Governments 5-year Plan presented and follow-up plan for the remaining period of the 5 year strategy made.	1
	The MCT's internal capacity strengthened. Management training for focal points in administration and finances held. 43 individuals received training, out of which 21 were women.	2.5
	Establishment of a monitoring, evaluation and learning (MEL) unit. Drafted the MEL Plan.	2
	Training session for DPEC staff and focal points for planning in other ministerial departments to equip the MCT staff with knowledge and expertise to be able to conduct their own planning, monitoring, evaluation and reporting.	2
	Monitoring of MCT activities in Sofala, Manica, Tete, Zambézia, Nampula, Cabo Delgado and Niassa provinces, with focus on STIFIMO funded activities.	2
NPC and three staff members of DPEC participated in a week-long MEL course in South Africa. STIFIMO financial support to the development of the MEL capacity in DPEC	2	
8.2 MCT's institutional capacity strengthened in key areas: STI indicators and policy-making, program management and ME&L	Merged partially with outcome 8.1 and partially with outcome 8.3. Support the organization of meetings to develop and assess the fiscal scenario.	1
8.3 Policy framework improved	Law of Science and Technology prepared. Submitted to the Council of Ministers for approval.	2.5
	Publishing a booklet of internally collected STI indicators. This was done in agreement with the New Partnership for African Development (NEPAD) reporting requirements.	2
<b>P8 Total Rank</b>		<b>1.7</b>
P9		

9.1 S&T master plan aligned with the needs of strategic sectors	Updated strategic plan for the development of S&T human resources (HR) in the Mozambican economy. Data collection study carried out. The strategy is expected to be approved by the Council of Ministers and Parliament.	2
9.2 Education and training sectors understand and agree to master plan	No major activities implemented.	0
9.3 Directorate for Development of Human Resources for Science and Technology strengthened	Staffing plans have been developed and posts defined. The national strategy includes the development of the Directorate.	3
9.4 Number students benefiting from scholarships increased	200 scholarship applications supported	2
9.5 Domestic and international linkages strengthened	40-60 beneficiaries supported	2
<b>P9 Total Rank</b>		<b>1.8</b>

### 3.5.1. Successful projects and activities

Using the evaluation criteria a project ranking was possible to prepare. The summary of these results is presented in the following scoring table and chart.



From the above information it can be concluded that the projects with the highest probability to contribute to the objectives of the programme are projects 1, 5 and 7. Activities related to education of young professionals, technology transfer to rural development and support to the innovation of SMEs, appear to have influenced the most. In the case of education the variety of activities in training, seminars, organizing events, and the fact that these were implemented in several regions of the country for mostly youngsters was effective. Similarly, practical issues related to water, sanitation, food production and practicing with alternative seeds and or crops was highly appreciated by the local population. Supporting SMEs capacity to innovate through TA, demonstrative cases and fomenting knowledge competitions and alike was attractive for businesses and for young entrepreneurs.

Looking at all projects and activities more in detail there are specific sectors/areas where STIFIMO did achieve a number of targets and contributed to development in Mozambique. These were most notable in ICT, where the programme had antecedent activities but did encompass other areas. The final evaluation team could only verify a small proportion of these. However, drawing on the MTE, the final report and interviews with participants (in all roles), the results set out below have a reliable base.

#### ICT

- Over 10,000 people were trained in ICT, of whom 45% were female. Training included web design, basic office and computer maintenance.
- New approaches were introduced with success. These included Kids Clubs and seven Hackathons, with 339 participants (of whom 61 were women – there was one women only Hackathon) and forming 66 teams. Some of the participants have gone on to establish their own enterprises and these include the founders of IDEARIO, a self-sustaining hub for the sector.
- Two Mozambicans were sent to AppCampus Ambassadors in Finland in 2014, with the intention that they will train other Mozambicans. This impact can be confirmed by the evaluation team. A Windows Application Acceleration Campus events subsequently was held in Maputo.

- Three Community Multi-Media Centres were established and others supported. These CMCs bring computer and communication literacy to the rural areas. They combine this training and application with community radio, which brings entertainment together with messages on health and agricultural and dietary improvements to the poorest sectors of society.
- The Mozambique Research and Education Network (MoRENet) was strengthened and extended through telecommunication.

### **Enterprise and scientific training**

- The programme Scientists of Tomorrow trained more than 1000 students. In 2014 this focused on ICT and encompassed all ten provinces of Mozambique, with 44 in the final Scientific Olympics.
- The Business Idea Competition had 225 participants. This was strongly linked to ICT developments and helped to provide a critical impetus to these developments.
- The Mozambique Technological Program found 2500 internships in private companies, which resulted in 385 permanent posts.
- Training in intellectual property rights was delivered to grass roots innovators in Zambezia province.
- Training was delivered to 30 fisherman on use of fishing cages and 96 agricultural producers were trained in use of machinery. Further training was given to MCT technicians, young people and other officials (145 in total).

### **Strengthening STI**

- Feasibility studies for incubators in three locations were undertaken and one was established at the Polytechnic University of Nampula.
- A series of developments were undertaken at Chibuto Millenium Village. These included a moringa processing unit, equipment for making bricks and associated training, which also involved crop selection and marketing.
- FNI allocated support to joint research projects with Zambia and South Africa.
- The biotechnology laboratories at UEM were upgraded and put to use.
- The Innovators Program in 2013 resulted in 10 inventions identified and three chosen for FNI support.
- Of the seven Hackathons, three focused on applications in natural disasters, tourism and water and sanitation. The aim was to combine scientific disciplines to produce innovations of application in Mozambique.
- There were also a number of rural development activities in progress at the end of STIFIMO, to which the programme contributed, but final impacts will have to be awaited.

#### **3.5.2. Critical projects**

In the assessment it was also possible to identify projects that were not so successful from the implementation and results point of view. These projects with lower probabilities to succeed are projects 4 and 6. In the first case supporting institutional capacity in the ethnobotany sector improving infrastructure and lab equipment was not the best thing to do. Ethnobotany is a niche that is still in its incubation phase with modest results achieved, underfunded and under staff. It was reported that many

laboratories around the country are poorly equipped and with very little amount of scientists and researchers yielding modest contribution to day to day life of the people.

The other project (P6) is related to the link between financial mechanisms and science and technology. The focus was on R&D on the one hand and on process, product and services. The amount of business that can have access to either component in Mozambique is very limited (less than 100 enterprises probably). R&D integrated into businesses happens in advanced economies, with enough financial resources and with competent human capital. These characteristics are also required to work in products, services and process. Moreover, financial institutions in Mozambique are not ready to develop venture capital alternatives to finance R&D or innovation in production processing or in R&D itself. These can be the reasons that probably have affected the efficiency of this project, developing so few activities with modest results and with no impacts over the population or to the productive sector in Mozambique.

### 3.6. Management and administrative issues.

STIFIMO has had a complex management history. Two different contracting companies, two different implementing modalities and two different PATs were involved. In addition, the supervising board had difficulties functioning properly; the international TA was unable to transfer managerial knowledge; the procurement system applied was not adequate to the needs of the program and the human resources in charge of the programme did not have the experience needed to handle large and complex program like STIFIMO. All these problems were properly identified and documented in the MTE. In this final evaluation it was possible to confirm the findings of the MTE and to gather additional information through interviewing the former “management unit “of the programme.

It was not possible to identify positive changes from PD1 to PD2 in regard to the managing structure. The same team: project coordinator and the financial manager was “absorbed” by the MCT Procurement Unit, adding more bureaucracy, reflected in lower disbursement rates and longer periods for procurement. The MTE noted these delays in procurement and payment that had increased since the new PD was adopted. It also stated that the procedures were straightforward. The recent Audit Report did not find procedures to be deficient. The MTE made some recommendations to improve the processes, which were resisted by MCT as an infringement on their prerogatives. Nevertheless, sometime after the MTE additional staff were recruited to assist in the procurement and payment processes.

In spite of these changes, procurement remained a major hurdle in programme implementation. Six month delays remained common and produced a huge cumulative backlog of work. Time sensitive purchases, such as attendance at conferences or even physical equipping of centers such as Manica CPRD fell off the back of the programme and could not be implemented.

#### - **Procurement issues**

The major constraints related to procurement flow did not change from PD1 to PD2. It was reported that the main problem in both periods was at the Permanent Secretary Cabinet, which was seen as place

where the procurement process gets stalled. Information did not flow quickly from the PS Cabinet back to the procurement instructor and few procurement cases were approved without side or further conversations with the PS. There was insufficient collaboration between the Program Management Unit who initiates procurement process, UGEA team members (Unidade de Gestão de Execução Aquisições) and the cabinet of the Permanent Secretary who has the final word to provide clearance to procurement processes. This system was inefficient and too slow to execute activities.

It was reported that from some of the project coordinators perspectives, the issue was not accuracy nor mistakes in instructing procurement files, but lack of interest and transparency from the PS Cabinet who had the role and authority to provide the go ahead. During the interview process, project coordinators indicated that there were bottlenecks in authorization of procurement. The PS Cabinet was considered as holding up several processes with no clear reason. Lack of adequate information sharing and communication among the procurement personnel have also been reported. The evaluation team could not track down and reconstruct the engineering process of procurement and financing with specific examples. No dossiers were available to be reviewed but the cases described in the MTE are still valid and were reported as pretty much the same in the second period. In fact, in the second period the recommendation to compile a procurement plan for the eligible activities for the remaining period of the grant, and work on implementation of systemic set of procurement needs instead of procure one product/subject or service at time, was not followed. The implementation task team did not play the decision making role suggested to speed up implementation process.

- **The role of the Steering Committee and Supervisory Board**

The Steering Committee (SC) and Supervisory Board (SVB) performed less than expected. Perhaps the biggest problem was the lack of motivation to supervise and monitor project implementation and the inefficiencies shown in the decision making process.

The Steering Committee (SC) was responsible for providing strategic governance and coordination of STIFIMO. It did not fulfill this role effectively. This was the case especially in the first period where the SC was composed of around 25 members. Difficulties to attend meetings and to reach common decision were reported to be a problem. In the second period the SC was reduced to five specified members (three from MCT, one from TA and one from EoF) with additional invitees, and supervision improved. Nevertheless the inefficiencies persisted and the control over budget expenditure or procurement worsened.

The Supervisory Board (SVB) consisted of two representatives, one from MCT and one from the MFA (effectively from EoF). Major decisions that needed to be taken jointly by the two governments concerning STIFIMO were be done by the SVB on the basis of consensus. It is difficult to understand how the SVB paid no attention to the periodic reports produced by the TA and National Project Coordinator where several times problems were described. An early action and more control and intervention could have helped to prevent deviations or minimize problems. Following the MTE, it is understood that meetings became acrimonious and consensus could not be achieved.

### **3.7. Other factors hampering and aiding implementation**

The main factor aiding implementation was the enthusiasm and commitment of Mozambican middle level officials and TA members, when these coincided. Both had to move beyond their strict terms of reference. TA did more than advice and got involved in managing events and activities and

Mozambicans persisted in getting things through the system and giving the STIFIMO activities a priority over other ones.

Lower cultural barriers in the areas of ICT, entrepreneurship and science may have assisted such co-working, but interpersonal skills may have been predominant.

Among factors hindering implementation the misunderstanding of the nature of the programme and Finnish assistance must rank very high. It is clear from interviews and records, that MCT regarded STIFIMO as one element in its implementation of MOSTIS. However, this was not MOSTIS as written, it was building up the basic institutions to enable MOSTIS to function. MCT really wanted budget assistance, not an innovation support programme.

The second factor is that MOSTIS as written is not a description of the situation in Mozambique, but a description of the situation after the desired institutions are set up and functioning. It is not a sound source document.

The third factor is that MCT is a young institution in a least developed country and lacks capacity to implement such a programme. It is understaffed by 50%. It has competing internal power structures and administrative skills are not high.

The fourth factor hindering implementation is that neither PD took account of the above circumstances. As a result a programme was designed, which was not appropriate to the circumstances.

#### 4. Answers to the Evaluation Questions

In this section a response is provided to the main evaluation questions guiding the assessment.

<b>Relevance</b>
<ul style="list-style-type: none"> <li>• <b><i>Was STIFIMO relevant to Mozambique's needs in science, technology and innovation?</i></b></li> </ul>
SITIFIMO was not properly designed and its relevance was undermined by insufficient understanding of the economic, political, cultural and institutional knowledge of Mozambique in general and in particular in reference to the STI Sector.
Mozambique needs and priorities to boost the economy and reduce poverty are different from developing science, communication and innovation. The country required at that time (2009) (and still requires now) support to the rural and agricultural sectors in particular (75% live in rural areas) , assistance to basic education (illiteracy affects half the population), and additional aid to improve health and infrastructure services are still to be developed (low indexes per capita). These issues are keeping the country amongst the poorest of the world.
STIFIMO did not take into account the basic requirements needed to implement STI programmes: higher education, good productive base, solid institutional capacity, and a market structure where supply and demand motivates R&D and innovation activities, products and services.
The strategy and approach selected, top down favouring the supply side, did not work. As the international experience shows, at this level of development, supporting basic production, food processing activities, basic industry and manufacturing are usually more effective tools to stimulate



innovation than strengthening institutions without connection to productive activities.

<b>Efficiency</b>
<ul style="list-style-type: none"> <li><b><i>How well did STIFIMO activities transform the available resources into the intended outputs/results, in terms of quantity, quality and time?</i></b></li> </ul>
<p>STIFIMO has encountered a number of problems affecting its efficiency. The continuous disruptions from its original plan and conception to the weak presence of qualified human resources have influenced its capacity to transform the available resources into the required output/results, both from quality and quantity point of views.</p>
<ul style="list-style-type: none"> <li><b><i>Quality and role of technical assistance (both teams) and the backstopping. What hindered/enhanced the efficient use of the international technical assistance?</i></b></li> </ul>
<p>The TA quality has not received great marks, although some contributions were made with specific and isolated activities, overall poor performance and inefficiencies were attributed to both teams.</p>
<p>The TA teams did not have the experience or enough knowledge about Mozambique's culture and about the socio-economic reality or about the human and institutional capacity to affront STI challenges. The capacity to respond and improvise efficiently to unexpected events coming from institutions, regions, persons or administrative systems, for example, was not displayed by TA experts.</p>
<p>A qualified and experienced team both in STI and working in South African countries could have been a mitigation factor to the conceptual, planning and institutional weakness exposed by STIFIMO.</p>
<ul style="list-style-type: none"> <li><b><i>Were the risks identified in the project document adequately managed in STIFIMO?</i></b></li> </ul>
<p>Proper ex-ante institutional and human capacity assessment would have contributed to minimize any kind of risk. The implementation of STIFIMO activities and the disbursement of resources should have been subject to conditionality, for example, yearly achievements and rates of performance, presentation of concrete and measurable results, i.e. pilot schemes, models, products, process, etc.</p>

<b>Development effectiveness</b>
<p><b><i>To what extent did STIFIMO achieve its purpose?</i></b></p>
<p>The overall purpose of STIFIMO was to have an enhanced national science, technology and innovation system in place, which contributes effectively to economic growth and poverty alleviation. Mozambique does not have a national science system, which contributes to economic growth and poverty alleviation. It did not have an effective system to be enhanced when STIFIMO started. While there are some lasting benefits (see below) there has been no noticeable systematic improvement, although improved indicators and monitoring may now be implemented at MCT.</p>
<p><b><i>Did the results/outputs and the Project purpose make a contribution towards reducing poverty and inequality, promoting women's empowerment and promoting sustainable development?</i></b></p>

STIFIMO has had some effects, which are contributing to economic growth. There are enterprises arising out of the business plan competition and the Hackathons. ICT skills have grown among a section of the population. 45% of the 10,000 trained in ICT were women (still a minority). Incubation activities are starting on a sustainable Mozambican basis. There is evidence of rural improvement in CMCs and at least one Millenium Village. CMCs do make an impact in reducing poverty and inequality through access to ICT in rural areas and through broadcasting on matters of health and agriculture, which have an impact on women's positions and sustainability in rural areas. STIFIMO was responsible for the development of a three CMCs to add to a network of over 40.

#### Aid effectiveness

##### Ownership

***Did the existence of Stifimo help MCT to negotiate additional funding and has MCT's share of the State budget increased (either in nominal or proportional terms)?***

There is no evidence of increased funding or state budget as a result of STIFIMO.

##### Use of country's own institutions and systems

***How were risks of using country systems identified and mitigated? (at the formulation phase and during the implementation)***

The risks of using country systems were not identified during formulation, which is a major failure, given available evidence from other states at the least developed level. They were noted strongly during the Inception Period. The revised formulation of the Programme Document noted the risks in procurement and finance and indicated that extra resources would be available to assist MCT, but made no other provision for mitigating the risks. These extra staff resources were not realised until sometime after the MTE and then with mediocre (but some) results. The revised PD centralised processes on the MCT's systems, which did not respond to the demands placed on them. The TA repeatedly noted the difficulties and delays in using country systems, but were unable to mitigate the delays and failures to procure and pay for equipment and events.

##### Capacity development

***Did Stifimo succeed in building capacities within MCT and the institutions it worked with?***

Staff interviewed reported learning and greater knowledge and expertise. MCT is adopting some of the indicators proposed through STIFIMO for monitoring STI. However, there is no profound change in capacity in what is a small ministry and benefits to other institutions must be at the individual level. The final report of STIFIMO indicated that capacity remained the main deficit of MCT and the principal reason it could not implement adequately the projects supported by STIFIMO.

##### Managing for results

***Did the partner institution establish results-oriented reporting and assessment frameworks with a manageable number of indicators?***

No.

***Did STIFIMO develop capacity and demand for results-based management? Is there an***

<b><i>understanding within the partner organization about RBM?</i></b>
Some individuals have increased knowledge and expertise, which should not be neglected. They manifest a demand for RBM, and this is realised in the Planning Directorate (DPEC). However, it would be incorrect to state that there is an understanding about RBM at the highest decision making levels. Although staffing has now changed (after the end of STIFIMO), presentations and training on monitoring and evaluation and indicators (essential elements of RBM) were repeatedly postponed by higher level staff and were not accorded a high priority. It has not been possible to determine the level of understanding of the new staff outside the Planning Directorate. However they have not been party to discussions on this matter.
<b>Crosscutting issues</b>
<b><i>- To what extend crosscutting issues were taken into account in STIFIMO?</i></b>
Crosscutting issues are given special status within development policy because without special attention the issues are often left out of the agenda or with too little attention. Some of the results explained above acknowledge their existence especially with regards to gender and ecological practices in rural areas. No specific policies or activities or budget were allocated to address crosscutting components. There were not concerns expressed in the design or contextual analysis performed, in order to recognize which issues and in which element of the programme they would be expected to be beneficial.

## 5. Conclusions and lessons learned

### 5.1. Main Conclusions. MFA intervention process in the programme

This section examines the development of STIFIMO in the light of current MFA guidelines. The purpose is to provide guidance and recommendations for the future. Examining discarded or superseded processes would not do this. The starting point is the Manual for Bilateral Programs published in 2012. The Manual consists of two parts. Part I focuses on the guiding principles for program planning, design and implementation processes. Part II deals with the project cycle to completion.

#### **Conceptualization of Programmes**

Poverty reduction and achievement of Millennium Development Goals and are the global objectives of policy.

The move towards Program Based Approaches (PBAs) is seen as a major paradigm shift in aid delivery. According to the OECD definition, PBAs have the following characteristics:

- (i) Leadership by the partner country
- (ii) A single, comprehensive program and budget framework
- (iii) A formalized process for donor coordination, and harmonized procedures for reporting, budgeting, financial management and procurement
- (iv) Efforts to increase the use of country systems for program design and implementation, financial management, monitoring and evaluation.

In order to optimize impact and make use of Finland's special expertise, it is important to identify which other donors are supporting the country to identify potential for cooperation and relevant niches for the Finnish support.

Country strategies are seen as the basis for Finnish support and form the basis for Programs in no more than three sectors. The current Finland – Mozambique programme was formulated after the start of STIFIMO and so cannot be used for this purpose.

However, in the middle of the last decade, Finland had become recognized as a world leader in innovation policy and practice. It thus became source of study for other developed countries and less developed countries. Reasonably this aspect entered the MFA portfolio of assistance measures. Initial Programmes such as COFISA in South Africa and later the Innovation Partnership Programme (IPP) in Vietnam were positively evaluated and thus provided a basis for further development in line with the stipulation of the Manual about priorities in 'sectors or topics in which Finland has relatively strong know how and previous experience.'

It was in the above context in 2008 that the Mozambican Government approached Finland with an advanced project idea: "Concept Paper for Bilateral Cooperation between Finland and Mozambique in the Area of Science, Technology and Innovation". This is in line with the procedures outlined. This well presented 15 page document took into account the requirements of the PBA above and set out a program to follow.

Current procedure would require an identification process, which would involve an Identification Report including concept notes of the relevant project alternatives, normally 10-20 pages. The Manual states, 'It is important that the project alternatives are carefully reviewed with the partner(s) thus providing solid base for further planning and cooperation.' The Identification Report includes analyses of country situation and institutional framework. It is the task of the MFA Regional Department to carry detailed analyses of strategies and background assessments.

The team has not been able to find documents relating to this procedure in the case of STIFIMO. It appears that the Concept Note presented was used as the basis for determining the ToR for producing the Programme Document. Several phrases and diagrams are common to both the Concept Note and ToR. The consultant thus undertook the design of the Programme Document, without these checks having been undertaken. S/he proceeded on the basis that documents such as the Concept Note and MOSTIS were good evidence.

### **Programme design**

In line with the Paris Declaration, it is regarded that Programmes should have strong country ownership 'by a broad range of actors and stakeholders.' The use of partner countries own administrative systems is emphasized, but the donor is not to be a passive observer.

The guiding principle for the Finnish cooperation is that partner country's own systems are always applied and used if not specifically agreed otherwise. However, before deciding to what extent it is feasible to use the country systems, an assessment has to be carried out on their adequacy and on the overall administrative capacity of the partner organization. These assessments should cover the following aspects:

- (i) Administrative capabilities and mechanisms,
- (ii) Budget and financial management,
- (iii) Reporting,
- (iv) Audit,
- (v) Procurement practices.

In making these assessments the Manual states that it is advisable to use the existing and joint analyses with other donors rather than making separate own assessments of the situation. The assessments do not result in a simple Yes/No decision. They may indicate a need to strengthen the partner's administrative capacity. Use of the partner country's own systems carries a risk, which needs to be recognized with maximum clarity by both parties.

At no stage, were the above assessments carried out. It does not appear to have been the role of the formulator of either PD to make these checks. While this is less surprising in the case of the first PD, it is more so for the 2nd PD, when so much evidence existed from PAT feedback and low expenditure that there were capacity problems. In agreeing to a revised PD, a review of progress should have raised these points and they could have been confronted at that time.

Finland envisages harmonization with other donors through:

- Joint analysis of the political, economic, social and environmental situation;
- Encouraging the selection/nomination of a lead donor, with the responsibility for coordination, in each priority sector;

- Focusing on areas where Finnish expertise and experience can be best used.

In the case of MCT, there were three other main donors: World Bank, SIDA and GIZ. While there were some informal relations among these donors, there appears to be have been no joint analysis or selection of a lead donor to maintain liaison. What did occur was MCT organizing donor liaison meetings on their premises at six monthly intervals, which is a credit for them. World Bank and SIDA focused on funding research projects and training of individuals, GIZ on building, leaving Finland to actually focus on its area of expertise: innovation. However this appears to be by default.

Project Cycle Management (PCM) is the concern of Part II of the Manual. PCM is conceived of as a learning process, which includes:

- Continuous planning throughout the phases of the project cycle;
- A system that feeds lessons learned into planning for improvements and changes;
- A clear decision-making system that approves changes to plans;
- The project document as a basis for work planning, monitoring and evaluation;
- Establishment of baseline data for assessing progress.

The above is an ideal, which should be aspired to. The programme had a Steering Committee and a Supervisory Board, both of which were simplified in the 2nd PD. This was fine, but the structure did not function effectively because of the different interpretations of the program by MCT and MFA. Hence there was little ability to learn lessons because each party was pursuing a different course. This undermined the whole process.

### **Factors to be considered**

OECD has established criteria for evaluating development programmes. Some of these can be applied 'ex ante.' The most relevant of these is 'Relevance,' which asks the following questions:

- To what extent are the objectives of the program valid?
- Are the activities and outputs consistent with attainment of objectives and impacts?

Moreover, the criterion of sustainability can be strongly influenced by existing policies and social and economic trends, which should be evident at the time of formulation. The Manual deals with sustainability in different aspects: economic, financial, environmental and technical.

The other criteria of effectiveness, efficiency and impact are also important but need to be answered more as a 'walk through' of the program.

STIFIMO fails the basic criterion of relevance. The objectives were not valid and could not be achieved in the time frame set. The lack of adequate analysis of the country situation and the institution involved were fundamental failings.

Program appraisal is an essential step in the formulation of Programs. Once the PD has been written, it should be appraised by independent experts, who can overview the whole process and all factors. This was not undertaken for STIFIMO and represents missing an important quality and safety check.

### **Risk analysis and response**

The Manual acknowledges that development cooperation takes place in a high risk environment and accepts that risk must be tolerated. Importantly it states that 'Risk assessment is not only an entry level

decision tool but also an essential part of monitoring.' Three types of risk are identified: developmental, financial or fiduciary and reputational. It recognizes, that 'Identifying all the risks in advance is difficult or even impossible and the risk assessment is always partly a subjective judgement based on incomplete information. Therefore, the monitoring and management arrangements must allow timely response and mitigation of both new and previously identified risks.'

Both PDs have sections on assumptions and risks. These are static statements, essentially stating that the risks have been minimized.

- The 1st PD states, 'The fact that the program funds will flow through two channels, i.e. national systems and TA contractor may pose challenges for joint reporting of the program. As such, measures need to be taken in order to mitigate the possible problems.'
- The 2nd PD is more sophisticated in layout; it lays out risk and mitigation in two columns. The latter is more detailed, but all the elements have actually been included in the PD.

<p>Financial management processes function efficiently and effectively</p>	<ul style="list-style-type: none"> <li>• Streamlined financial management functions delegate authorization of expenditures to director level; documented in PD.</li> <li>• Effectiveness of processes reviewed constantly and improved as needed</li> <li>• Changes to financial management processes approved by SC</li> <li>• Instructions for stakeholder must be documented, disseminated and posted on the MCT website</li> </ul>
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Although Risk Management Matrices have become more complicated, the essence is the same. A risk is identified and then minimised by program elements. Things therefore appear to have been done. This is not the case. The programme has been designed and inevitably there will risks including unforeseen ones. The stipulations of the Manual with regard to monitoring and management response are not actually adhered to.

In the case of STIFIMO, the acceptance of high risk might have been valid. The programme had a major product champion, the first Minister; it was a first attempt to use STI to dynamise development from the base; there was a group of people around the Minister wanting to push it forward. It might have been worth the try. But there should have been risk identification and a system of response built into the programme. In terms of innovation, loss of a product champion is usually a calamity and thus time to look elsewhere. However, in this case, there were warning signs long before the Minister went. Expenditure, outputs and internal feedback were all pointing in the direction of failure and hence a rethink. They were not acknowledged.

### 5.2. Recommendations

The current Manual for Bilateral Programs contains procedures, which if followed appropriately, would avoid many of the failings noted in the programming of STIFIMO. This Manual is therefore in general

recommended for its current task. However, there are a number of points, which need emphasis and are set out below.

Project conceptualization and identification should take account of the country's institutional capacity to deliver. The Manual recognizes this, but the need to allocate appropriate time and resources is vital. This can be assessed from a review of literature and other donor experiences, but may also require actual work in the country.

In the Least Developed Countries, the effectiveness of state institutions needs to be assessed before their systems are adopted for delivery. Improvement in their effectiveness and efficiency cannot be assumed to result from technical assistance.

The design process is a response to ToR arising from the identification phase. As this involves work in the country and this is likely to be more extensive than that in identification phase, two allowances should be made:

1. For feedback, which indicates that the concept may not be appropriate;
2. That the delivery modality may be different from that envisaged in view of levels of capacity and development.

Risk analysis must include indicators and contingencies, which can trigger a warning and a response. The process of 'ex ante' risk assessment produces a minimized risk matrix, which gives rise to complacency that risks have been taken into account. This is the exact opposite of what risk management should do and indicators or trigger events should be built into programme results to be monitored.

Assistance in Science, Technology and Innovation for the least developed countries should recognize their levels of development and capacity. The emphasis of actions should be on 'bottom up' interventions involving improvements and adaptations of technologies and practices. These are the most effective way to change attitudes and culture, and so have a tangible effect on poverty reduction.

ICT can have a catalytic effect throughout societies because of the low barriers to entry, the wide range of applications and the appeal to wide sections of young populations. This should continue to be a priority for Finnish programmes.

### 5.3. Lessons Learned

The first lesson to be learned can be summed up by the Latin phrase, 'Caveat Emptor,' or 'Let the buyer beware.'

The 'Concept Paper for Bilateral Cooperation between Finland and Mozambique in the Area of Science, Technology and Innovation' produced by the Government of Mozambique in November 2008 was a sales pitch, which the MFA bought. It was not checked out adequately. It is a very well written document and was produced as part of a programme to gain US\$60 million to support the development of MCT. The Draft Evaluation Report on the ICT Advisor Project produced in January 2012 points out the success of the project in raising this sum for MCT, a sum confirmed by the then Minister and ICT Advisor.



Unfortunately, the picture portraying the STI situation in Mozambique was inaccurate. It is surprising that this was not checked out, as studies of several African and other less developed countries would have shown potential pitfalls to its implementation.

To compound the misfortune, MOSTIS was taken as a reliable source document. This is far more excusable as it is well put together and may have been the first STI strategy document for a least developed African country. Nevertheless, relying on the source document produced by the seller is not prudent buyer behavior.

It should be essential to check out from several sources the appropriateness of the programme to social, economic and technological capacity of the country and the delivery capacity of the partner body. The former can be done through studies of the country and comparable other countries. The latter can be done through similar comparisons, but should also require an actual check on the systems and performance of the body. In this case, MCT staffing levels, budget size and examples of delivery could have been checked – all in the interest of tailoring the best package.

The second lesson to be learned is one of ensuring common understanding of the contract entered into by the respective ministries. MCT and MFA seem to have consistent misunderstandings of the purpose of the programme. This is reported consistently by both the 1st and 2nd PAT. As was indicated to the team in Mozambique, silence often indicates disagreement not agreement (something by no means unique to Mozambique). Overcoming this is more difficult and requires time and slow buildup of activities.

The third lesson to be learned is that of monitoring and evaluation or of quality control to inform risk management. There were three sources of data: expenditure, programme targets and TA feedback. Deficits in all sources were available very early, but were not taken as symptomatic of a major flaw. Here there is a conflict of interest among all involved parties. It is not in the apparent interest of either the recipient, MCT, or the consulting company, NIRAS, to recognise a basic flaw and suspend the programme. It is also awkward for MFA planning procedures.

Current risk matrices are worse than useless, as they present static picture of risk minimization leading to complacency. A risk is presented and action to minimise it follows thus apparently reducing it. It then becomes an annex to a programme document as if the matter is dealt with. It has no management capacity as there is no indicator to trigger action. Hence it cannot be used to manage risk. Quantitative indicators such as expenditure or timetable could be used as could qualitative ones such as feedback from TA.

The fourth lessons relates to a need for institutional capacity assessment. The significant amount of proposed funding merited an investigation of the capacity of the institutions to process and delivery results. This implies sound analysis of the actual capacity to manage and control funds, solid and proven structures and mechanisms accounting expenditure and procurement capacity needed to be reviewed to assure inflows and outflows in a transparent and efficient fashion. No analysis of this kind was conducted to anchor the programme on solid institutional grounds. Yet there are straightforward means to carry out such assessments, which could be included in conceptualization or programming.

Given the institutional weaknesses observed, which appear to be a function of underdevelopment, the time given (5 years) to allocate expenses (22 million Euro) in more than 150 project activities and components, required expertise in a specialized unit to assure timely delivery, to produce sound reports and to prepare accurately monthly plans to be reviewed by the supervising authorities and stakeholders. Patching this essential component with improvised expertise and without proper means to perform undermined project capacity to provide results. This evaluation has heard repeatedly complains about the financial and procurement unit and other donors implementation mechanisms (WB) were mentioned as examples of more dynamic and rigid systems that should have been applied by STIFIMO.

The fifth lesson relates to block allocation of funds over a prolonged period, without performance indicators. It is understandable that such an allocation could be regarded as budget support, giving rise to major misunderstandings. This might be minimized by conditional funding linked to quality control systems, results achieved, procedures and the preparation of dynamic indicators (far different from static forms presented in the logical frames) or rates of performance, efficiency, progress, disbursement, and would allow the conclusion of programed actions before starting new ones.

## **ANNEXES**

Annex 1: People interviewed

Annex 2: Literature reviewed

Annex 3: Policy & Strategy Papers used

Annex 4: STIFIMO Life cycle / time frame

Annex 5: Main Programme Documents used