2017:9

Sida Decentralised Evaluation

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Evaluation of Swedish government research cooperation with Eduardo Mondlane University, Mozambique 2011-2016

Synthesis Report

Sida

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Abbreviations and Acronyms

AfDB	African Development Bank
CEND	Centre for Distance Learning
DAC	Development Assistance Committee (of OECD)
EBSCO	Online research database
ESCMC	Escola de Ciências Marinhas e Costeiras
ESNEC	UEM Business School
ESUDER	Escola Superior de Desenvolvimento Rural de Vilankulo
FNI	Fundo Nacional para Investigação (National Research Council, Mozambique)
GDP	Gross domestic product
GoM	Government of Mozambique
ICT	Information and communication technology
ISP	International Science Programme - Uppsala University
ISRI	Higher Institution of International Relations, Mozambique
IWRM	Integrated Water Resources Management
MA	Master's degree (Master of Arts)
MCTESTP	Ministry of Science and Technology, Higher Education and Technical Professional Training
MINED	Ministry of Education and Human Development
MOSTIS	Mozambique´s Science, Technology and Innovation Strategy
MSc	Master's degree (Master of Science
NUFFIC	The organisation for internationalization of education, The Netherlands.
OECD	Organisation for Economic Co-operation and Development
PhD	Doctoral degree
RAF	Results assessment framework
RSA	Republic of South Africa
Sci Elo	Scientific Electronic Library online
SEK	Swedish Krona
STI	Science, Technology and Innovation
STIFIMO	STI cooperation programme between Finland and Mozambique
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToC	Theory of change
UEM	Eduardo Mondlane University (Universidade Eduardo Mondlane)
UKÄ	Swedish Higher Education Authority (Universitetskanslersämbetet)
UP	Universidade Pedagogica (Higher Pedagogical Institute)
WB	World Bank
WoS	Thomson/Reuters Web of Science

Preface

This evaluation was contracted by Sida through the Framework Agreement for Evaluation Services and conducted by the consortium led by FCG SIPU International AB, with partners Itad Ltd and Sthlm Policy Group AB. SIPU led this assignment.

The evaluation team consisted of the Team Leader Stein-Erik Kruse and team members Inge Tvedten, Matti Tedre and Carmeliza Soares da Costa Rosário. The report was quality assured by Derek Poate and the project manager was Johanna Lindström in the Evaluation Unit at SIPU.

The findings of the report are entirely the responsibility of the team and cannot be taken as expression of official Sida policies or viewpoints.

The team would like to thank stakeholders at UEM and at the Swedish Embassy in Maputo for constructive and useful cooperation throughout the evaluation process.

Executive Summary

Background and purpose

Swedish research cooperation with Mozambique (hereafter the 'UEM/Sida programme') was initiated in 1978 and will in 2017 enter its tenth phase. Sweden has, over a period of nearly 40 years, provided UEM an amount in excess of 700 Million SEK. The main objective of the current agreement 2011-2015 extended to June 2017, amounting to 283,354 Million SEK, has been to *"strengthen national research capacity so that Mozambique has the ability to better be able to plan, produce and use research in the fight against poverty"*. The cooperation focuses on institutional and research capacity building mainly at Universidade Eduardo Mondlane (UEM).

The purpose of this evaluation is to analyse, assess, generate knowledge, and provide lessons from the Swedish government funded research cooperation with Mozambique, with a main focus on the period 2011-2016. The evaluation results will also inform the design and improvement of performance of future support to Mozambique July 2017-2022.

Main findings

Training outputs

- The UEM/Sida programme has strengthened the capacity of a group of individual researchers and staff at UEM during the 2011-2016 period – but so far a relatively small number.
- The original target was to enrol 146 new students. Several students had not completed their studies in the previous programme (57) and were carried over and included in the current programme (2011-2016).
- There were 117 students actively involved in Master, Licentiate and PhD training (77% of the original target of 146 students).
- By end of 2016, there were 67 graduates: 42 PhDs, 19 Masters and 6 Licentiates (46 % of the original target).
- Students spent much longer time than originally planned completing their studies. The mean time for completing a PhD degree was 6.3 years, while a few did it in 3 years and one took 13 years. The mode was 7 years. Those figures do not account for those who have not finished yet. The mean time for completing a MSc degree was 3.4 years.
- Training capacity was strengthened by establishing four new Master programmes. From 2011 to 2015 the number of postgraduate programmes at UEM has increased from one PhD programme in 2011 to eleven in 2015 and eight MSc programmes in 2011 to twenty-two in 2015.

Publications

- The number of academic publications from UEM has increased, and the UEM/Sida programme has significantly contributed to that growth. The quality of the research is overall found to be good as reflected in types of journals and number of quotations.
- The number of articles published in non-indexed journals is high. There are sub-programmes where half the articles listed in some annual reports were published in non-academic, predatory open-access "journals" instead of proper academic venues.
- Between 2011 and 2016, UEM publications had co-authors from 133 different countries, mostly from the US followed by South Africa, Sweden and Portugal.
- UEM's average number of 5.7 citations per article in 2011-2015 is quite good. Articles from 2011 and 2012, to which other researchers have had time to react, have a particularly good average with 13.1 (2011) and 12.6 citations (2012) per publication respectively. Overall, the citation numbers stand comparison with the numbers of most industrialized countries.

Opportunities for research

- Opportunities for PhD graduates to be involved in research at UEM are limited due to a combination of heavy workloads and inadequate equipment. The Scientific Research Fund has provided some contributions, albeit insufficient for a full-time researcher.
- There are very limited funds available for research from the university itself, affirming the continued dependency and vulnerability of research activities at UEM.
- Of the seventeen graduates who received their PhD degrees between 2011 and 2014, only six continued to publish academic articles two years after their graduation.

Sandwich model

- The sandwich model for training MSc and PhD students – built on cooperation between UEM, South African and Swedish universities – has been instrumental in providing international exposure and offering training in high-level academic research environments. Most students took their studies in the sandwich mode.
- There is a gradual, but modest shift towards building research training capacity at UEM and reduce the dominance of Swedish universities in the sandwich model.
- Most study progress in the sandwich model happens during the periods in Sweden, while during "home" periods studies and research progress often grind down to a halt.
- The research facilities (including laboratories) at UEM are still inadequate, the capacity for supervision at UEM is still low, and the system with Swedish main supervisors and Mozambican co-supervisors has only occasionally been effective in terms of communication, transfer of knowledge and institutionalisation.

Institutional capacity

- The UEM/Sida programme has contributed to strengthening of institutional capacity at UEM, but to relatively small and varying degrees.
- Establishing the Cooperation Office from 2012 has strengthened programme coordination, but it appears to be relatively isolated from the rest of UEM's management structures.
- There are no specific activities in the programme with expected outcomes on strategic planning, change management and reform at higher levels in the university – despite the fact that changes at this level are expected by the Swedish Embassy.
- The support to the library has been significant and useful (e-books, journals, books), even though the unit is still not sufficiently incorporated into the formal academic structures of UEM and there is still a way to go in terms of creating a "culture" for using the library among UEM staff.
- ICT and equipment for carrying out research are found relevant and useful particularly when in Sweden in the post-graduate study phase, but is seen as inadequate by UEM staff for continuing research when returning to Mozambique after graduation.
- The Swedish Embassy has maintained a dialogue with the Ministry of Science, Technology, Higher Education and Technical Professional Training at the political level. The Embassy provides also support to the development of the national STI strategy and the national research council /FNI), but the cooperation with UEM is the most long standing and largest.
- There are policies and action plans for resolving gender imbalances at the university, but realities show persistent imbalances and low numbers of female researchers despite an increase in the proportion of women applying to UEM.
- The Cooperation Office is responsible for donor coordination (with Sweden, Italy and Belgium as the largest). However, there are limited formal coordination mechanisms and communication between external donors facilitated by UEM. Cooperation Partners in the area of higher education and STI meet regularly as there is a working group (chaired by Italy) that forms part of the dialogue coordinated by the MCTESTP. This mechanism was recently formalised by the Ministry and letters of "Adhesion" were signed by CPs.

Financial management

- There are elaborate guidelines for administrative and financial management that are being translated into improvements in administrative and financial procedures and systems from the Coordination Office and down to individual programmes.
- External audits have identified smaller technical weaknesses, but none of any systemic nature. Audits have found no evidence of financial mismanagement or corruption during the last reporting period.
- Two persistent issues regarding financial management are: (a) Low utilisation of resources and expenditure due to weak absorption capacity and long procurement

processes and (b) weak follow-up as to what extent equipment has been effectively used.
- The internal UEM monitoring and reporting mechanisms have been inadequate and slow. Basic data on research outputs (publications) have not been systematically collected. Annual reports are delayed (submitted late 2016 and not yet formally approved for 2014 and 2015) and documentation and analysis of achievements is weak.
- Funds are managed centrally by the Finance Directorate/Office in close collaboration with the Cooperation Office, with low levels of delegation to faculties and programme coordinators.

Overall conclusions

Relevance
- The programme has been highly relevant for UEM. Sweden has been a long-term supporter of UEM providing a comprehensive package of support first focusing on individual capacity building and later also on strengthening management competence and capacity. Such a long-term holistic approach adds significant value to the Swedish support.
- The selection of thematic areas and a Science, Technology and Innovation (STI) profile is in line with UEM and national higher education/research priorities in Mozambique. While important, this may have been at the expense of the university as a critical voice in Mozambican society that social sciences and humanities may be in a better position to provide.
- The sandwich programme has been in line with university and individual researcher needs, in particular during the period of post-graduate education. There have been improvements in conditions for research at the individual UEM faculties, but in practise graduates face difficulties in prioritising research after finishing their studies.
- The programme has not been adequately designed and followed up for addressing strategic reforms at the university as such and for the sector of higher education and research.

Efficiency
- There continues to be long delays in implementing the programme and in particular the PhD training, which reduces efficiency. Most students are only part-time students. The large majority combines their studies with teaching, consultancy work and other income generating activities. Master students go to classes and study in the evenings.
- The mean time of graduating from the programme has not been markedly different from the mean time of PhD graduates in Sweden in general, but that mean time does not account for the large number of students not yet finished.
- The total cost of the programme and costs per student in sandwich mode is high compared to the relatively low outputs so far.

- When students are in Sweden and South Africa they are able to study full-time, but while in Mozambique they have to teach and be involved in administrative matters at the university.
- The UEM procurement system is a serious constraint. Procurement of necessary equipment for researcher training is systematically delayed, making it difficult to complete studies on time.
- The large majority of co-supervisors at UEM do not provide sufficient support and guidance while students are in Mozambique, which delays the process of completing studies further. Co-supervisors are often not experts in the students' topics, which points towards an issue with selection of topics.
- There are no effective rules and sanctions against serious delays. Failures to complete studies on time or to progress in studies are not systematically monitored, and sanctions are not systematically enforced.

Effectiveness and impact

- The UEM/Sida programme has trained a group of individuals in Mozambique and staff at UEM to the highest academic level and provided international exposure and experience. Original targets are still not met. If a significant number of PhD degrees are granted in 2016 and 2017, effectiveness will be acceptable.
- It is almost certain that without Sida support the research capacity building at UEM would not have taken place to the extent achieved.
- Almost all staff trained have remained at UEM, both during the compulsory period following graduation and beyond. This reflects a general trend of Mozambicans abroad moving home, the fact that UEM remains the only university in Mozambique with room for research, and the research environment that the university offers.
- The programme has contributed to building a critical mass of researchers in some thematic areas and faculties, which is an important prerequisite for achieving UEM´s explicit policy of becoming a research based university. Time spent teaching is still extremely high and opportunities for doing research low, making such a transition process slow and challenging. Time spent teaching could be reduced by planning and implementing teaching differently.
- Most results can be found at the individual level – in training staff members to a high academic standard, while the effects on the research environment (organisational and institutional impact) are less prominent.
- The research programmes do to some extent – directly but mostly indirectly – support national social and economic development and contribute to poverty reduction. This is so far mainly visible in the form of direct programme interventions. It is too early, and will be difficult also in the future, to ascertain the overall implications of having highly educated university staff with research and teaching responsibilities.

Sustainability

- The academic and institutional capacity for sustaining the activities without Swedish support has improved, but the likelihood of financial sustainability of

continued research training and funding of research post-Swedish support is weak.

- The research grants have contributed small resources to encourage research at UEM. UEM has not increased its capacity to attract national and external funds for research. The external donors and funding patterns have remained the same during the period, but government support to research has decreased.
- Complacency and dependence on one major donor may be a challenge for UEM and Sida, with the former arguing that research activities in the relevant areas of support will virtually stop should the support be discontinued. Little attention has been given to an exit strategy.

Recommendations

Sweden has, over a period of 38 years, provided UEM an amount in excess of SEK 700 million – a long period of time and large amount by any standards. As such, it could be argued that the programme has reached a crossroads, where alternative options for improved quality and higher impact should be considered.

Several short-term recommendations are provided, and in addition four scenarios are presented as options for Sida and UEM. They are placed on a continuum from incremental reform to more fundamental change.

Scenario 1: Consolidation and evolution

Consolidate and improve components in the existing programme – a combination of sandwich training and organisation and infrastructure development – with adjustments in Sweden/RSA as well as at UEM. Possible reforms would consist of: (a) A longer period of time for students in Sweden, particularly in the early phase to secure a good start and in the final phase to support the last stretch of thesis writing, (b) a partial reorganisation of the cooperation with RSA, in order to ease the burden of practical challenges for students, and (c) involve the co-supervisors at UEM more actively in the programmes and at the same time prepare the ground for students returning so that UEM supervisors and graduates can devote themselves to research and UEM realise its potential as a research based university.

Scenario 2: Towards national capacity building

The second option is to make a more deliberate and systematic transition from Swedish/South African sandwich training to building research and research training capacity at UEM. Efforts could be done to develop and consolidate existing Master and PhD courses/training at UEM, and only subsequently develop new if relevant.

Mozambican students would not go to Sweden and South Africa for extended periods of time, but for short courses or only when required. Teachers from Swedish and other external universities would be used for curriculum development, supporting crosscutting courses for students and supervisors, acting as co-supervisors and – with support of Swedish/South African university managers (peer support) – advising the university in strategic planning and management. Funds released by having ‘cheaper

students' though shorter stays abroad could be used to invest in improved equipment/research conditions at UEM.

Scenario 3: Diversification

Swedish support could in the future be used to strengthen the capacities in one or several other universities through more direct and targeted support. Other universities in Mozambique have so far only benefited indirectly and probably marginally from Swedish support to UEM. It is not certain to what extent this is feasible, even though there are obvious candidates such as the Pedagogical University and the Catholic University, and possibly also private universities, such as Politécnica.

Scenario 4: Encourage excellence through competition

The argument in the fourth scenario is that perhaps time has come to move from research training to funding research. Training of researchers at UEM has been supported for nearly four decades, but the majority of researchers do not actually work as researchers, but as teachers. Hence, the best-qualified researchers in Mozambique should be given opportunities to work as full time researchers. Competitive grants schemes would be the preferred mechanisms for financing research especially where resources are limited – provided that they are administered with transparency, and are merit-based and rule-bound. In most countries, national research grant recipients are decided by independent, international teams of experts.

1 Introduction

1.1 BACKGROUND

Swedish research cooperation with Mozambique was initiated in 1978 and will in 2017 enter its tenth phase. Sweden has, over a period of 38 years, provided Universidade Eduardo Mondlane (UEM) assistance for an amount in excess of 700 Million SEK. The cooperation focuses on institutional and research capacity building mainly at UEM. UEM is the oldest, largest and most prestigious university in Mozambique, with 17 faculties and approximately 39,000 enrolled students.

The cooperation has been evaluated with regular intervals. An evaluation in 2003 (Alberts et al. 2003) acknowledged that Sweden has been instrumental in strengthening the university, but also claimed that there were severe problems in the management of the university, in donor coordination, and in the completion rate among PhD students. Another evaluation from 2004 (Sall et al. 2004), which compared UEM with other African universities in the social sciences, was also critical particularly in terms of the quality of teaching staff and higher level (Master and PhD) outputs.

Two more recent evaluations were more positive to Swedish support: In 2008, UEM carried out a self-assessment of Sweden's long-term support (UEM 2008), which concluded that the programme has had a positive impact on the research and research culture of the university. It claimed that UEM research had led to policy changes and researchers participated in and influenced international negotiations, but the evaluation accepted that utilisation of research results outside the university was still weak. In an Assessment memo from 2010 (in Sida 2011), Sida concluded that UEM played an important role in building qualified research capacity and was in the forefront of research in the country.

The new programme proposed by UEM for July 2017-2022, entitled “Strengthening UEM’s Capacity to Promote High Quality Research and Produce Scientific Knowledge for National development: Towards a Research-Led University”, attempts

to consolidate achievements made to date as well as address new and remaining challenges identified during the previous phases.

1.2 PURPOSE AND SCOPE

The purpose of this evaluation is to analyse, assess, generate knowledge and provide lessons from the Swedish government funded research cooperation with Mozambique[1], with a main focus on the period 2011-2015[2]. The evaluation results will also inform the design and improvement of performance of future support to Mozambique July 2017-2022[3].

The point of departure for the Swedish support to UEM is the overall objectives of the Strategy for research cooperation and research in development cooperation 2015-2021: "*to strengthen research of high quality and of relevance to poverty reduction and sustainable development, with a focus on low-income countries"* (Ministry of Foreign Affairs 2015).

The evaluation has:

1. Assessed to what extent the programme has contributed to the expected outputs (e.g. number of graduates, publications, courses), outcomes (e.g. institutional development) and impact (e.g. wider socio-economic implications) – and the sustainability of these results.
2. Assessed the efficiency (including cost-effectiveness) of the programme design, organizational set-up and cooperating partners in the delivery of expected outputs.
3. Determined achievements and weaknesses and suggested recommendations for the future programming phase.

1.3 OVERARCHING APPROACH

The Terms of Reference included 56 evaluation questions, plus further 14 issues under which to frame recommendations listed under the standard OECD/DAC evaluation criteria. In order to organise the evaluation and avoid fragmentation, this report discusses and structures the questions under three broad themes and levels of capacity strengthening:

[1] Annex 1: Terms of Reference.

[2] The programme period was extended to 2016.

[3] UEM has already submitted a proposal for the next period 2017-2021 to the Swedish Embassy (August 2016). In order to have an impact on the planning/outcome of this process the evaluation should preferably have been carried out in 2015 as originally envisaged. However, the review of the proposal is ongoing and the evaluation team has been assured by the Embassy/Sida that findings and recommendations from the evaluation will be considered and used.

(a) Training of researchers, production of scientific results and the quality and relevance of those results.
(b) Institutional capacity – management, organisation, cost-efficiency and sustainable funding.
(c) The wider effects of research – e.g. influence on development policies, policy makers and dimensions of poverty.

As such, three overall questions guided and provided direction to the evaluation:

(a) To what extent has the programme trained qualified researchers and produced high quality research?
(b) To what extent has the programme strengthened research management and infrastructure?
(c) To what extent has the programme been relevant and contributed to socio-economic development in Mozambique?

Box 1: Three levels of capacity strengthening

Capacity strengthening is understood as the process by which individuals, organisations and institutions increase their abilities and performance in relation to their goals, resources and environment. Capacity strengthening can be divided into three distinct levels:

- *Development of human resources*: how researchers are educated and trained, the competence for research, how this is translated into actual research projects and products and ultimately used. This is the first and basic building block in capacity strengthening development.
- *Organisational strengthening*: strengthening structures, processes and management systems in the universities in order to improve the efficiency and effectiveness of organisational performance.
- *System strengthening*: strengthening relevant dynamics and processes beyond the university. It brings in the context within which the universities operate. It consists of several sub-levels such as (a) linkages with other national, regional and international partners, (b) the higher education sector, (c) policy and institutional environment - including links between research, innovation, inclusive development and poverty reduction (See Kruse 2013 & Sida guidelines 2008).

In line with such an approach, our starting point was assessment of research capacity development and actual production of scientific results in terms of outputs and outcomes, as measured by standard, objective academic citation indices, including Elsevier's Scopus and ISI Web of Science[4]. Those results were augmented with data from universities' reports and official graduation statistics. In addition, other research outputs were considered, including UEM's internal publications (such as the internal UEM series *Revista Científica*), reports to government and donor agencies, and popular publications in media – which, according to Fellesson and Mälck (2013), constitute a larger part of published outputs than national and international peer-reviewed books and articles do.

[4] https://www.elsevier.com/solutions/scopus and www.webofknowledge.com

The assessment of the management, organisation and efficiency of UEM in general and the Swedish research cooperation in particular was done on the basis of written documentation and a large number of interviews with stakeholders in Sweden (management, staff, and students) as well as in Mozambique (UEM management, programme coordinators, project supervisors, and students). Special attention was given to financial management/costs of the sandwich model.

Universities and research programmes also have long-term objectives in terms of societal impacts. However, there are often no easily identifiable causal links between support to research and broader political, social and economic changes. The most direct impact is typically in the form of the engagement of researchers outside the university premises – as full or part-time employees in the public/private sector or through consultancies in which a large number of UEM employees are involved. The analysis of impact was based on interviews with external stakeholders, as well as case studies of individual projects or interventions.

1.4 METHODOLOGY

The evaluation used three methods for data collection: Document review, interviews (individual and group interviews), and a survey. Publication information was extracted from international publication indexes.

(a) Document review

The review of background documents covered[5]: Applications from UEM faculties/institutes for funding and collaboration under the UEM/Sida programme, appraisal and appropriation documents from Sida, progress reports and annual reports from UEM, reviews and evaluations, relevant secondary information.

(b) Interviews

The main types of interviews were with[6]:

- In Sweden: Sida in Stockholm, the International Science Programme (ISP) at Uppsala University and students and supervisors from a selection of collaborating Swedish universities.
- Swedish Embassy staff in Maputo.
- At UEM: Programme coordinators or contact persons, project coordinators, recipients of faculty research funds under the programme, academic staff members involved in teaching, supervision and research for all research areas

[5] See Annex 2: References

[6] See Annex 3: People met

supported by Sweden, senior management, PhD/MSc students and researchers, members of the Programme Management committee. Government officials.
- Other donors (Italy, Belgium and the World Bank) and external public and private sector institutions employing and/or using UEM graduates.

Approximately 85 persons were met with and interviewed either individually or in focus groups. The interviews were semi-structured and guided by questions tailored to the various target groups. Notes were taken from all interviews, collected in a joint reference document, and subsequently analysed and used in the evaluation[7].

(c) Tracer study

Fellesson and Mälck (2013) carried out a tracer study among the Swedish supported students graduating between 2010 and 2013. To amend those results, this evaluation conducted a follow-up tracer study for the period 2013 to 2015 among 31 graduates (29 responded). An e-mail survey was combined with more in-depth interviews with graduates from the period 2011-2015 in order to better ascertain the dynamics of employment acquisition and performance.

(d) Analysing relevance and application of research

The following approach was followed to assess questions about relevance and impact:
- Questions about relevance and impact of research were included in all interviews, which yielded a broad range of qualitative perceptions from internal and external stakeholders.
- Selected research projects considered innovative, of high quality and with impacts on Mozambican society are presented as illustrative cases in the report.
- In order to assess dissemination and use, statistics of relevant Mozambican publications were compiled in combination with references to relevant Mozambican research. [8]

(e) Assessing quality

Aspects of quality have been assessed as follows:
- For scientific results, two common proxies for quality were used: journal impact factors or rankings (how many articles appear in reputable journals or publication series) and citations (how many times other researchers have referred to works published under the programme). Those data were extracted from Elsevier's Scopus and ISI Web of Science.

[7] Formats and questionnaires were presented in the Inception Report.

[8] The main citation index used was Elsevier's Scopus, which covers 21000 academic journals from 5000 publishers. ISI Web of Science was used to support data from Scopus.

- Questions about quality and relevance were pursued in interviews with students, research coordinators and supervisors for providing additional views and perspectives.
- Independent expert judgment was pursued by interviewing a sample of users about their perception of UEM research competence and quality. Observations and findings from the external quality assessment carried out in 2014 were also considered[9].

1.5 LIMITATIONS

Limitations and challenges in this evaluation were:

- The Terms of Reference included 56 questions and 14 issues for the recommendations. They are all relevant, but the large number made it difficult to answer them all equally thoroughly.
- Complex results and processes involving short- and long-term change at individual, institutional and policy levels were difficult to capture in a short evaluation such as this.
- There were gaps in availability of data and information, such as no complete list of all academic publications for the 2011-2016 period[10].
- There are inherent challenges related to attribution of outcomes and impact of specific research efforts and interventions, in a context where a range of other external factors are likely to have made a difference.
- This was not an independent evaluation of the scientific/technical quality of individual research studies/programmes and research training. Evaluating the scientific quality of MSc and PhD programmes would have required subject matter specialists—medical researchers, natural scientists, computer scientists, and experts from all fields.
- A team member Matti Tedre, now a faculty member in a Finnish university, was for a period of time a supervisor for one student from Mozambique. The Embassy was informed and it was not considered problematic, given his focus on statistical analysis and data collection.

[9] Swedish Continued Research Cooperation with Eduardo Mondlane University. Evaluation Committee Report (2014).

[10] The research reports are not collected and available in the central library. The publication lists in annual reports are inconsistent and incorrect. The research programmes provided incomplete lists of publications to the Cooperation Office for inclusion in the annual reports to the Embassy.

2 Research Programme and Context

2.1 OVERVIEW OF THE UEM/SIDA PROGRAMME

The Swedish research cooperation with Mozambique was initiated in 1978 and will in 2017 enter into its tenth phase. In the initial phase, support was directed towards development of research capacity through individual research projects and training of researchers abroad. From the early 1990s, the cooperation was broadened to include institutional and research capacity building at Universidade Eduardo Mondlane (UEM). Sweden has, over a period of 38 years, provided UEM support for an amount in excess of SEK 700 million (
Table 1).

Around 2011, the administrative responsibility for the support was moved from Sida in Stockholm to the Swedish Embassy in Maputo. This allowed closer contact between Sweden as a donor and UEM as a recipient and a partner. At the same time, the coordination of activities in Sweden was centralised at Uppsala University's International Science Program (ISP).

Table 1: Swedish Support to UEM Per Period of Agreement (in Million SEK)

Years	78-80	81-85	86-90	91-94	95-97	98-00	01-05	06-10	11-June 17
Total	1.395	11.765	29.070	44.300	28.669	79.178	84.133	175.555	283.354

The main objective of the current agreement 2011-June 2017, amounting to SEK 283,354 million,[11] has been to *"strengthen national research capacity so that Mozambique has the ability to better be able to plan, produce and use research in the fight against poverty,"* which implies an increasing focus on the impact of the cooperation on national development and poverty reduction. In line with Mozambique's own National Strategy for Science, Technology and Innovation (MOSTIS), the main emphasis in the programme has been on applied sciences, such as sustainable agricultural production, livestock production, sustainable technological

[11] Annual disbursements: 2011: 35,520,648 SEK; 2012: 45,549,719 SEK; 2013: 60,141,225 SEK; 2014: 50,776,325 SEK; 2015: 52,152,347 SEK; 2016: 38,654,894 SEK; 2017: 558,844.

development, environment and climate and health/education – with social sciences and the humanities afforded a more limited and cross-cutting function in sustaining the strategic areas.
The support has focused on:

(a) Collaborative research and postgraduate (doctoral) training
(b) Local postgraduate research programmes
(c) Improvement of research environment
(d) Strengthening research management capacity
(e) Strengthening library services

The main components have been:

(a) Postgraduate training in Sweden and South Africa
(b) Postgraduate training at UEM
(c) Improvement of research environment and infrastructure
(d) Improvement of research management and administration

The programme targets for this period were to train 99 PhD students and 46 MSc students from 12 different UEM units, and to give support to libraries, laboratories and the Marine Biology Research Station at Inhaca Island. Support has also been provided to establish four Master programmes at UEM, and to a limited number of Mozambican Master students in South Africa. Finally, support has been provided to university postgraduate, facility and research funds, as well as research management and coordination (see Annex 4).

Most research training abroad has been based on the sandwich model. The majority of students (67%) were expected to receive their degrees at Swedish universities while 33% were expected to get their degrees from South African universities. All students were staff members at UEM (Sida 2011).

The expected results were:

(a) Increased capacity to conduct research of scientific quality and with relevance to national development needs.
(b) Increased capacity for postgraduate training at UEM.
(c) Enhanced capacity for supervisors to supervise Masters and Doctoral studies.
(d) Increased capacity to assist other public universities to conduct research.
(e) Increased research productivity.
(f) Improved research management and coordination in UEM.
(g) Improved research communication.

(h) Increased collaboration with other institutions/universities internationally and nationally, thereby strengthening the national research system.[12]

Theory of Change

No explicit theory of change (ToC)[13] has been developed for the Swedish support to UEM, partly because such a concept was uncommon at the initial phase of the programme. However, based on policy and programme documents from Sida and UEM, it is possible to identify its main elements and construct ex post an implicit theory of change. This could help to clarify what should happen in order to reach expected results, and to discuss the programme's underlying assumptions.

Table 2: Implicit Theory of Change for the Swedish support to UEM

Inputs	Outputs	Outcomes	Impact
Funds for postgraduate training in Sweden and RSA	No. of PhD and MSc graduated	Increased capacity to conduct research of scientific quality and relevance Increased capacity for postgraduate training at UEM Enhanced capacity of supervisors to supervise Masters and Doctoral studies Increased research productivity Improved research communication Increased collaboration and networking internationally and nationally	Strengthen national research capacity Make Mozambique better able to plan, produce and use research in the fight against poverty
Funds for postgraduate training at UEM	No. of MSc programmes increased/students graduated		
Funds for research	No. of research projects No. of publications		
Funds for infrastructure (laboratories, literature, ICT)	Equipment delivered		
Funds for strengthening research management	No. of staff trained	Improved research management and coordination in UEM	

[12] See also Results Assessment Framework (Appendix 6 in Programme Document). Up to 2010 UEM had 223 PhD staff, 30 Master and 2 PhD training programmes and "good" laboratories. Expected outputs and outcomes are listed.

[13] A Theory of Change (ToC) is a description and illustration of how and why a desired change is expected to happen in a particular context. It is focused on mapping out or "filling in" what has been described as the "missing middle" between what a programme or change initiative does (its activities or interventions) and how these lead to desired goals being achieved.

The explicit and implicit assumptions in the Theory of Change are discussed in Chapter 6.2.

Budget and expenditure

A complete overview of budget and expenditures for all programme components can be found in Annex 4. Table 3 below contains aggregate figures for the 2011-2016 period (in Million SEK):

Table 3: Programme Budget 2011-June 2017 and Expenditures up to 31 Dec 2016

	Total budget	UEM budget	Swedish budget[14]	Expenditure	Unutilised	% unutilised
	2011-June 2017	2011-June 2017	2011-June 2017	2011-2016	As of 1 Jan 2017	
Total	260.836	168.105 (65)%	92.732 (36%)	155.772	12.333	4.7%

The main issues and trends are:

- By end of year 2016 4.7% of total funds remained unutilised. The programme should have ended in 2015, but was extended by one year and later an additional six months to June 2017 to increase the number of graduates and spend unused funds.
- Approximately 35% of the funds were used in Sweden, while 65% were used by UEM including training costs for UEM students in South Africa.
- Most of the research programmes have used the bulk of their resources except for Programme 2 (zoonotic diseases) and Programme 10 (child health).
- There is under-expenditure of allocations for research management, including the Postgraduate Fund (40% unused) and the Training of Research Management Staff (98% unused).
- There are also remaining funds for all the four Master programmes at UEM (from 15% to 52% of budget).

2.2 THE NATIONAL RESEARCH CONTEXT

Higher education and research in Mozambique dates back to 1962 and the establishment of a Portuguese university branch named *Estudos Gerais e Universitários de Mocambique* – subsequently becoming UEM. By the country's independence in 1975, Mozambique had only 40 black Mozambican students representing less than 2% of students. This, together with the exodus of qualified

[14] The Swedish budget is part of the total UEM budget.

Portuguese people, meant that independent Mozambique faced formidable challenges in education. Emphasis was initially given to enhancing the level of primary and secondary education, seen both internationally as well as in Mozambique as giving the best options for social returns including poverty reduction. Up until 1984, when the Higher Pedagogical Institute (UP) and the Higher Institute for International Relations (ISRI) were established, UEM represented the only institution of higher education in the country (UEM 2015).

Increasing societal demands for university-trained individuals prompted the government to launch two commissions in 1997 and in 1999. The result was the Strategic Plan for Higher Education for 2000-2010 and the creation of the new Ministry for Higher Education, Science and Technology (MHEST). In 2005, MHEST was split, with higher education being integrated into the Ministry of Education and Human Development, while science and technology became part of a separate Ministry for Science and Technology. A new strategic plan for higher education was approved in 2012 – for the period 2012-2020. And in 2015 higher education was incorporated into a Ministry of Science and Technology, Higher Education and Technical Professional Training (MCTESTP) when the current government took office.

The period from the mid-1990s has been the most expansive in the history of higher education in Mozambique, both in terms of institutions and student enrolment. The number of institutions had grown from four in 1995 to 28 in 2014 (Langa and Zavale 2015). A large number of these new institutions are commercially run private enterprises. Private institutions now account for almost one-third of enrolled students. As such, UEM's dominant position is increasingly challenged by the Catholic University (Universidade Católica) and the Pedagogic University (Universidade Pedagógica) having a broader national coverage.

The most remarkable feature of higher education is the dramatic increase in student enrolment, with almost four times as many students in 2013 as in 1995. Even though female student numbers have increased, gender disparity remains a problem. In 2013, female students made up only 25% of total enrolment at public institutions, while the share was 46% at private institutions (Fellesson & Mählck 2013).

In global terms, Mozambique is a small provider of scientific knowledge, which is a direct consequence of shortage of resources to support research and train researchers. With many years lost through civil war, the country is currently one of the weakest research producers in sub-Saharan Africa. According to UNESCO statistics, the total number of researchers is 64 per million inhabitants (2010). By comparison, similar numbers for South Africa were 818 (2012), Tanzania 69 (2010) and Uganda 83 (2010) (Africa Capacity Report 2016, p. 51).

The government of Mozambique considers higher education and research important preconditions for the country's development (RdM 2015). In line with African

Union's Agenda 2016 and UN Agenda 2030, science, technology and innovation (STI) is emphasised as a fundamental tool for driving the achievement of these visions (Africa Development Report 2016). However, in the past few years UNESCO reports that the Gross expenditures on research and development were 0.42% in Mozambique while 0.48% in Uganda and 0.73% in South Africa.[15] The governmental support covers mainly salaries and offices of research institutions. In 2015, Swedish support to Mozambique represented 75% of the donor support, Italy 19 %, Belgium 4% and Holland/NUFFIC 1% (according to UEM 2016, donor support is down to 12% of the total budget that year (see Informe do Reitor 2015). In addition, much research is funded through applied research and consultancies requested by Mozambican institutions and donors.

2.3 NATIONAL RESEARCH OUTPUTS

In order to place the evaluation in a broader perspective, the overall research outputs in Mozambique were studied. A bibliometric analysis using standard research indices allows analysis of temporal and geographical trends. For this purpose, data were extracted from Elsevier's Scopus, which covers 22.000 publication venues and offers data at a country, institution, and researcher level. The past 20 years of indexed Mozambican research activity were analysed.

In 1996, four years after the civil war ended, 23 articles with Mozambican authors appeared in indexed journals, which situated Mozambique to position 31 out of 53 African countries in the index. The number of publications lingered below 50 per year until 2003, which marked a turning point in Mozambican publishing activity. The average annual growth rate after 2003 has been very fast, 19.6%, which is over three times the global average annual growth. That growth resulted in 299 indexed publications in 2015 (Figure 1).

[15] The Africa Capacity Report (UNESCO, 2016) estimates only 0.42 % of GDP for research in Mozambique.

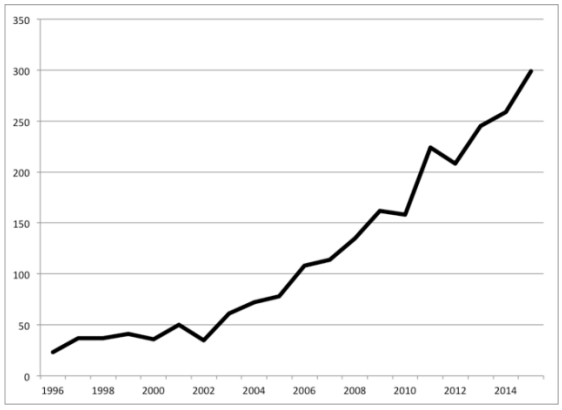


Figure 1: Growth of Mozambican Annual Research Output (Source: Scopus data)

Mozambique's growth of research output in terms of numbers has not been only absolute, but also relative to the region and the rest of the world. Mozambique's research output has grown considerably faster than average. Mozambique steadily improved its place in Africa's regional statistics, climbing from rank #31 in 1996 to rank #23 in 2015, as well as climbing more than twenty ranks in global statistics (from #144 in 1996 to #120 in 2015).

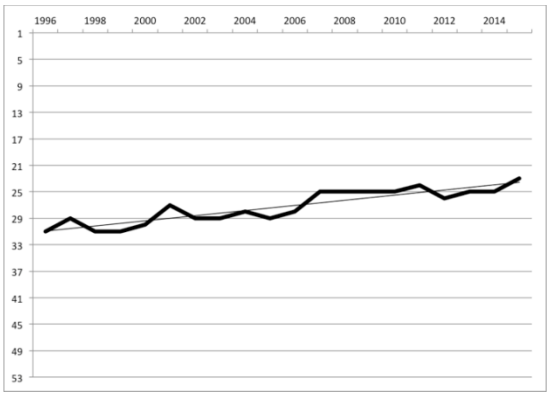


Figure 2: Mozambique's Regional Ranking in Annual Publications (Source: Scopus data for Africa, 53 Countries)

Citations to works by Mozambican authors have risen accordingly. Citations are one indicator for impact or visibility of research within the academic community: the more citations, the higher visibility. The growth of citations to articles by Mozambican authors is consistent and very positive.

Two broad sectors account for roughly 65% of increase in Mozambican research output: Medicine-related research (including health sciences) and agriculture and biology-related research (including veterinary sciences). Until 2005, the sectors grew at about the same pace, but while the agriculture- and biology-related sector kept growing at a good pace, medicine-related research had a sudden boost of very rapid growth that has continued ever since.

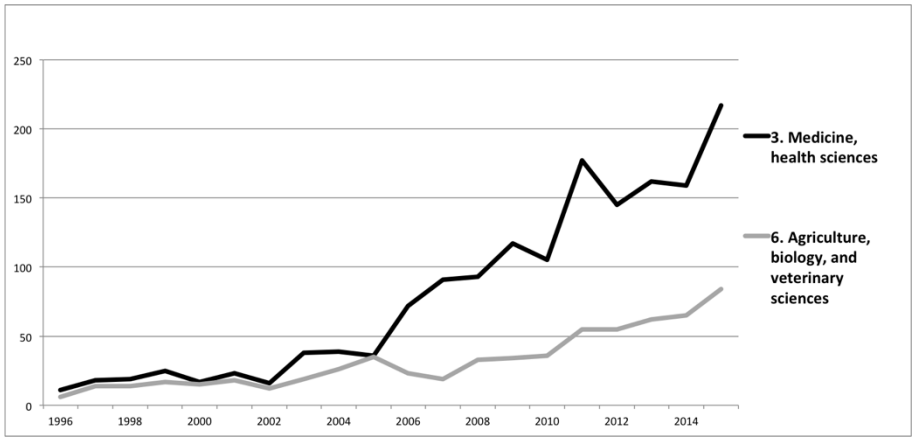


Figure 3: Publications in Two Largest Research Sectors in Mozambique (Source: Scopus data)

The growth trends of other fields have been positive, too. For example, annual publications in natural sciences and mathematics grew from single publications per year in 1996 and 1997 to thirty-five per year in 2014 and 2015. Publications in social sciences, arts, and humanities grew from single digits before the 2000s to solid 30-40 in the 2010s, with a record number 54 publications in 2015. Figure 4 presents the growth trend lines of sectors not in Figure 3 (the two figures are to different scales). The lines in Figure 4 represent average trends, which gives a better idea of growth than the actual numbers, which fluctuate greatly between years.

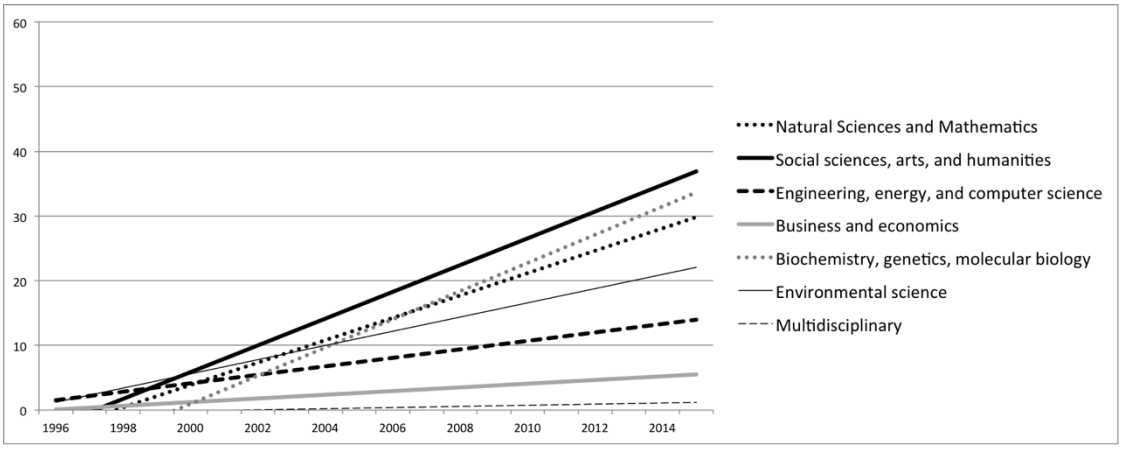


Figure 4: Growth Trends of Publishing Across Research Sectors in Mozambique (Excluding Medicine and Agriculture-Related Fields) (Source: Scopus data)

Having said all this, it is imperative to avoid comparisons between sectors in terms of number of publications. Important research in sociology or history may yield much fewer publications than important research in computer science, and the publication patterns and "least publishable units" differ between fields. Overall, the general growth trends are positive across all the fields. Multidisciplinary publications are so far too few for analysis, but increasing them is an objective of the new programme (2017-2022).

2.4 EDUARDO MONDLANE UNIVERSITY

UEM is the oldest, largest and most prestigious university in Mozambique, with 17 faculties and 39,078 enrolled students in 2015 (UEM 2016, see also www.uem.mz). This is an increase of 30% since 2011 and 6% since 2014. The main campus is located in Maputo, with smaller branches in Inhambane, Vilanculos, Quilimane and Chibutu and options for distance learning through the Centre for Distance Learning (CEND). According to UEM, the university has 1790 full time academic staff members (both nationals and foreigners). 558 of these had undergraduate degrees, 852 had Master degrees, and 380 or 21% were PhD holders. 73% were men and 27% were women. UEM is the only university with major research programmes at postgraduate level, but other universities are introducing them.

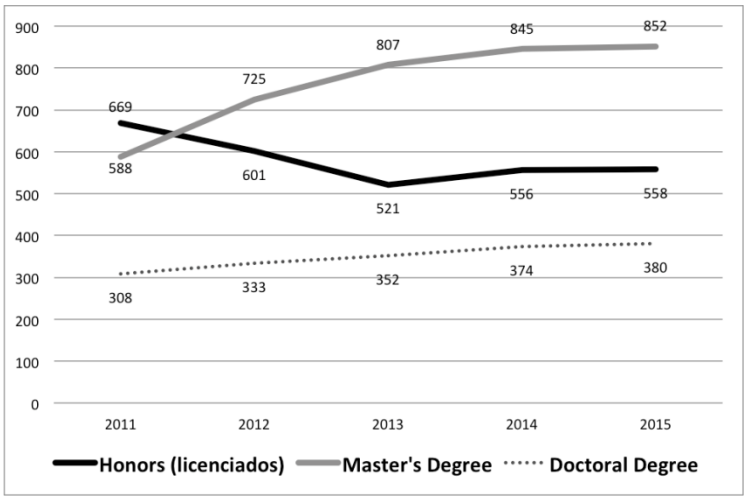


Figure 5: Levels of Academic Degrees Among Staff – UEM 2011-2015 (Source: UEM 2016)

Competition for student entrance is high and done through entrance exams. However, for the first time since 2007, UEM saw a reduction in student applications between 2014 and 2015 (at 7%) - probably related to increased access to other institutions of higher learning (UEM 2016). This implied a reduction in applications per vacancy from six in 2014 to five in 2015. There was an increase in the proportion of female applicants from 47% to 49% in the same period.

Of the admitted candidates in 2015, 62% were men and 38% were women, which is a small decrease for the latter since 2014. Of the 39,078 students matriculated in 2015, 23% were in the Faculty of Humanities and Social Sciences, 14% in the Faculty of Science, and 13% in the Faculty of Engineering. The Faculties of Education and Medicine have the largest proportion of women. 91.7% were Honours (Licensiatura) students, and 8.3% were post-graduate students (Master and PhD).

In 2015, 2278 students graduated from UEM, of whom 62% were men and 38% women. The number decreased by 13% since 2014. 96% graduated with a Licensiatura (equivalent to an honors degree between bachelor's and master's degrees), and 4% with post-graduate degrees (of which one was a PhD). This is very

low in African context, where post-graduates typically represent around 20%, but the figure does not include Mozambican students who graduated abroad (including in the UEM/Sida programme) (UEM 2016, see also UEM 2014).

UEM has an explicit policy of moving from being primarily a teaching institution to become a research-based institution or *Universidade de Investigação* (UEM 2016: 15). The number of ongoing research projects (*projectos de investigação*) at UEM has increased from 284 in 2011 to 352 in 2015 – albeit with a record number in 2014 with 395 projects. Most of the projects were in the Humanities and Social Sciences. Sixty-five of the projects in 2015 were financed by Sweden.

Finally, the following graph shows the number and distribution of publications at UEM as reported by UEM (2016). While numbering twice as many as in 2011, UEM still states that the number of publications is well below their ambitions and that they reflect a poor capacity for UEM's own data collection and a poor culture for publishing (UEM 2016:20). However, the numbers in Figure 6 differ from results from independent sources cited above, which is difficult to explain as UEM data does not report the types or channels of publications.

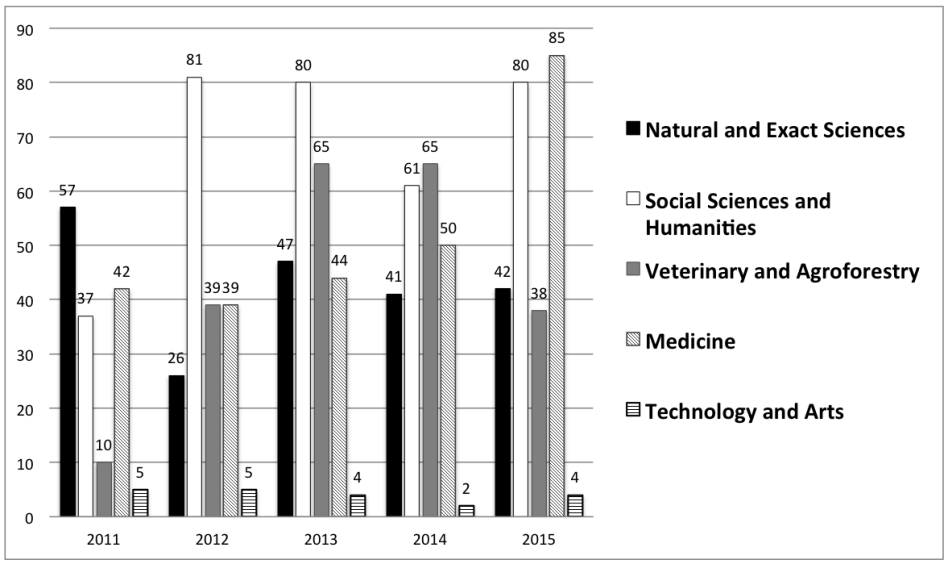


Figure 6: Publications in 2011–2015 reported by UEM (Source: UEM 2016)

UEM's position is increasingly challenged by other public universities such as the Pedagogic University/UP with 52,000 students (13,000 more than UEM) and with the headquarters in Maputo and branches in ten provinces (www.up.ac.mz), as well as the Catholic University /Universidade Católica with branches in Beira, Chimoio, Cuamba, Nampula, Pemba Quelimane and Tete (www.ucm.ac.mz/cms). More recent public universities are UniZambeze in Tete and UniLurio in Nampula. In the past decade, there has also been a proliferation of other smaller and private universities now covering all provinces (see Langa and Zavale 205). Among these are Politécnica, with presence in Maputo, Quelimane, Tete and Nampula and Universidade São Tomás in Maputo. The large number of universities represents employment options

for UEM's graduates, but the proliferation of universities and graduates also raises important issues of quality and relevance of teaching and degrees.

2.5 CONTEXTUAL FEATURES

Two significant contextual features influence all institutions of higher learning in Mozambique –including UEM and the Swedish funded programme at UEM –. One is the system of basic education in the country, which is still characterised by poor quality, limited completion rates, and a system of learning that favours mechanical learning rather than critical thinking (UNICEF 2014). While those students who reach the university level have been able to surpass these constraints, they are still not used to the type of independent reflection that a university education requires. In fact, metacognitive challenges, or the limited critical and reflective stand to one's own knowledge-base and the challenges UEM students and staff have in writing independent analytical texts, were highlighted by most of the external stakeholders who were interviewed in government, the private sector, as well as civil society.

The second contextual feature is the current political and economic crisis in Mozambique combined with poor governance and corruption, cuts in donor funding following large undisclosed foreign loans, a spiralling inflation, a sharp drop in the value of the national currency, and budget deficits (Tvedten and Orre 2016). The crisis has had immediate effects for the universities including UEM, not only in terms of transfers of budgeted state funds to the university as such (during the time of our fieldwork the rumour was that there was money for salaries only for two more months) but also for the economic situation of the individual staff and students. According to some sources, including currency rate histories, the real value of the salary in dollar terms is only 50% of what it was only two years ago.

3 Research and Capacity Building Results

The Sida-supported programme 2011-2016 involved support to a total of i) 12 research programmes, ii) the Cooperation Office, iii) the Scientific Directorate, iv) the Central Library, and v) Master Programmes. This chapter focuses on the numbers of people trained in the PhD and MSc programmes and short-term courses, the utilisation of the facility, postgraduate and scientific research fund, and the level of academic publications from the research programmes.

3.1 TRAINING OUTPUTS

UEM still suffers from scarcity of human resources, particularly for research. Hence, strengthening research capacity has been a major objective in the UEM/Sida programme. Accordingly, the first questions in evaluating the programme's research and capacity building results were concerned with effectiveness and efficiency: Are targets met in terms of training and graduating students on time? The number of graduates and completion rates are common measures for outputs, and also a useful way for estimating outcomes in terms of labour market entrance. Efficiency in costs is here only assessed by looking at variation in the number of years for completing MSc and PhD degrees.

This evaluation looks at training outputs through three components:

(a) PhD and MSc sandwich training
(b) Master programmes
(c) Cross-cutting courses

PhD and MSc Training Outputs.

According to the original plan (Agreement 2011), the programme should train:

- 99 PhD graduates by 2015
- 1 Licentiate by 2015
- 46 MSc graduates by 2015

They would be trained in the areas of agriculture (9), veterinary sciences (12), technology processing (17), water (18), energy (18), mathematics and statistics (22), education (6), biology (7), medical radiation (6), HIV/AIDS (11), social and human sciences (6), environment and climate (7), library (4), and research management (5).

Basic student data from the 2011-2016 period are listed in Table 4:

Table 4: Targets, Enrolled and Graduated Students in the UEM/Sida Programme 2011-2016 (Source: UEM Cooperation office)

	Targ-ets	Enrolled from 2011	Start before 2011	Drop outs/ never started	11	12	13	14	15	16	11-16	M/F	RSA	Sweden	UEM
PhD	99	47	52	11	2	2	9	4	14	11	42	20 /11	7	24	0
MSc	46	31	5	13	0	0	5	5	9		19	13/6	10	6	
Lic.	1	8	0	2	0	2	2	0	2		6	4 /2	0	6	3
Total	**146**	**86**	**57**	**26**	**2**	**4**	**16**	**9**	**25**	**11**	**67**	**37/19**	**17**	**36**	**3**

The figure for 2016 was obtained from UEM in February 2017, but not broken down by place of studying and gender. The last four columns are therefore based on the period 2011-2015 only.

The original target was to enrol 146 new students. However, several students had not completed their studies in the previous period and were allowed to continue in the next programme. Hence, 57 students from the previous programme period (52 PhDs and 5 MSc) were carried over and included in the current programme (2011-2015). The number of new students enrolled in 2011 was 86, which means that a total of 143 students were enrolled in the 2011-2015 programme (86 new students and 57 old students). After enrolment, 26 students either dropped out or never started. There were hence 119 students actively involved in Master, Licentiate and PhD training, which is one fifth below the original target of 146 (77%).

Out of the 119 students, 67 graduated end of 2016, including 42 PhDs, 19 Masters and 6 Licentiates—or 46% of the original target. None of the PhDs completed by 2015 as expected in the original plan. Only one PhD graduated from the group of students who started in the current programme period (after 2011), while most Master students did. Instead, the PhD graduates were from the group carried over from the previous programme.

The age of students and graduates is missing in the data provided by UEM – so it was not possible to assess the relevance of age. Of the graduates 37 (66%) were men and 19 (34%) were women. In terms of study location, 17 students graduated from South African universities, 36 from Sweden and 3 from UEM (breakdown based on figures up to October 2016). The total number of dissertations expected by UEM in 2016 and 2017 in Sweden and South Africa are as follows:

Table 5: Expected graduates in 2016 and 2017 (Source: Annual Report 2015)

		Degree	2016	2017	Total
1		PhD	37	9	46
2		Licentiate	3	0	3
3		MSc	2	0	2
Total			**42**	**9**	**51**

Effectiveness. The outputs are notably lower than the targets, which indicates that the programme's effectiveness has been low. If and only if a significant number of the expected 51 students will graduate in 2016 and 2017, the completion rate and effectiveness will improve. UEM informed (February 2017) that 11 out of the 37 students graduated in 2016, so the completion rate has somewhat improved.

The large group of PhD students carried over from the previous period (57 students) increased this period's output in 2014 and 2015, but decreases the potential and expected achievement – a total of 146 fresh students. It is particularly alarming that of the 57 students carried over from the previous period only 30 have graduated so far: The remaining students have been funded over two programme periods and have still not graduated. Only one PhD student enrolled within the current programme (after 2011) finished successfully.

Students spent much longer time than originally planned for completing their studies. That increased the costs per student, making less funds available for new students or internal UEM research activities. Among the 2011–2014 graduates, the mean gross time for completing a PhD was 6.3 years, and the most common time (mode) to graduate was 7 years, while one PhD degree took 13 years to complete. The mean for completing a MSc degree was 3.4 years. Reasons for delay will be discussed under efficiency.

The figures above point in the direction of a programme that has been both ineffective and inefficient, albeit with a potential to become moderately effective if a sufficient number of graduates finish in 2017. If 107 students (51+56) graduate by the end of 2017, the final outcome is acceptable (73% of target achieved). However, the high number of students carried over complicates the picture and reduces effectiveness.

Efficiency. When it comes to efficiency, it could be argued that the four-year target time for a PhD is and has been unrealistic for several reasons. Firstly, a large number of students were enrolled, but were not able to start their studies immediately. Secondly, there is a significant difference between the students' gross period of study which measures the total time spent in the programme without taking levels of activity into account, and net period of study which measures the amount of time students actively devote to their studies. All interviews with supervisors and students confirmed that the net period of time for studies is reduced (in particular while in Mozambique) by the need to earn additional income, family obligations, slow

procurement processes, lack of time to do research and a broad range of other legitimate reasons for delays and increase in gross period of study.

In fact, one Swedish supervisor pointed out that "*The aim to graduate within four years is not realistic, not even* [for] *our Swedish students.*" Indeed, the figures from Swedish higher education authority UKÄ (2016) show that roughly half (47%) of all the students in all Swedish universities who started their PhD studies in 2010 had finished in five years. This varied greatly by the field, though, with 60% for agricultural science and 30% for humanities. Of those who enrolled in 2007, 82% had finished within eight years (UKÄ, 2016). In other words, less than half of PhD students in Sweden finished within five years from starting their studies, and one in five did not finish within eight years of studies.

From such a comparative perspective, then, the average of 6.3 years for completing a PhD in the current programme appears reasonable. It might be that the original targets were too ambitious. Be that as it may, in order to improve efficiency, better opportunities for increasing the net period for study are necessary. As the study periods in Sweden were found to be the most productive time for studies and research, increasing that time may decrease the time spent on studies.

It is also interesting to note that efficiency is sub-optimal in Swedish PhD programmes in general. For 2015 Swedish graduates, their gross period of study was 11 semesters (5.5 years), but if one looks at how much of that time was considered active time (net period of study), the median completion was 8.5 semesters—just barely over four years, which is the target (UKÄ, 2016). The same can be argued about Mozambican students: their actual, productive time on study may well be close to four years as there are significant periods of inactivity within the sandwich program (described further in Section 3.4 below).

Looking at training outputs and achievements for the entire 37-year period from 1978 to 2015, a total of 96 PhDs and 55 Masters have graduated as a result of Swedish support. In the same period Swedish support to UEM amounted to approx. 700 Mill SEK—although not only for training, but also for infrastructure and management. It is difficult to estimate costs per graduate due to differences of focus between programme periods, but the programme is by any standard a massive investment in the training of a relatively small number of people.

Table 6: Number of Graduates from Swedish Support Between 1978 and 2016 (Source: UEM Concept note and Cooperation Office data)

	1978-99	2000-05	2006-08	2009-11	2012-16	Total
PhD	12	13	20	20	31	96
MSc	4	3	13	16	19	55
Total	**16**	**16**	**33**	**36**	**50**	**151**

Master programmes

In 2015, UEM offered 54 postgraduate training programmes of which three are Doctoral and 51 Master of Science programmes[16]. According to the Results Framework, UEM had in 2010 30 Master programmes and 2 PhD training programmes. All Master programmes at UEM are to be self-funded, have a minimum of 15 students, charge relatively high tuition, and are only taught as evening classes. Under the agreement between UEM and Sweden, there were four MSc training programmes that got financial support for teaching and research activities as well as for partnerships with Swedish universities.

The four MSc programmes were:

- Master of Science Program in Chemistry and Processing of Local Resources
- Master of Science Program in Food Technology
- Master of Science Program in Mineral Resources Management
- Master of Science Program in Wood Technology

The agreement allowed the activities to start in 2012/2013 and continue over the years with varying number of students in each intake as shown in the table below.

Table 7: List of MSc Courses and Students Funded by Sida (Source: Annual Report 2015 and Cooperation Office)

MSc program	2012	2013	2014	2015	2016	Total
Chemistry and processing of Local Resources	24	15	12	12		64
Food Technology	-	9	17	10		36
Mineral Resources Management	-	14	6	-		20
Wood Processing	-	7	-	7	9	14
Total	**25**	**45**	**35**	**29**	**9**	**134**

The programmes have used guest lecturers from Sweden and other countries to provide courses and supervision. The programmes have supported fieldwork for students, equipment, and study visits. The MSc in Food Technology program sent students to Sweden to conduct a part of the research work at Lund University of Technology and Chalmers University of Technology. For the same purpose, the MSc program in Mineral Resources Management sent some students to Sweden and some others to South African institutions.

[16] Numbers vary, but this number was used in the Annual Report 2015.

The majority of students attending the MSc courses were not UEM employees. They were either staff from other higher education institutions and research institutes or public/private sector employees. Most of the students from the public/private sector hold management and administrative positions, and hence do not necessarily have the experience or incentives to pursue post-graduate studies. In fact, many explicitly stated that their main interest is in the (first year) course-work to enhance their competence, and that the extra year to complete a thesis and get the degree does not really pay off.

Feedback from course coordinators and students on the quality of the four programmes is positive, but there are two challenges. The first challenge is concerned with how many students will eventually complete the Master courses and to what extent the programmes contribute to building a recruitment base for research at UEM. Those items were the programmes' explicit purpose (UEM, Full proposal 2017-2021, p. 3).

The second challenge is concerned with UEM statistics (Informe Do Reitor 2015) on the general number of master graduates, which is very small compared to number of students registered. Assuming a two-year training, the pool of 2480 students in UEM's Master's programs in 2013 led to only 92 graduates in 2015—yielding a graduation rate below 4%. The rate in the four Swedish supported master programmes may be higher, but most, if not all, are part-time students attending evening classes and combining work with studies. For the overall goal of external impact it is commendable that staff from other universities, government departments, and similar institutions are offered training, but it is reducing the value of the Master programme as a research building exercise and recruitment base support for UEM.

Short cross cutting courses

During the period 2013–2015, the Scientific Directorate organised twelve short courses, in different units of UEM, to improve the skills and knowledge of post-graduate students and some lecturers in matters of writing and editing scientific articles and preparation of research projects. The feedback from participants is positive. The demand is high and the Scientific Directorate was urged to organise more courses. There is no data or other information available to assess the relevance and quality of those courses in more detail.

Table 8: List of Short Courses Funded by Sida, 2013-2015 (Source: Annual Report 2015)

Course	Place	No. of participants			Year
		Male	Fem.	Total	
Writing and Editing Scientific Articles	Maputo	17	9	26	2013
Writing and Editing Scientific Articles	Maputo	17	11	28	2013
Preparation of Research Projects	ESUDER - Vilankulo	13	5	18	2013
Writing and Editing Scientific Articles	ESHTI-Inhambane	34	6	40	2013
Preparation of Research Projects	ESNEC- Chibuto	20	5	25	2013
Writing and Editing Scientific Articles	Maputo	-	-	34	2014
Writing and Editing Scientific Articles	Maputo	-	-	40	2014
Writing and Editing Scientific Articles	Maputo	-	-	16	2014
Writing and Editing Scientific Articles	ESCMC -Quelimane	-	-	35	2014
Writing and Editing Scientific Articles	Maputo	-	-	-	2015
Preparation of Research Projects	ESHTI-Inhambane	23	9	32	2015
Writing and Editing Scientific Articles	ESNEC- Chibuto	-	-	-	2015

3.2 UEM'S ACADEMIC PUBLICATIONS OUTPUT 2011-2016

Between January 2011 and October 2016, UEM produced 545 research publications indexed in Scopus, a major bibliographic database of academic research. Those publications consisted of two books, 440 journal articles, 17 book chapters, 25 review articles, 30 conference papers, and 31 miscellaneous academic publications, such as errata and editorials. It is difficult to establish exactly how many of those publications arose from the UEM/Sida programme, but our estimates indicate that approximately half of the journal articles may have been related to the current programme.[17]

Venues. The most common publication venue, with 25 publications from UEM, was *PLoS One*, a well known open-access megajournal that has a broad scope covering all natural science and medicine, and that is characterized by low selectivity (69% acceptance rate in 2013) as well as high publication charges (US$1495 per article). All those 25 articles were from the field of medicine. The next five most common

[17] Our study was able to confirm 42 indexed journal articles from the current programme in 2015, which would yield approximately 200-220 journal articles over 2011–2015. If that estimate were correct, it would constitute roughly half of the university's research output. The estimate is complicated by the fact that a) publishing activity in PhD programmes happens usually at the end of the programme, and b) that many students carried over from previous programme period.

publication venues at UEM were *Journal Of African Earth Sciences* (8 articles), *Malaria Journal* (8 articles), *BMC Public Health* (7 articles), *Journal of Acquired Immune Deficiency Syndromes* (7 articles), and *PLoS Neglected Tropical Diseases* (7 articles). There were some high-prestige publications in high-impact factor venues, such as *The Lancet* (5 articles).

The list of 545 UEM publications consists of articles and other outputs that were published in Scopus-indexed venues, which must meet certain quality criteria. However, that number excludes many publications that are societally important but not strictly academic, such as whitepapers, policy briefs, and various research-based investigations and reviews for governmental and non-governmental organizations and the private sector. That number also excludes articles published in non-indexed journals. Not being indexed in the two major indices—Scopus or WoS—is not a problem in its own right: Some rigorously peer-reviewed, good quality journals are not included in either index. However, there were an alarming number of articles published in non-academic, predatory open-access journals instead of proper academic venues (see Box 2). For an extreme example, five in ten publications (50%) reported by one sub programme in Annual Report 2015 were in venues listed on Beall's list of predatory journals. Some interviewees attributed the problem to lack of awareness about predatory publishers, and showed intent to increase awareness of the issue.

Box 2. Predatory open-access publishers

A new threat to integrity of academic publishing has emerged in the past fifteen years. There has been a quick increase of web-based "journals" that are characterized by rapid publication of articles, high publication costs, practically no quality control, and disregard of peer reviews. Often called "predatory" due to their aggressive e-mail marketing practices, their business model is high volume article throughput with low or no quality control and fees often in excess of US$1000 per article. (Not all pay-to-publish open-access journals are predatory: For instance, PLoS One is a broadly acknowledged, quality-controlled and peer reviewed academic journal that is available online without a fee but collects significant payments from authors.) One of the most comprehensive lists of allegedly predatory journals and publishers is "Beall's List" (https://scholarlyoa.com/). To counter problems with poor quality journals, there are also initiatives to vet and list quality journals, such as the three-level Norwegian accreditation system that is being developed into a Nordic initiative (https://dbh.nsd.uib.no/publiseringskanaler/).

Although publishing in a predatory open-access journal does not make the study itself flawed, those articles often do not pass the usual scientific quality control mechanisms, and should not be acknowledged as scientific publications. On the contrary, publishing in predatory journals has recently become a demerit on academic CV, indicating poor judgment. Similar issue has arisen with "spamferences"—conferences that charge hefty participation fees for negligible academic value.

Although neither problem is limited to developing countries, a recent study (Xia et al., 2015) found that those who publish in predatory journals are predominantly young, inexperienced researchers from the developing world. In addition to risks to academic integrity, the use of official development aid budget to fund dishonest academic publishers is problematic.

Research areas. The breakdown of UEM's publications by subject area (Figure 7) is similar to the breakdown of Mozambique's research output in general—which is unsurprising given UEM's central role in Mozambican research. Medicine and health sciences constituted nearly two in five publications, and agriculture-, biology-, and veterinary-based sciences one in six publications. Many publications belonged under more than one subject category, in which case they were counted in both subjects.

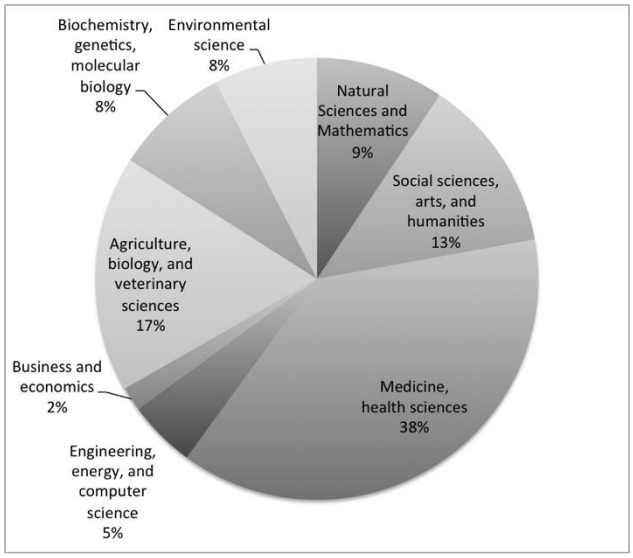


Figure 7: Research Output at UEM in 2011–2016, by Subject Area (Source: Scopus data)

Collaboration Partners. Between 2011 and 2016 UEM publications had co-authors from 133 different countries, although that number is heavily inflated by a number of multi-country studies that involved dozens of countries with one author from each country, and by one 2012 medical study that involved 793 authors, one of whom was from UEM. On a country-level the most active collaboration happened between Mozambique and the United States with 136 joint articles with authors from dozens of different US institutions (Figure 8). US was closely followed by South Africa (122 co-publications), Sweden (96 co-publications), and Portugal (87 co-publications).

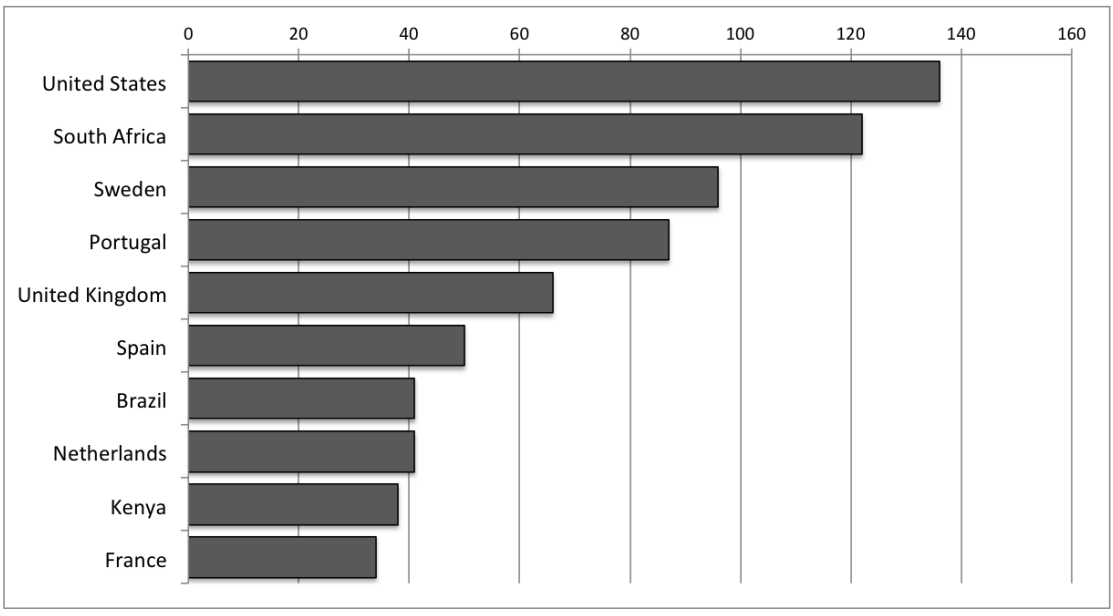


Figure 8: UEM's Publication Co-Authorships by Country (Source: ISI Web of Science)

However, while the United States dominated collaboration at a country level, collaboration with US-based institutions was scattered between dozens of institutions and with varying involvement. On the institutional level UEM's collaboration looks

very different: Of the most active research partner institutions in terms of publications, most are UEM's institutional partners under the current Sida-UEM programme (Figure 9).

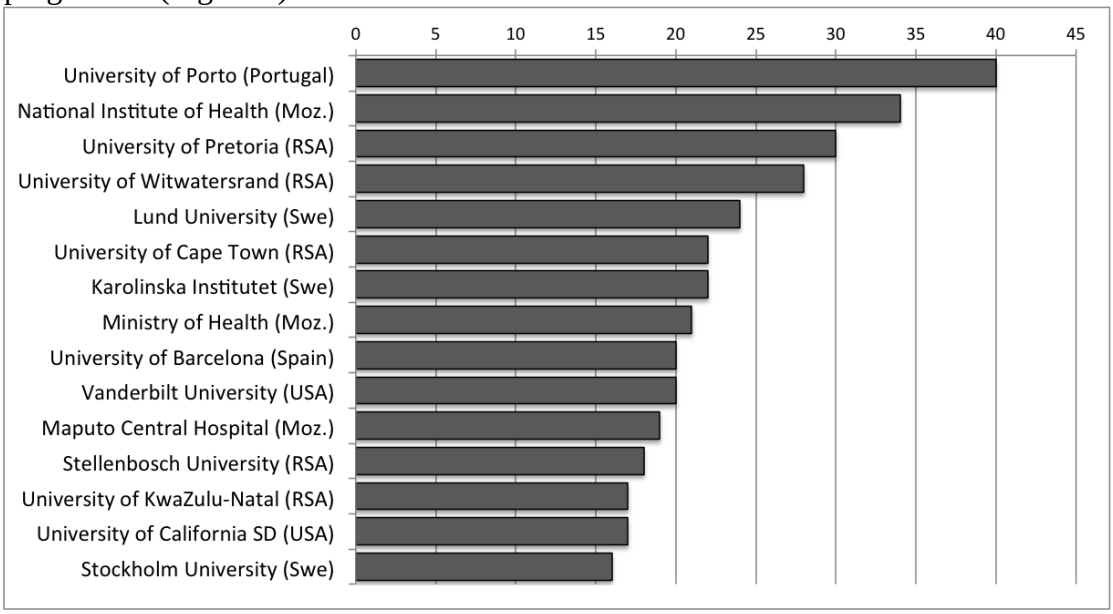


Figure 9: Most Important Collaborating Institutions of UEM in Terms of Publications (Source: ISI Web of Science)

Scientific impact. A common way of evaluating scientific impact of research studies is to look at how often other researchers refer to those studies. The more other researchers refer to a publication, the higher impact that publication is said to have. Although that metric is quite reliable, it also has some issues. Firstly, disciplinary traditions in publishing—such as number of co-authors, self-citing, publication types, and average number of references in bibliography—result in significantly higher numbers of citations in science and medicine than in some social sciences and mathematics. An influential publication in a small field may get fewer citations than an average publication in a popular field. Hence, citations are not here used for comparisons between disciplines. Furthermore, one must be careful when using citations as a metric of impact in an evaluation of recent activities (2011–2016), because it takes a cycle of several years for articles to get read, new research based on them done, and new publications citing those articles to get published.

Two thirds of citations to UEM's research in 2011–2016 came from three journal articles in the prestigious journal *The Lancet*. Those three articles gathered 6703 citations between them, while all the remaining 542 UEM publications had 3115 citations combined. However, each of the three *The Lancet* articles had hundreds of co-authors of whom only one was from UEM, and for that reason they were removed from the rest of the citation analysis.

As the time period 2011–2016 is relatively recent, UEM's average number of 5.7 citations per article is quite good. Especially articles from 2011 and 2012, to which other researchers have already had time to react, have a good average of 13.1 citations

(2011) and 12.6 citations (2012) per publication. There were 207 publications with no citations at all, but two thirds of those were published in 2015 or 2016, so it would not be reasonable to expect them to be cited yet. Only 10% of 2011 publications and 13% of 2012 publications were never cited. Overall, the citation numbers stand international comparison with ease: The world average for articles published in 2011 is 8.3 citations per article, and as a comparison with Mozambique's 13.1 citations per article, Swedish articles got cited 13.8 times per article on average, United States got 11.9 citations, and South Africa 8.6 citations per article. Self-citing rate does not differ remarkably from the world average. Based on the numbers above, Mozambican research is without doubt internationally interesting and gets frequently cited by other researchers.

The current programme. It is unknown how many of UEM's 545 publications in the period 2011–2016 were associated with the current programme. That is due to the reason that there is no systematic, consolidated record keeping of the programme's outputs over the years. Annual reports from 2012 through 2015 are very inaccurate: For instance, while Annual Report 2015 argues that in the year 2015 the programme produced 74 journal articles, that number included unpublished manuscripts, some conference papers, duplicates, previous publications, and accepted articles that may appear at some later time. This evaluation was able to confirm 42 of the Annual Report's journal publications for 2015 (Table 9). The rest were incorrectly reported under journal articles published in 2015. Of the 42 confirmed publications, six (14%) were published in predatory journals (see Box 2).

Table 9: Journal Articles Published Within the Programme in 2015 (Source: Annual Report 2015 with incorrectly reported publications removed)

#	Subprogramme	Journal articles
1	Land use and Agricultural Technologies for Poverty Reduction and Sustainable Development	10
2	Impact of Zoonotic Diseases on Public Health and Animal Production in Mozambique	0
3	Technology Processing of Natural Resources	7
4	Integrated Water Resources Management – Quantitative and Qualitative Aspects of IWRM for Sustainable Development is Southern Mozambique	6
5	Energy Science and Technology	4
6	A Global Research Program in Mathematics, Statistics & Informatics	6
7	Development of Research Culture and Capacity in Education	2
8	Strengthening of Biological and Oceanographic Research Capacity at the Department of Biological Sciences	2
9	Medical Radiation Physics	2
10	Maternal and Child Health in HIV/AIDS High Endemic Area – Mozambique 2011-2015	1
11	Anthropological and Historical Research in Mozambique: From Middle Pleistocene to the Contemporary	0
12	Environment and Climate Research Program	2
13	Consolidation of Access and Use of Scientific Information Sources in Mozambique	0
	Total	**42**

Table 9 above also highlights an issue with the programme's pace of publishing. The minimum number of journal articles per year should be about the same as the number of students in the (four-year) programme, because the minimum requirement for a multiple-paper PhD thesis[18] is typically around four articles. The current programme reached less than half of that in 2015, which is supposed to be the most productive, last year of studies. Although a number of PhD theses were monographs (yielding no articles at all), instead of multiple-paper theses the programme's publication output is still much lower than it should be. Researcher training that involves frequent publication of journal articles, and possibly a multiple-paper thesis, should be encouraged in South African universities due to their many benefits for UEM staff members' future career prospects and researcher training.

Quality measures. The articles published in the programme are too recent for evaluating their number of citations, but the venues in which they were published offers some indication of quality. Journal impact factors (IF) were analysed for a sample of subprograms, and those journals that did not have an IF were looked up in the Norwegian register of accredited journals (see Box 2). As impact factor levels differ considerably between fields, and as journal impact factor does not measure article quality, the example impact factors below should not be used to compare sub programmes, but to open up a discussion on publishing strategies. That being said, high journal impact factor offers some guarantee of quality, as highly ranked journals typically maintain strict quality controls.

Some sub programmes were quite quality-conscious. For example, in one annual report, one sub programme listed 13 journal articles, of which ten were in journals on the Norwegian register of accredited journals, and four were in high quality journals with 5-year (WoS) impact factors that situated them in the highest quartiles of journals in their respective fields (3.581, 3.37, 2.723, and 1.69). Some other sub programmes were not equally selective with their publication strategies. For example, of one sub programme's ten listed publications, five were found on Beall's

[18] In the current programme some theses (mainly those done in South Africa) are monographs, while others are multiple-paper theses. The traditional PhD thesis is a *monograph*; a single book-sized treatment of a specific topic in which most of the material is previously unpublished. In the past few decades the *multiple-paper thesis* has in many fields become the norm. A multiple-paper thesis consists of a number of published journal articles (typically a minimum of four) and a short introduction, summary, and analysis of those articles. The benefits of a multiple-paper thesis are practical: tangible milestones, measurable progress, continuous quality assurance and peer feedback, an early publishing track, experience with how publishing works, early career productivity, and ease of focusing one's research. The beneficial outcomes of a monograph are academic: intellectual depth and breadth, ability to construct a focused and consistent large-scale report, coherence, ability to focus systematically on one issue and study it thoroughly, ability to provide an extended argument not possible over one article-length, and the possibility of extracting several articles out of the monograph after the PhD defense.

list of predatory journals (see Box 2), while others were on the Norwegian list and in WoS, and of the three journals that had an impact factor, one was in the highest quartile in its field (IF 2.386) and two in the lowest quartiles in their fields (1.195 and 0.924). Of another sub programme's nine reported publications, four were published in series not accredited by WoS, Scopus, or Norwegian register, four were in good quality second- and third-quartile journals (IF 0.733, 0.733, 1.627, and 1.150), and one was in a Norwegian registered journal without IF number. However, one cannot draw very strong conclusions from IF numbers, and these findings may tell more about conscious publication strategies and familiarity with bibliometrics than about actual quality of research.

3.3 POST GRADUATE AND SCIENTIFIC RESEARCH FUND

Postgraduate Fund. Funds from the postgraduate fund were intended to support the introduction of postgraduate courses at UEM, as well as to fund scholarships in order to cover fees and fieldwork for PhD and MSc students enrolled at UEM. These funds benefitted not only UEM staff, but also people from outside the UEM. In order to have access to the funds, all selected postgraduate candidates signed training contracts with UEM.

Under the Postgraduate Fund, the number of students that applied for funding were: 93 in 2012, 131 in 2013, 199 in 2014 and 200 in 2015. In 2013, the norms to access post-graduate funds were updated and new selection criteria defined, which were: (i) Research intention; (ii) grade of last degree equal or higher than 14 grade points; (iii) experience in the scientific area assessed through the candidate's curriculum; (iv) age threshold of 40; and (v) monthly salary 25% less than the average tuition fee (applied only to external candidates to UEM). The fund also created a scientific committee in 2013, which was responsible for evaluating the proposals in terms of scientific quality.

Figure 10 below reports the results of the four years evolution of scholarships funded for post-graduate student at UEM. The figure reveals that there was an increase in the number of funded students between 2012 and 2014 and then a decrease in 2015.

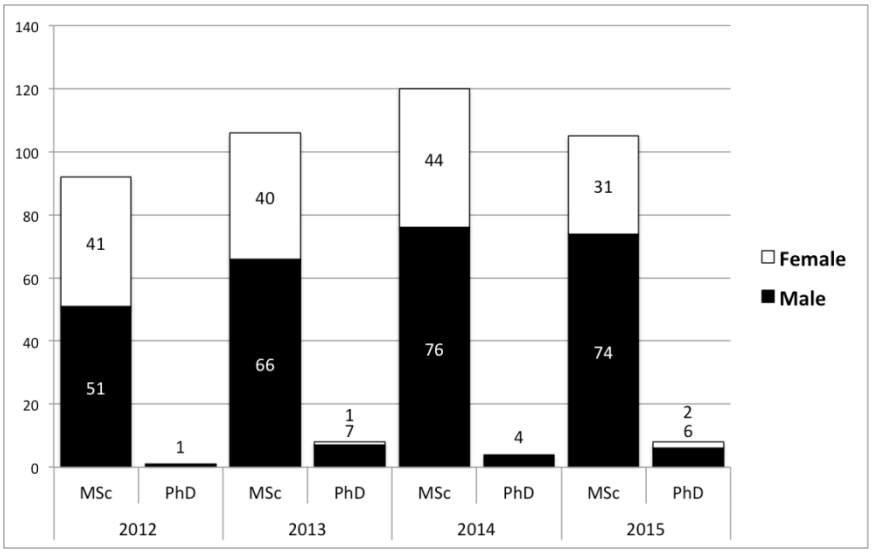


Figure 10: Number of Scholarships Between 2012 and 2015 (Source: Annual Report 2015)

Scientific Research Fund. Funds from the scientific research fund were used to finance small-scale projects. Their main aim was to promote junior researchers to initiate research activities within UEM. The fund provides also support to specific small-scale research projects, encourage research and publishing activity by staff and increase the ability by UEM staff to formulate and run scientific research projects.

During the period 2012-2015 the Scientific Directorate financed 70 research projects. Overall, 65% of the projects in 2013 and 82% in 2014 were reported to perform reasonably well (Annual report 2015), that is, they had spent 50% or more of the allocated budget. The performance of the projects was assessed through the reports submitted by the research groups. In general, 43% of the projects submitted their reports by December 2015 and of those, more than 50% achieved their objectives.

In 2015, for the first time during the period (2013-2015) the Research Fund also supported post-graduate research activities at UEM. Two calls were launched: one in November 2014 and another in July 2015. In total the Scientific Directorate received 80 proposals, of which 66 were approved for funding.

As we shall return to in the final section, there are good arguments for focusing on Research Funds as part of the UEM/Sida programme particularly in order to support/stimulate quality rather than quantity (see also Hydén 2006).

3.4 OTHER INTERVENTIONS

The UEM Library. Support to the library (e-books, journals, books) has been significant and useful, even though the unit is still not sufficiently incorporated into the formal academic structures of UEM and there is still a way to go in terms of creating a "culture" for using the library among UEM staff.

The UEM library has grown considerably, from 20 employees scattered in smaller libraries on the campus in the 1990s/early 2000s to a joint building opened in 2006/2007 and currently boasting 15 qualified librarians and 30 technicians (*técnicos superiores*), 70.000 books and access to 30.000 journals.[19] In addition to the new library building (largely funded by the World Bank), Sweden, Belgium, Netherlands and UNESCO have been contributors.

While the library does not have any problems meeting targets for procurement, budgets etc., the library management complains about the lack of a 'borrowing culture' among staff as well as students. Students do come, but mainly to read their own books/copies and use the internet. A repository for UEM publications should be in place, but is not as the library has not received 'orientations' (from the UEM/Faculty management) and staff simply do not submit what they have produced.

Still according to the library management, the main successes under the 2011-2016 UEM/Sida programme period have been the creation of better organization and systems in the library and capacity building of librarians.

Bunker for linear accelerator. The Embassy of Sweden approved financial support, through reallocation from the Facility Fund, for installation of a donated linear accelerator (equipment for cancer treatment) and construction of a bunker, for that linear accelerator. The idea was to establish an international/regional training centre for technical engineers, physicists and doctors on linear accelerator technology and development of joint research activities. One component was still missing, but could be available from Zimbabwe. However, the accelerator is still not operational so it is not possible to assess the potential financial sustainability of the facility. It depends to a large extent on the design of the training and to what extent it will be attractive for external users.

Marine Biology Research Station at Inhaca. The Embassy provided also support from 2013 on for the development of a strategic research plan for the research station and refurbishment of existing infrastructure and building of new infrastructure. The research is ongoing and the reports state that the infrastructure component has been completed, but it is not possible to assess its financial sustainability (as requested in the ToR).

[19] We were not able to get figures on actual down-loads of e-journals etc.

3.5 DOUBLE/JOINT DEGREES

The long-term objective for UEM is to build local PhD programmes in a large number of fields. A double/joint degree arrangement was suggested in the UEM Concept Note outlining priorities for the period 2017-2027. The new proposal suggests training 96 PhD candidates under double degree or joint degree arrangements, although it uses terminology inconsistently and it does not state whether any agreements exist between the partners. Opinions differ on the added value and challenges of double degrees for UEM and the Swedish institutions. According to one interviewee, although some Swedish universities have on-going double degree arrangements, a national meeting of Swedish higher education institutions had a widespread sceptical stance on double degrees.

There are experiences of double degrees from similar co-operation programmes elsewhere (Kruse, Tedre & Kayobyo, 2014) as well as a plethora of analyses of issues involved on the general level (Knight, 2011). The evaluation of Sida's co-operation programme with Uganda in 2010–2014 (Kruse, Tedre & Kayobyo, 2014: p.39) pointed out a number of benefits as well as concerns regarding double degrees. Under the *double degree* arrangement, a student is enrolled in two PhD programmes in two universities, and when fulfilling the degree requirements of both, gets two PhD degrees for roughly the same amount of research training (using the same thesis) as a regular single-program PhD student gets. Under the *joint degree* arrangement, a single degree is endorsed by two universities. Of these two, the double degree arrangement is much more common.

The benefits of double degrees are clear. The student gets two separate degrees from two countries, which promotes employability and academic recognition. Two independent acceptance processes in different universities provide an additional layer of quality assurance. Meeting two sets of degree requirements typically requires some extra coursework, which potentially increases the graduate's competence. And some students saw added prestige in having two degrees.

Some universities and university departments are keen on double degrees, because both partners get to list that graduate in their own statistics, where PhD graduates are an important metric. Supervisors, for whom PhD graduates are an important career merit, often welcome the concept, because they get to be the main supervisor for that institution. For Swedish universities it is financially beneficial since the student is registered and graduates in Sweden.[20]

[20] Assuming that the funding in Sweden would be the same as now with a double degree model.

However, there are also concerns about getting "two degrees for the price of one". The concept raises both legal and ethical questions: how many PhD degrees should one be allowed to get for the work of one? If two are allowed, there is no reason why three or four would not be allowed. Many students questioned the added value of double degrees: "*Double degrees sounds nice. But do people ever ask you … does it ever matter where you got your PhD? For a student what matters is where you get the knowledge* […] *and what knowledge you get.*"

Common issues also involve timing (academic calendars), national regulations (prohibition from taking several degree programmes at once), language of study, quality, accreditation, workload, increased bureaucracy, and institutional costs (Knight, 2011). Interviews with Swedish universities showed that despite some benefits, Swedish universities had various doubts and had in many cases rejected the idea earlier.

Joint degrees, where a single degree is awarded by two institutions, evades many legal and ethical issues of the double degree, but introduces different ones. Knight (2011) pointed out that as national regulations usually do not allow universities to jointly confer qualifications—especially with foreign institutions—a joint degree might not be duly recognized in either country. Joint degrees were almost unanimously rejected by interviewees:

"Joint degree: You can just forget about it. Some Swedish universities say no to double degrees [too]. Most others aren't interested in double degrees for individuals, so it should be at least for large numbers of students. It takes at least six months to set up double degrees." (Swedish coordinator).

4 Programme and Research Management

While the overall management structure at UEM has a considerable impact on the outcome of the UEM/Sida programme 2011-2016, the programme has limited direct interventions in the areas of strategic planning, change management and reform with the partial exception of support to the Cooperation Office (Research Management, Training in Research Management, see Annex 5). This section starts by an evaluation of overall UEM and programme structures, and continues with the management of the research programmes, research funds, master programmes and the central library that have been directly targeted in the programme (see Annex 5). The organogram for UEM is presented in Annex 6.

4.1 CENTRAL UEM MANAGEMENT

Eduardo Mondlane University is a complex structure formally headed by a University Council (*Conselho Universitário*), a Rector and two Vice Rectors for Academic Affairs and Administration and Resources respectively. There are 28 Directorates and Offices at central level, 11 faculties, 16 schools of applied science and 8 research and advocacy centres. There are also 135 undergraduate and 80 post-graduate programmes, commonly linked to individual departments. The current number of academic staff members is 1790 and the number of enrolled students is 39,078, giving a staff-student ratio of 1:22.

The number of UEM units, staff and students has grown significantly particularly since the mid-2000s, but without really changing the overall management structure, which remains very centralised. The University Council is headed by the Rector, and has a total of 27 members of which five are external (government and civil society). The Council of Directors (*Conselho de Directores*) is a consultative organ for the Rector, and it primarily treats financial and administrative issues. The Academic Council (*Conselho Académico*) is headed by the Rector, consists of the pedagogic and scientific directors and elected members from the staff, and primarily treats academic issues such as new courses and curriculum development.

The councils are relatively large bodies (up to 50 members), with limited real decision-making power. The daily management is largely carried out by the Rector through a weekly meeting (*Despacho Semanal*) with the two vice-rectors and people in central management units depending on the issues at hand. Key persons are the heads of the directorates of finance, pedagogics (for graduate studies), science (for post-graduate studies), human resources – and the Cooperation Office that coordinates donor engagement. Donors – with Sweden being the most important

followed by Italy and Belgium – have one formal meeting with the top management per year. This meeting primarily consists of the Rector reading the UEM Annual Report, with limited room for dialogue and discussions. The combination of the 'top heavy' management and a 'decentralised' academic structure with staff describing the Faculty as their 'institutional home' has an impact on the institutional coherence and effectiveness of management also of the UEM/Sida cooperation programme.[21]

4.2 OVERALL MANAGEMENT OF THE UEM/SIDA PROGRAMME

From the Swedish point of view, there have been two important changes in the management of the programme since the initiation of the 2011-2016 programme period: One is the transfer of responsibility from Sida in Stockholm to the Embassy of Sweden in Maputo, and the second is transfer in Sweden from involved individual universities and departments to University of Uppsala's International Science Programme (ISP) with one main coordinator for all Swedish collaborating institutions of all sub-programmes.

The first change is largely seen to have improved Sida's institutional knowledge about the programme and made it easier to maintain contacts with relevant actors and stakeholders in Mozambique. While the number of formal meetings between Sida as donor and UEM and ISP has remained the same with two annual consultations (for planning in October and review in May respectively), the informal contacts have increased particularly with the Cooperation Office. However, while the Embassy states that it would have liked to be more involved in as well as better informed about the overall management of UEM and how the Swedish support fits in, some interviewees in UEM find the Embassy to be too 'hands on' and that management and reporting should be more "result-based" with a "performance contract".

The concentration of the coordination of the programme at ISP, Uppsala University is largely seen to have improved the practical administration and 'streamlining' of the Sweden/UEM collaboration, both by involved Swedish academic staff and by

[21] At the same time UEM is considered to be a 'politicised' university, partly stemming from the fact that the Rector is directly appointed by the President (i.e. in line with ministers). This is currently accentuated by a strife between the Frelimo Government and the Rector related to disagreements over honours made to a diseased and controversial UEM staff member, which has made the future position of the current Rector uncertain (the Rector was eventually approved for a new term in December 2016). Moreover, the Frelimo Party seems to have enhanced its influence at the university through its party cells (Faculty level) and Party Secretariat (central level). According to interlocutors, the political impact has increased with President Gebuza and President Nuysi after a period under President Chissano with a more 'technocratic' approach and non-interference.

Mozambican researchers. The coordination rests very much on the relation between the heads of ISP and the Cooperation Office, and is – in addition to formal agreements - based on an informal 'agreement' on how to communicate between the two. While effective, such a relation is also vulnerable to the extent that little is done/no major decisions made when one or both of them are not accessible.

The divisions of responsibilities between the Mozambican and Swedish partner institutions are laid out in the document "Standard Operating Procedures for Research Capacity Strengthening at UEM – Programme Supported by Sida for the period 2011-2015" – with lists of responsibilities for all institutions and units involved except Sida and the Embassy itself. While clearly spelt out, none of the interviewees referred to the document, and it does not seem to be an "active" document of reference.

Box 3: Donor roles

The donor plays different roles in development cooperation in general and in a capacity strengthening programme such as the current, including:

- Financier – providing financial and material resources.
- Controller – monitoring that the programme is implemented according to plans.
- Operator/capacity builder – producing or contributing to produce something – a policy, a training programme, teaching, supervision etc.
- Network builder – bringing in new actors for strengthening a programme by building national and international alliances.
- Strategic or visionary – bringing in ideas about overall change in direction and substance of the programme.

What roles have the Swedish actors played in the current programme? The donor has clearly played the roles of financier and controller, providing financial resources and monitoring narrative and financial reports from UEM as well as keeping up a continuous dialogue and resolving implementation problems. ISP as well as Swedish and South African universities have been operators and capacity builders involved in the implementation of the training programme. They have also played a role in extending international networks, even though this seems mainly to have been done by UEM and UEM's researchers themselves. It has been more difficult to ascertain the Swedish strategic contribution to the overall design and evolution of the programme beyond the bureaucratic and administrative requirements (Kruse 2016, Exploring donorships). Sida, the Embassy of Sweden, and Swedish universities receive, review, and react to proposals from UEM focusing on the individual components of the programme, but there could have been a stronger and more systematic effort to discuss the direction and evolution of the programme – now into its 38th year.

At UEM, the formal responsibility for the UEM/Sida cooperation programme rests with the Vice Rector for Academic Affairs and the Vice Rector for Administrative and Resources Affairs. Both strongly underline the importance of the programme for UEM both historically and in the current and upcoming phases. However, as is to be expected, ambitions of the heads of academic affairs are not always in line with those of the unit responsible for financial issues.

The responsibility for the daily management of the programme, as well as that of other donors, rests with a management team comprised of the Cooperation Office, the Scientific Directorate, the Finance Directorate and the Internal Audit Unit. In practise, the key person is the head of the Cooperation Office and his staff of ten people, with no real decisions being made without his involvement. The Cooperation Office is considered effective by both Swedes and Mozambicans involved in the programme. The Cooperation Office on its part argues that while relations with the Embassy and the Swedish counterparts function well, there are continued challenges with the lines of reporting internally with the faculties, departments, program coordinators,

supervisors, and students. The Cooperation Office does not have the authority or power over sanctions to instruct sub- programmes to comply. This is, according to the Cooperation Office, the main reason for the considerable delays in the production of annual reports to the Embassy of Sweden – where neither the 2014 nor the 2015 reports were finalised at the time of the evaluation (November 2016).[22]

Donor coordination

While Sweden has been and is the by far most important donor to UEM, also Italy, Belgium, the World Bank and the Netherlands have a history of cooperation (Figure 11). As the second most important donor in terms of funding, Italy has worked with capacity building mainly in agriculture, physical planning, and biotechnology; secondments of Italian teachers; a cross-cutting programme on environment; and capacity building at central level (Scientific Directorate and Office for Academic Quality Assurance). Belgium currently has a five-year programme worth 2.8 million Euros focusing on multi-disciplinary research projects in human rights, social protection and gender in addition to programmes on HIV/AIDS, biostatistics, and academic English.

The World Bank does not fund UEM directly, but in the form of system wide support through the Ministry of Education and Human Development and the Ministry of Science and Technology, Higher Education and Technical Professional training. Their main support is to the National Research Fund. Other recent projects include support to the National Council for Quality Assurance, rehabilitation of the UEM central library and the Faculty of Engineering, and a regional Centre for Excellence in Oil and Gas, at UEM.

Except for the annual meeting, the last one in June 2016 with a focus on investments in infrastructure, between UEM and donors mentioned above, real coordination beyond sharing of information between donors seems to be limited.The MCTESTP has recently developed a dialogue mechanism with development partners, and higher education donors lead by Italy have been meeting regularly since mid-2015. However, real coordination of/between donors seems to be limited and UEM has not taken the driver seat to make it happen**.** Some in the UEM management argue that the most effective way to coordinate donors would be through “donor basket funds”.

[22] The reporting from each project and upwards in the system is done with the help of templates with the main headings i) Objectives, ii) Results, iii) Budget, iv) Publications and Activities, v) People Trained – and should in the outset be simple to do.

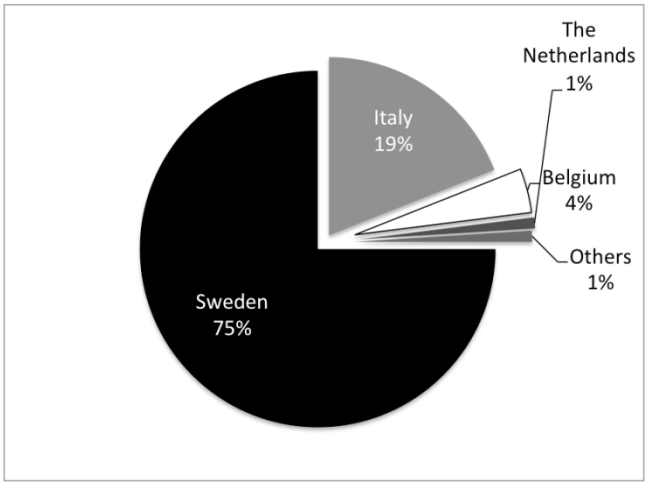


Figure 11: Total UEM Donor Contributions 2015 (Source: Informe do Reito, 2016)

4.3 RESEARCH MANAGEMENT AT UEM

The Scientific Directorate. Research management at UEM is vested in the Scientific Directorate, with the main responsibilities being i) to coordinate UEM's strategic plan for implementation of research, innovation and extension; ii) to ensure dissemination, implementation and monitoring of UEM's research policy; iii) to ensure the development and implementation of regulations for all scientific activities, including innovation, extension and post-graduation; iv) to promote opportunities for research and innovation, extension and post-graduate training; and v) to promote research and innovation excellence. The directorate is also responsible for the management of the two research funds discussed in Chapter 3 as well as the Research Management Fund, Training of Research Management, and the Facility Fund – all of which have been underutilised in the current programme period (Annex 4). The Scientific Directorate has a staff of 15 members, of whom four are senior.

According to the unit itself, it has formidable challenges, including inadequate staff, lack of innovative management systems, insufficient coordination with other relevant central units, and limited relations with academic units at UEM as well as poor responsiveness from those units. The directorate also acknowledges that *"The capacity to do research is still incipient in the institutions* [i.e. UEM]" and that *"there is low engagement of PhD and Master Graduates to pursue research projects".*

Among the achievements of the Scientific Directorate during the period under evaluation are the production of a number of policies and regulations ,[23] and the organisation of short-term courses for students and staff on issues such as project management and academic writing (including English). In terms of UEM publication policies, these are outlined in the "Publication Policy at Eduardo Mondlane University" from 2015 and adhere to normal international standards including intellectual property rights. The directorate has also introduced prizes for publications as incentives, but the result of this is still pending.

In reality, the management of research at UEM is still primarily vested at the individual faculties, schools and centres through cooperation programmes such as the one with Sweden. Some of these units are large (faculties have up to 8,000 students) and have a long history of being semi-autonomous teaching and research institutions, while others (such as School of Arts and Communication and School of Sports Science) are recently established and would need direction and guidance.

The Scientific Directorate has submitted a proposal for "Research, Extension and Post-Graduation Management" for the new programme period (2017-2021). It is very ambitious – and probably unrealistic – by not only proposing consolidation and improvements in current areas of central management responsibilities, but also by suggesting new areas such as a Scientific Park and the establishment of Centres of Excellence. It seems more important to consolidate and improve on current activities and responsibilities.

Research proposals. Also the development of research proposals is largely decentralised to the individual departments and faculties, often in cooperation with other universities and colleagues. The lack of an internal culture for making institutional priorities between research programmes and proposals is illustrated by the submission of proposals for the upcoming Swedish supported programme for a total of 800 million SEK despite the cap of 325 million SEK (described by one interviewee as evidence that UEM is "*immature*"). In cases where funding is sought from the National Research Fund or the UEM-based funds, the application proceeds from the relevant faculty into a review process with internal as well as external reviewers.

[23] These include the documents "Research Lines at Eduardo Mondlane University" 2016; "Publication Policy at Eduardo Mondlane University" 2015; "Normas do Fundo de Aquisição e Manutenção de Equipamentos" 2013; and "Regulamento de Financiamento de Participação em Eventos Científicos" 2013.

There are also differences in the extent to which individual projects and researchers cooperate with other units at the same faculty. Some programmes lend themselves to cooperation, while others are by their very nature more specialised. What seems clear, as judged from the very limited number of interdisciplinary publications as well as interviews, is that cooperation across faculties (such as Faculty of Science and Faculty of Social Science) is very rare – despite the fact that interdisciplinary research is a stated objective for the university as well as for the upcoming cooperation period.

Quality assurance. Until recently, quality assurance was not institutionalised at UEM beyond activities at the individual faculties and departments, and it was not a part of the UEM/Sida programme. However, partly at the initiative of the National Council for Academic Quality (CNAC) work was initiated in 2013 at UEM for establishing a separate Office for Academic Quality (*Gabinete para a Qualidade Academica*) using government and Italian funding. Its mandate is accreditation of UEM units and courses, based on a broad set of 'domains' including: i) mission statement, ii) research management, iii) curriculum iv) student body, v) faculty/staff, vi) technical and administrative staff, vi) research and extension, vii) infrastructure/equipment, and viii) internationalisation.

In 2015 self-evaluation of UEM MSc courses started – including those involved in the UEM/Sida programme – based on a common manual dated May 2015 (*Manual da Auto-Avaliação dos Cursos de Pós-Graduação*). Three BSc courses self evaluation reports were submitted to the CNAC, which organised external evaluation teams that also visited the relevant departments and units. Accreditation was based on levels (A to C), with the idea being to give accreditation for a longer period of time (up to 5 years, level A) or shorter (but at least 2 years, level C). Internally at UEM, the process was followed up by an improvement plan for the relevant faculties and central directorates (*Plano de Melhoria Central para o período 2016-2020*). Funding for its implementation was secured by the UEM state budget and at central level partially by Italian cooperation), but the process was 'caught up' by the political and economic crisis mentioned earlier and execution has been low.

However, the work did result in a Summary Report (*1^0 Ciclo de Auto-Avaliação dos Cursos da UEM. Relatório Global*), with findings under each of the eight domains listed above. In general terms, the staff are relatively self-critical about the running of their own units and the university as a whole, measured in term of "degree of satisfaction" and assessed in terms of a SWOT (strengths, weaknesses, opportunities and threats) analysis (Figure 12). Also students are relatively dissatisfied, both with the academic and social support offered (see Figure 13).

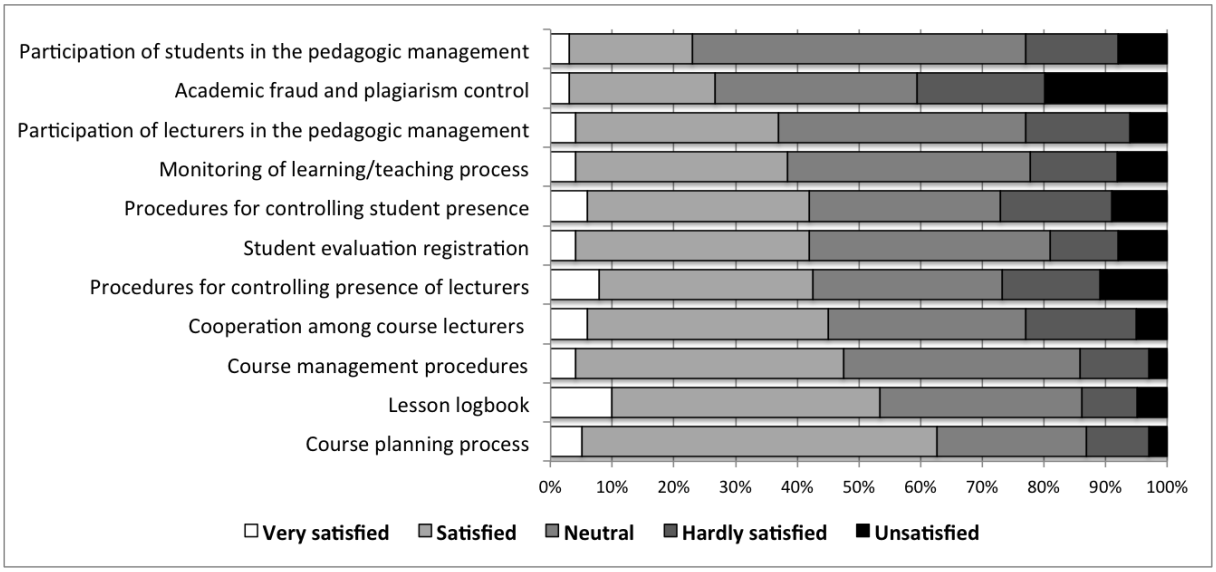


Figure 12: Degree of satisfaction among academic staff about academic management at UEM

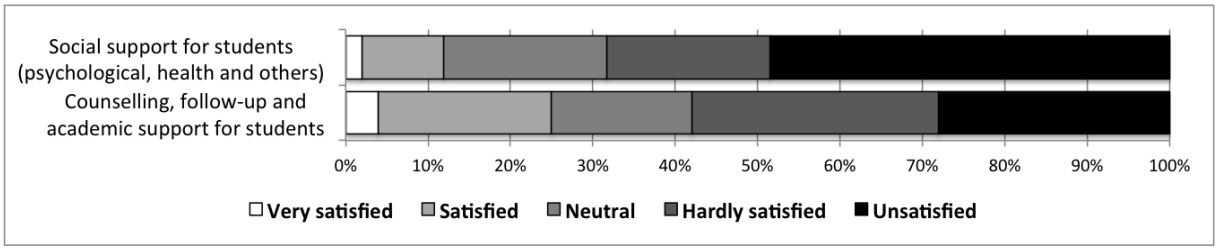


Figure 13: Degree of satisfaction among students about academic and social support at UEM

Gender Policies. UEM's has a formal policy to combat gender inequalities among its academic staff, among students in general and in specific disciplines such as the sciences – formulated in the "First Strategic Plan of UEM" from 2008 (see Box). However, the document has been very difficult to get hold of, is short (two pages), and contains very general statements without concrete steps of implementation. The only concrete follow-up that this evaluation was able to identify is a Plan of Implementation from UEM's "Centre for Coordination of Gender Issues" dated 2009. Notably, the "Standard Operating Procedures for Research Capacity Strengthening at UEM" agreed upon by Sida/the Embassy and UEM does not contain any references to women empowerment or gender equality.

Strategic Objective 8 UEM: To guarantee gender equity

1. Ensure equal access to UEM courses
   a. Mobilise the university community to become involved in awareness-raising campaigns in society, especially at secondary school level, on the importance of women's participation in higher education
   b. Achieve a balance in the quantity and quality of accommodation for students of both sexes.
   c. Create conditions for supporting student mothers so they can progress and successfully conclude their university courses
   d. Combat all form of sexual discrimination in the teaching process

2. Guarantee gender equity in all university activities
   a. Improve women's access to science, technology and management posts
   b. Ensure women equal progression and development in the career structures and equal access to post-graduate scholarships.

A separate Gender Unit was established in 2009, with a current staff of 10 people. Its objective is to support the University in implementing government gender policies and international conventions, and to ensure that the staff composition and courses/curriculums are gender balanced and sensitive. They also carry out teaching and research on gender, including on domestic violence and discrimination/harassment in academia, and run what is said to be a mandatory course in gender sensitive pedagogic practises.

Despite this, men continue to dominate both UEM academic staff (73.2%) and the proportion of students at the University (65.7% in 2015). There is only one woman (the Vice Rector for Academic Affairs) in the UEM top management. Among students, the exceptions to male dominance are the Faculties of Education and Medicine where 57% and 51% respectively are women. On the other end of the scale, the proportion of female students is 12% in the Faculty of Engineering, 19% in the Faculty of Architecture and 24% in the Faculty of Sciences. There has only been a slight increase in the share of female staff and students since 2011 (UEM 2016).

The continued gender imbalances has deep socio-cultural roots in Mozambique, reflecting the unequal relation between men and women in society at large and in the domestic sphere as well as the lower primary and secondary school participation and graduation rate among girls. There has been an increase in the proportion of girls/women applying to UEM since 2011 which indicate change in society at large (see Chapter 2.3), but this is as noted in Chapter 2.3 not reflected in actual admission rates.

For women who have managed to become staff or students, there also seems to be hindrances in terms of career development. While the interviewees included a number of well qualified and vocal female staff members and students who do well, many women complain that they meet obstacles in terms of options for own career development as well as internal promotions. In particular, women face difficulties in being able to go abroad for studies – often meeting resistance both from their own families who see this as a violation of their domestic responsibilities and from colleagues who do not like to see that women 'rise above them'.

"Men adapt better. They take it lightly. Women focus on studies, but think a lot about the family (children, husbands, parents). It becomes heavier for them». «Sometimes women want to leave, husbands do not want to. However, a man does not need approval. A woman runs the risk of losing her husband". "If the man leaves, they say he is taking care of the family. However, some men are open-minded and let their wives study». «Some husbands feel humiliated if their wives have more qualifications than they do".

Another issue that has been raised is the age requirement for entering the program (maximun 40 years). This affects women disproportionately. Due to their internalised family duties, they tend to postpone further studies until their children are self-sufficient. By the time their life-situation makes it possible, they might not be accepted into the programme any longer. Not being able to increase their qualifications constitutes one more impediment for promotion or career progression.

However, there are indications of change. Younger female candidates with no families of their own – some of them admitted through positive discrimination – fare quite well and feel equal, qualified and entitled to any award received. According to the gender coordination unit, a follow-up study conducted among medicine students found that the young women were performing exceptionally well and contributed towards gender equality in the faculty.

4.4 THE SANDWICH MODEL

The training component of the programme comprised of postgraduate training of UEM staff members abroad (Sweden and South Africa) and in Mozambique, as well as development of postgraduate training at UEM. The PhD training was conducted mainly using the sandwich model, particularly for those students enrolled in Swedish institutions, while the study model for those enrolled in South African Universities followed either sandwich or full-time models. In the sandwich model, the training period is divided between time spent in Mozambique and in the collaborating country. Field research and collection of data are typically carried out in Mozambique. The portion of time spent in Sweden or in South Africa is dedicated to taking courses, conducting laboratory experiments, and writing up the thesis and papers for publication. Master degree training, however, was only done on the full-time model at all Swedish and South African Universities as well as at UEM.

The sandwich model for training MSc and PhD students was built on cooperation between UEM, South African and Swedish universities, and it provided Mozambican students with international exposure and training in high-standard academic research environments. As such, it has been instrumental for high-quality training, introduction to another culture, and exposure to different ways of organising and conducting research and education. Many interviewed PhD students, who had held teaching positions at UEM before taking PhD courses in Swedish universities, reported that the experience had permanently changed their view of quality teaching.

The interviewees identified both positive and negative aspects with the sandwich model. On the one hand, being in Sweden was unequivocally perceived to be the most productive time of the whole programme, and the facilities, face-to-face supervision, and coursework were considered to be essential for success, along with a more leisurely "*possibility to have people walk and discuss with you critically things you're doing*" (PhD student).

On the other hand, the periods in Mozambique were usually perceived as time wasted by students as well as supervisors—except for medicine and other fields such as education that rely on local data collection, where periods in Mozambique were considered essential. Due to different needs between projects and stages of projects, students as well as supervisors argued for increased flexibility over when students should be in Sweden and for how long.

Delays were often explained by time spent in Mozambique, described as "*the most unproductive time*" for some and very productive for others. One student and one supervisor called it a "four-month vacation" while another student characterized it as hard labour at the university with no time for PhD studies at all. Another reason mentioned for delays was procurement: "*It's not only UEM but the rules of Mozambique that slow down everything*" (PhD student). Getting things working was characterized as an extremely bureaucratic operation.

Supervision. Each student was supposed to have supervisors both in Mozambique and in Sweden or South Africa. However, the capacity for supervision at UEM was still low, and the system with Swedish main supervisors and Mozambican co-supervisors was only in few cases effective in terms of communication, transfer of knowledge, and institutionalisation beyond the programme. Communication over distance was often problematic: For instance, one PhD student described, "*Whenever I write to the co-supervisor, there's not a single e-mail back. They don't take any responsibility*." Generally the opinion was that face-to-face co-supervision works much better: "*When I'm in Mozambique it's fine. When I'm* [in Sweden] *we don't communicate at all. He doesn't respond to e-mails or responds too late. It's very difficult. The Mozambican supervisor's role isn't what I expected*" (PhD student).

Most Swedish supervisors and PhD students were not content with the commitment and quality of Mozambican supervision. The issues are rooted in poor planning of the partnerships: co-supervisors were often asked to supervise fields that were outside their own expertise. Given a poor fit between co-supervisors' expertise and project topics, the role of Mozambican supervisors was often that of mere providers of administrative assistance. One PhD student argued, however, that students' own initiative may be instrumental for a well working collaboration: "*What I learned from my first bad experiences is that you have to involve both supervisors from the start. … You have to be active yourself.*"

In some cases, the value of Mozambican co-supervision was even perceived to be negative because it slowed down the process. There were complaints that students sometimes had to wait several months before getting any feedback on papers, which delayed their progress. The situation was not, however, all that negative in all areas: Intensity of collaboration between Swedish and Mozambican supervisors and co-supervisors varied from a complete lack of collaboration to well integrated international research teams. Yet, overall the experience was too often mostly negative:

"I still don't understand the deal between the Swedish and Mozambican supervisors. There is a lack of motivation from the Mozambican side. I really don't understand the problem, why are they not motivated. My friend also says Mozambican supervisors have no involvement." (PhD student)

Conflicts of staff interest. Swedish universities have professional and to some extent also financial incentives for maintaining the current sandwich model. Departments are rewarded for PhD graduates, and Swedish supervisors (in particular young supervisors) benefit from the current arrangement in terms of PhD graduates and co-publications, which promote career advancement. For that reason Swedish supervisors strongly preferred to be main supervisors:

"If you ask a Swedish supervisor if [he/she] can take this PhD student from Mozambique and the student will graduate from Sweden, it is often OK. If you say that the student will graduate from Mozambique, the answer may be different. Some will say there's no benefit for us. If it's a young scientist, [he/she] says I need to be main supervisor for my CV." (Swedish supervisor and coordinator)

While the motivation above is chiefly instrumental, there were also more altruistic motivations ranging from improved quality of research to the chance to help colleagues from a developing country. One Swedish supervisor argued that motivations may change over time: "*Younger PhD holders in Sweden want something to put in their CV. But those older people from Sweden have other motives, too*." A supervisor maintained that some supervisors might be attracted to the chance to travel to Mozambique, while others may see the same as a deterrent and waste of time.

A possible shift towards UEM-based PhD degrees requires careful thinking about non-monetary incentives if the programme plans to continue with Swedish university collaboration. In absence of other incentives for Swedish partners, it is not straightforward to shift to a UEM-based doctoral training model with Swedish co-supervisors, if Swedish supervisors and departments feel they lose their main incentive of getting their "own" PhD graduates to be included in their own annual reports. Some interviewees, however, pointed out a variety of benefits aside from publications and PhD degrees:

"I see many benefits for us [Swedish partner]: networking, possibility to address frontline issues in this research area. The Swedish setting is rather small in respect to competences. In this supervision, we have one from KI, two from Uppsala. We have to really join forces this way. Sweden is too small to have capacity in global health issues just on its own." (Swedish supervisor)

The lack of incentives in terms of career advancement was clearly visible at UEM, where co-supervisors felt that they did not benefit from the current system. Co-supervisors argued that they are not given credit for their co-supervising role to an extent that makes it visible on their CVs. Again, Mozambican students often considered the UEM supervisors' academic contribution to be minimal. The situation might be reversed between Swedish and Mozambican supervisors if Mozambican supervisors were main supervisors and Swedish supervisors assumed co-supervisor roles. There were also differences of opinion and misunderstandings concerning the financial contributions given to Swedish supervisors: For Mozambicans it was largely believed that Swedish supervisors receive a salary top-up for their supervision work, while in reality the funds for Swedish supervision are paid to the department, which then assigns working hours to supervisors.

Although especially PhD students favoured the idea of UEM-based PhD programmes, there was a nearly unequivocal feeling among interviewees that UEM is not yet ready to take over PhD training in most fields: "*In UEM Faculty of Medicine they have not until now an environment with enough quality for a PhD degree*" (PhD student and a faculty member). The problem in many fields started from a substantial lack of basic training: "*If you want to shift the operations to the Mozambican side, there are some subjects that need heavy support from Sweden, and others that cope better. They need to have well-developed MSc programmes to start with*" (Swedish supervisor). On the positive side, degrees from one's own country would not require accreditation to be recognized: "*From a practical point of view it doesn't matter where you get the degree. I would still prefer a Mozambican degree. A degree from UEM would easier be recognized by the Ministry of Education*" (PhD student). Yet, despite their wish to see UEM-based training in the future, the interviewed students almost unanimously supported Sweden-based training for the time being.

Position of students. The way in which Mozambican students are enrolled in Swedish universities puts them at a very different status and role compared to the other PhD students. While other doctoral students are typically employees of Swedish universities (as junior researchers), due to their external source of funding the Mozambican students' status was that of a visiting researcher, which excluded them from most of the ICT systems for budgeting, financing, and information channels, for instance. That caused a real barrier to transparency, and it created feelings of being treated differently or even unfairly. Many students felt that they received too little information about their own funding and financing. The lack of transparency regarding students' budgets was a recurring issue, and students knew very little about where "their" money was being used. That lack of transparency

makes it nigh impossible for students to independently plan their own projects: "*I'm not well informed about my budget, what I've used, what I can use, conferences I can attend. We need more open discussion, transparency, on students' budgets*" (PhD student).

Among students in South Africa, their position largely depend on their own initiatives and the type of relations they managed to develop with their South African supervisors. Some of our interviewees were pleased with the quality and follow-up once they were accepted (which often took a long time and considerable efforts mainly from the student him/herself), while others argued that they were largely treated as "any student" and that their special challenges (such as language and economic situation) were not taken into consideration by the South African university and supervisor.

Interestingly, the sandwich programme did not greatly affect students' career prospects at UEM. PhD students typically did not have very ambitious ideas about their career after the PhD. Most students expected to return to their former jobs with updated skills and knowledge. However, many students mentioned that exposure to different kinds of teaching and doing research had completely changed how they view good teaching, and said that they will bring those ideas into their own teaching practice, too.

4.5 FINANCIAL MANAGEMENT

The total budget for UEM in 2015 was 3,379.55 million Meticais or almost 45 million USD, of which 72% came from the state budget, 16% from university's own income (*receitas próprias*) including the surplus brought forward from 2014, and 12% from donors (Figure 14; UEM 2016). By the end of the year, 92% of the budget had been spent, with the university explaining the underutilisation of funds with i) the poor capacity of the various institutions to generate own income and ii) the rigid regulations of donors. Of the funds utilised, 62% were spent on salaries, 24% on running costs and 14% on investments. While all state funds were utilised, only 57% of the donor funds were made use of. This is explained by UEM with reference to i) the fact that many projects run for several years, ii) excess zeal in the utilisation of the funds, and iii) the rigidity inherent in the agreements (UEM 2015)[24].

[24] In Portuguese: (i) o facto de estes fundos cobrirem projectos plurianuais com execução em dois ou mais anos, (ii) o excesso de zelo na utilização dos fundos e, (iii) a rigidez no cumprimento dos acordos celebrados.

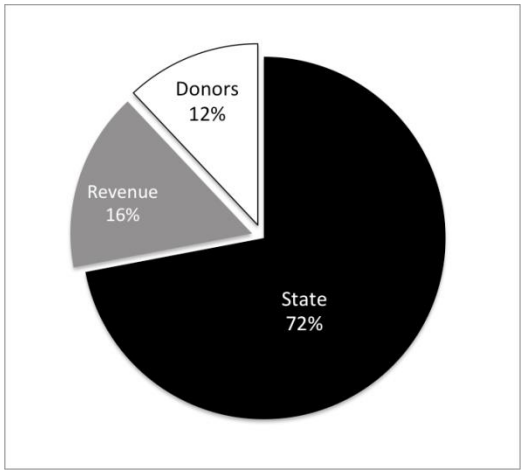


Figure 14: Sources of UEM Budget 2015 (Source: UEM 2016 – Informe do Reitor)

In terms of the internal financial control system, external as well as internal audits are regularly carried out. The same external auditor is used for a maximum of three years as a measure of security. Comments from external auditors have for the last years been mainly minor issues related to procurement, travels, and seminars – none of which according to the Director of the Internal Audit unit reflect any suspicion of corruption or serious financial irregularities. According to the Director of Finance, the main challenge for UEM is to find new and creative ways to mobilise financial resources, with professors and researchers being active fundraisers.

Financial management of the UEM/Sida programme. The financial management of the programme has historically been decentralised at the different faculties and departments both in Mozambique and Sweden, which has at times turned out to be highly problematic (Alberts et al. 2003). With the more hands-on engagement following from the "decentralisation" of responsibility from Sida in Stockholm to the Embassy of Sweden in Maputo and the centralisation of administrative responsibility in Sweden to ISP, Uppsala University financial management of the programme seems to function well.

For Sida as donor, the main challenge is related to late, weak, and inadequate reporting in annual reports. Most data and information is at activity and output level, with much less on outcomes and short-term impacts. There is no systematic use of performance indicators for monitoring the progress and achievements of the programme at output, outcome and impact levels.[25] Analyses of strengths and

[25] The use of performance indicators for capacity builling at all levels would have helped both UEM and the Embassy to trace progress and take remidial action at an early stage.

weaknesses are inadequate, and annual reports contain incomplete and misleading summaries of publications. Following from this, it is often difficult to understand the aggregate outputs for the entire programme period. Late reporting has compelled the Embassy to pay out new disbursements before all narrative reports have been formally approved (and avoid cuts in budgets for the programme the subsequent year). There are also issues around special types of procurement, such as the purchase of cars, which according to UEM are followed particularly closely by the Embassy.

In Sweden, the ISP does not seem to have particular problems in following up budgets and payments. Funds are transferred directly from Sida to ISP based on programme plans and budgets developed by UEM, in collaboration with Swedish collaborating institutions, and approved by the Embassy. There are issues related to specific costs for immigration, formalisation of residence permits, study permits, and insurance, but in the form of workload for ISP rather than financial issues per se. There are also positive examples of flexibility, such as the discovery that insurance for students was significantly more expensive in Mozambique than in Sweden, after which the programme made the necessary steps to transfer the purchase of insurances to Sweden.

At UEM, programme funds are currently channelled through the UEM Finance Directorate (using a separate bank account for Swedish funds), but administered by the Cooperation Office – with the goal being to include the Swedish funds in the state budget as part of the State Financial Management System (SISTAFE). The main challenge in terms of financial management is related to procurement, where UEM has to comply with the cumbersome Mozambican national rules using inadequate or poor quality equipment, which leads to long delays. Direct purchases from abroad, notably South Africa, can only be done if the internal processes of tendering has proven that equipment are not available in Mozambique or through Mozambican import companies.

There are variations between the different sub-programmes in terms of financial management and expenditures (see Annex 4). This can usually be explained with reference to procurement and other tangible issues, except for two sub-programmes: Training of Research Management (Programme 17) and the UEM Facility Fund (Programme 19), which had hardly any activities during the period 2011-2016.

The programme documentation does not include systematic efforts to estimate and compare costs between the three training models—sandwich training in Sweden, training in South Africa, and training only in Mozambique. This evaluation was not

able to obtain exact figures, but the following estimates are based on figures from ISP and the UEM Cooperation Office[26].

Table 10: Average Annual Costs for Training of One PhD Student (in SEK) (Source: ISP and UEM Cooperation Office)

	Sweden	RSA	UEM
Swedish universities (supervision, visits to Mozambique , overhead)	250 000		
Student expenses[27]	490 000	190 000	10 600[28]
Total	**740 000**	**190 000**	**?**

It is no surprise that the Swedish model is the most expensive – almost four times the cost of training a student in South Africa. There are clearly non-monetary values for both Swedish universities and Mozambican students being in Sweden, but a regional or national training model would be the most cost effective, graduating many more students for the same amount of money. The South African universities involved in the programme are also well established and found in or around the top-500 lists of world universities. However, it is not clear whether the recruitment base in Mozambique or at UEM would permit a significantly extended training programme in South Africa.

Box 5. International Comparisons

In 2012, expenditure per student on tertiary education and research varied in higher education from just under 8,000 USD adjusted for purchasing power in Turkey, Chile, Mexico, and Estonia to just over 25,000 USD in the US and Switzerland. The average total expenditure per student in the OECD was 15,000 USD and in Sweden 22,500 USD or approximately 180,000 SEK (Higher Education in Sweden 2016). One Swedish university estimated the average cost of four year full-time doctoral training to 3.5 million SEK, or 875,000 SEK per year, including salaries, social charges, university overheads, student mobility, materials, and other costs. Self-funded students in Swedish universities would pay approximately 10,000 SEK per month for living and studying costs.

[26] Figures based on data provided by UEM and cannot be verified by the evaluation team.

[27] Includes travel, subsistence, insurance etc. for being in Sweden and South Africa.

[28] Based on an average of 90 000 MZM per year, but the figure varies between faculties and unlike the two other models, does not include living expenses.

4.6 OVERALL PROGRESS OF THE PROGRAMME

The Swedish research cooperation with Mozambique was initiated already in 1978. The proposal for July 2017–2022 programme introduces a gradual, but modest shift towards building research training capacity on-site at UEM and reducing the dominance of Swedish universities in the sandwich model. However, there is no clear plan or strategy for how to change the Swedish sandwich programme (with Swedish main supervisors and graduation in Sweden) to a capacity-strengthening programme for UEM, in which UEM would take full responsibility for supervision and graduation.

Any long-term capacity strengthening research programme should over time evolve towards increasingly advanced stages. In order to illustrate one approach to programme evolution, the following five stages sum up the current status of the Swedish supported programme and provide a basis for our recommendations in the subsequent section – with the programme currently finding itself in many ways stuck at the second level.[29]

Stage 1: Initially, there is a need for academic training of individual researchers, especially in the form of degree programmes, and for upgrading of laboratories and equipment in basic science fields. The training is based on a sandwich model, where students are registered, spend time, and graduate in institutions outside Mozambique. The main supervisors are external, while UEM provides co-supervisors. The university does not yet produce extensive research outputs, but the foundation for more research and publication is in place.

Stage 2: At this stage, the international sandwich model continues, but capacity for local supervision and MSc and PhD training at UEM is increased. Recent PhD graduates strengthen the university's MSc training capacity, and there is an increasing number of capable PhD co-supervisors who have a proven track record in academic publishing. More responsibility for supervision, programme and financial management is transferred to UEM. There is an increasing focus on research management training and continued support to infrastructure, including electronic services and access to journals and e-books.

[29] The approach is based on Boeren et al. (2006), but changed and further developed for the purposes of this evaluation. The stages illustrate the evolution of the programme and not the types/levels of capacity strengthening introduced on p. 2 of the report.

Stage 3: At this stage, UEM has taken over full responsibility for training MSc and PhD students in Mozambique. There is a sufficient number of experienced research project leaders capable of coordinating research projects and providing main supervision for doctoral students. Swedish and other partner universities have changed roles and provide capacity strengthening support to UEM through, for instance, joint curriculum development, conducting short courses, and co-supervision. Mozambican students can also attend courses abroad. Direct support to infrastructure and management is phased out. High-level strategic support to UEM is offered through, for example, peer exchange with other universities or specific and limited technical assistance.

Stage 4: UEM sees a reduced need for research training programmes, and the laboratories have become much more satisfactory, although progress in research may call for some additional equipment. The need for funding for active research, for example by newly returned PhDs, is increasing. Such funding is given through small grants and the National Research Council. The projects are becoming more productive. The number of national and international research partners is expanded and departments set and meet goals and standards for publishing in international journals. Graduate programmes are established or upgraded, in cooperation with other academic milieux in the country that work in a similar field.

Stage 5. Finally, the university has become a strong and independent institution. The cost of the research activities may increase. UEM consistently wins research financing from national, regional, and international public sources, industry, international organizations, other bilateral donors, through MSc or PhD programmes, or through loans from development banks. With their documented productivity and experience in proposal writing and winning funding, the successful projects will be increasingly competitive.

Moving between stages necessitates shifting modalities of support. Doctoral training is an essential component of Stage 1, but its importance decreases towards the higher stages. The higher-level stages require increased support to curriculum design, supervision, independent research, academic leadership, research project management, and grant-writing. The current programme's implicit theory of change explained in Chapter 2 (Table 2) may assume and expect too much of doctoral training.

The evidence collected for this evaluation places UEM between stages two and three in the model above, although in most fields it leans towards stage two. It could be argued that after Sweden's long-term support, the cooperation should be at a more advanced stage. There are several reasons for the slow developments, but Sida and UEM could have prepared a phasing-out strategy and concrete plan, explaining the expected stages and requirements for moving from one stage to the other.

5 Wider Effects

5.1 TRACING RESEARCHERS

What happens to graduates after graduation is a measure of success of the training programme. This chapter examines the mobility of PhD graduates funded under the UEM/Sida programme to build institutional research capacity in Mozambique based on (a) a study covering the period from 1990 to 2013 (Fellesson and Mählck 2013) and (b) a more limited study carried out as part of this evaluation focusing on graduates from 2013-2016.

The study by Fellesson and Mählck (2013) found that the great majority (72%) of post-1990 graduates were still employed at UEM in 2012.[30] Similar findings were made by ISP in another tracer study (not covering UEM), which found that 92% of graduates from supported groups and networks are working in their home countries and a majority of them are employed at universities or research institutes (ISP Tracing ISP Graduates 2008-2013). The often higher salaries paid by the emerging private universities seem not to have influenced the choice of workplace. Despite a decade of rapid expansion of higher education institutions, only a small proportion (7.1%) of responding graduates were employed by other universities than their own in the country. This lack of external and internal mobility is interesting and contradicts other studies, which report massive brain drain and migration of African skilled scientists and experts (Africa Capacity report 2016, p. 17).

Most PhD graduates also remained in the same position they had held before entering PhD training. Many respondents brought up the fact that the training had not led to career advancement in terms of higher positions. Many lecturers asserted that the

[30] The total research sample is based on a survey of 159 individuals who had either graduated from the Swedish–Mozambican PhD training programme or were involved in it in 2013. The response rate was 51.6% (82 individuals). Women represented 40% of the survey sample. The respondents were drawn from a variety of scientific disciplines, including the humanities, social sciences, natural sciences, medicine and technical sciences, and were included in the survey with a view to mapping their mobility and career rationales. The statistical sample covers the period 1990–2013.

PhD degree had served an important function by increasing their status as researchers, and given the limited time and resources available, to also undertake some research. The great majority of surveyed graduates with positions in academia had continued to do research in varying measures and all respondents expressed a strong desire to continue doing research. Among those reporting external support for research, 56.3 % of the funds came from international donors, followed by international research foundations (23.7%) and the government (20.0%). Close to 47% of responding graduates with positions in academia reported some form of research collaboration with partners outside Mozambique.

A majority of respondents stressed that their PhD training has had a great impact on their lives, both professionally and personally. The main source of supplementary income was consultancy work in combination with teaching at private universities. Even those who had not climbed the career ladder still felt their status in society had changed and that they could engage in intellectual settings with greater confidence.

Criticism was raised in the Fellesson and Mählck study (2013) concerning the selection of relatively old candidates as a result of formal and informal seniority rules. A majority of respondents started their training before the age of 41. There was, however, significant variation in the representation of women and men in the three age categories between 25 and 40. Men seem to start their doctoral training earlier than women, with a high representation of men in first two age categories, while a majority of women were found in the third category. In addition, a significantly higher proportion of women started their training between 41 and 45 – which is apparently no longer possible.

In addition to previous tracer studies, this evaluation measured the continued research activity of the current programme's graduates[31]. The results did not strongly support the earlier tracer studies' reports of continued research activity: Of the seventeen graduates who received their PhD degrees between 2011 and 2014, six continued to publish academic articles two years after their graduation. The first year after graduation was excluded because it is common for manuscripts that are included in a PhD thesis to appear the following year. Publications that appear at least two years from the graduation can be considered to be independent from the graduate's PhD training program. Five graduates published one article each, and one graduate published two articles. In other words, there is evidence of post-graduate research, but relatively modest. This is problematic as doctoral training is essentially meant to be

[31] To increase the scope of this part of the evaluation, results from the standard indices Scopus and Web of Science were amended by findings from the less selective academic search engine Google Scholar.

research training: It aims at preparing PhD graduates for research careers, and the years immediately following one's PhD are important for building up a research career.

More tracer data

This evaluation conducted a supplementary tracer study among PhD graduates between 2011 and 2015. A questionnaire was sent to 31 graduates and 29 responded (94%) – 20 men and 9 women. The findings confirmed to a large extent findings in the previous study by Fellesson and Mählck – the low horizontal and vertical mobility. Data showed that[32]:

- The average time for completing the PhD studies was 5.75 years and main reasons for delays were:
    - 55% practical challenges
    - 28% other conflicting duties at UEM
    - 17% professional challenges
    - 0% personal challenges
- The large majority is currently employed at UEM:
    - 14% are working full time to fulfill postgraduate obligations
    - 76% are working full time on a permanent basis
    - Only 7% working outside UEM (in the public sector)
- The large majority is also primarily involved in teaching and only one in research:
    - 90% teaching
    - 3% research
    - 3% technical work
- Few could confirm that they were involved in much research:
    - 3% were full time researcher
    - 31% were doing research half time
    - 55% did some research
    - 10% did not do any research.
- Most of the respondents stated that the studies had been useful in preparing them for their current position:
    - 86% to a large extent
    - 10% to some extent
    - 3% marginally
- Most of the graduates were also satisfied with their current job:
    - 31% very satisfied
    - 41% fairly satisfied
    - 17% somewhat satisfied
    - 10% not satisfied

[32] Not all alternative responses are included, which explains that all categories do not add up to 100%.

- The PhD training had primarily contributed to strengthening academic and applied research skills:
    - 62% academic skills
    - 28% applied research skills
    - 3% teaching skills
- Almost all believe that they will find themselves at UEM and in Mozambique in five years:
    - 82% at UEM and in Mozambique
    - 14% outside Mozambique
- The majority also believe that they will be in the same type of employment, but possibly in other positions at the university:
    - 30% (8) in the same type of work
    - 44% (12) in other positions at UEM

5.2 APPLICATION AND USE OF RESEARCH

The potentially most important overall effect of the Swedish research cooperation with UEM – and the one most emphasised by Sida – is the general value of having a well-educated (that is Master and PhD) section of the population that over time will benefit the society at large. However, except for their role in teaching younger generations of academics who will go into positions in public, private and civil society institutions, it is difficult to monitor or verify such a claim. One attempt is done by UEM itself, by presenting the names of 'well-known and influential graduates' at their web-page.[33] The list includes:

Alumni Eduardo Mondlane University

Carlos Agostinho do Rosário – Prime Minister
Luisa Diogo – Former Prime Minister
Mari Alkatiri – First prime Minister of Independent East Timor
Mia Couto – Internationally Renowned Writer
Paulina Chiziane - Internationally Renowned Writer
Daviz Simango – President of MDM
Agostinho Mondlane – Minister in various sectors

[33] The only figure that was clearly available was information in *UEM 2016. Research Lines at Eduardo Mondlane University* which states that "between 2011 and 2013, UEM undertook 213 university extension services" (p.12).

Interviewees external to the university (see Annex 3) do not consider UEM in general, including the components supported by the UEM/Sida programme, to be an important or critical voice in Mozambican society or public debate. Our impression is that this is the combined outcome of a lack of incentives, internal fear to speak out in the name of UEM or as professionals, the focus on basic and physical sciences at the expense of social sciences in the programme, and the dearth of relevant channels and venues for dissemination.

While the general media and press are still relatively open in Mozambique, there are no real venues for academic opinion-making with the partial exception of internal UEM publications such as the *UEM Revista Científica* that are easier accessible for the general public than international ones. It was established in 2011, and has released three series namely i) Biomedical Sciences and Public Health Series, ii) Arts and Social Sciences Series, and iii) Education Sciences Series. UEM has also institutionalised a biannual Research Conference with the objective of disseminating UEM scientific work to an external audience.

Looking at external dissemination from the individual Sida-supported research programmes, there is evidence that a critical mass of researchers is emerging in some research areas – in particular medicine, agriculture, engineering and energy – which in the outset should be relevant to needs in Mozambican society. However, there is no systematic data and information on wider effects (outcomes and impact beyond the university) in annual reports or other relevant reports from the research programmes or as part of UEM's general dissemination strategy (for example through its internet page).

The most informative and accessible source of information is probably the Boletim Informativo de UEM, which is usually published monthly and covers internal as well as external UEM events. In the June 2015 issue, for example, there is an article in which the Governor of Gaza refers to the positive implications of the UEM School of Business and Entrepreneurship established in her province, but where she also requests a stronger UEM involvement in the development of Gaza at the community level. There is also a link to "UEM in the News" (UEM na Imprensa), with copies of media coverage of the university.[34]

There are a number of examples of individual research projects being relevant, applied, and used in society (including in the area of technological innovations), even though these are neither more widely disseminated nor systematically monitored for

34 A separate UEM web-page entitled UEM Notícias (UEM News) is not functional (http://www.uem.mz).

the purpose of ascertaining long-term effect on development or poverty reduction. Box 6 below lists some of the projects that UEM staff members have highlighted during the course of the evaluation.

Box 6. Examples of academic/applied projects by UEM/Sida programme

- Research on two parasites in cattle that can be transferred to humans. In some communities people drink from the same water source as cattle, and the research will be used to develop preventive measures.
- Research on tropical fruit conservation, helping communities to preserve fruit for times of scarcity and possibly also for agro-based manufacturing industries
- Research on new modes of processing mafura oil (Trichlia emetica) currently only consumed in parts of the country, for nationwide mass production or consumption (current modes of processing are toxic)

The most direct external impact of UEM academic staff is through double employment and consultancies. This is very widespread, although the prevalence differs between different faculties and departments. The internal UEM argument for this practise is that it is useful for professional reasons in order to get exposed to the "real world" and access data, as well as necessary in order to top up salaries. While a number of public sector employees work for UEM as lecturers, UEM staff tend to work for the private sector either in a part-time or consultant capacity, or by owning and managing their own private companies.

An important negative implication for UEM is that staff members are frequently absent, have less time for research, and are less focused on their teaching responsibilities.[35] Attempts have been made to regulate and formalise the practise through the establishment of a separate UEM Consultancy Unit, but the arrangement does not function in practise. The wide-spread acceptance of the practise is exemplified by the fact that in the current evaluation many senior UEM staff members produced business cards of their own companies or other private companies rather than UEM cards, apparently without any hesitation whatsoever.

External perceptions of the relevance and quality of employees and services from UEM staff vary considerably. A common perception is that they tend to be too "theoretical" and without a sufficient practical orientation – which of course is a criticism raised against many universities. Another is that while they may be good at doing the research work for the consultancy, they are much less competent in writing reports particularly in English. And thirdly, complaints were raised that many who are

[35] Some Faculties/Departments are more affected by the culture of consultancies than others. Some interviews indicated that the Faculty/Department of Economics hardly has any staff member permanently positioned at UEM, and others that the Department of Anthropology is dependent on external lecturers in order to fulfill the department's teaching obligations.

hired for special short-term assignments and consultancies tend to be unreliable as they have too many projects going on at the same time.

Box 7. Quotes from External Stakeholders on the Relevance and Quality of UEM

- Students trained at UEM are not prepared for Mozambican realities. What they learn does not take the Mozambican context into account. […]. There is a huge gap between what they learn and what they need.
- They [students from UEM] have relevant knowledge and the right background and experience – local knowledge combined with a theoretical background.
- The students [from UEM] cannot analyse a problem and write. They come from an oral tradition, and their reports have no logic and coherence.
- Their main constraint is report writing. Many have problems writing a well-structured report in English and need a lot of help.
- The quality of graduates from UEM is going down. There is not sufficient competition.
- There is a lack of vision and independence at UEM.

One of the most important messages from external stakeholders is that applied research, methodology, and reporting research may be given inadequate attention at UEM. At the same time, of course, UEM staff leaving the university to work outside academia learn to apply their research within the requirements and expectations of their new jobs in the public, private, and civil society sectors. In any case, more systematic work should be done by UEM to collect and distribute publications from applied research and consultancies – both for learning and to be able to more systematically account for its wider effects on society and poverty reduction.

6 Conclusions, Lessons Learnt and Recommendations

6.1 CONCLUSIONS

Relevance. The Swedish support has been highly relevant for UEM's research policy and Mozambique's science, technology and innovation strategy (MOSTIS). Sweden's long-term commitment has provided UEM a comprehensive package of support, which first focused on individual capacity building, and subsequently also on strengthening management competence and capacity. The support has been significant in real terms as part of the UEM budget, as well as in comparison with other donors. These key strengths represent significant added value to the overall programme. The selection of thematic areas and an STI profile are well in line with UEM's priorities as well as the national higher education and research priorities in Mozambique. While important and justified by national priorities, this profile selection may have been at the expense of the university as a critical voice in Mozambican society that social sciences and humanities may be in a better position to provide.

The funded research programmes and projects do to some extent – directly but mostly indirectly – support national social and economic development and contribute to poverty reduction. However, it is too early to ascertain the overall academic and societal implications of having highly educated university staff with research and teaching responsibilities and functions in public and private sectors. So far, UEM's role for national social and economic developments has been inhibited by the combination of the large proportion of researchers remaining in academia and the limited public engagement with research findings.

The sandwich programme has responded to the university and individual researcher needs, in particular during the period of post-graduate education. Conditions for research at individual UEM faculties have improved, but in practise doctoral students as well as recent graduates face difficulties in prioritising research during and after their studies.

However, the programme has not been adequately designed and followed up for addressing broad strategic reforms and development at the university level, or for higher education and research reforms on national level. The notion has been that well qualified university staff will lead to better management and improved overall quality, while one could argue that this would have required the involvement of professional, qualified academic managers. Doctoral training is basic researcher

training and does not target management, teaching, coordination, grant-writing, supervision, or leadership.

Efficiency. The programme has not been optimally efficient for several reasons. Firstly, there are still long delays in implementing the programme, PhD training in particular, which reduces efficiency. The reasons are many, but one of the more important reasons is that most students are only part-time students, and combine their studies with teaching, consultancy work, or other income-generating activities. Master students go to classes and study in the evenings. When students are in Sweden and South Africa they are able to study full-time, but while in Mozambique their progress is often halted by their teaching duties and involvement in administrative matters at the university. Furthermore, no rules and sanctions against delays are enforced. Students not completing on time or progressing successfully are not systematically monitored, interventions are rare, extension of study period is near automatic, and there is no clear limit to how many years of delays will be accepted for completing a PhD or MSc. Despite those shortcomings, the average length (number of years) of successfully completed PhD studies is not unusually high by international comparison.

Secondly, the total cost of the programme and costs per student in the sandwich mode are high compared to the relatively low outputs so far. Cost-efficiency may improve, even dramatically, if the projected number of students will finish their studies in 2017. The UEM procurement system also poses a serious constraint on programme efficiency. Procurement of necessary equipment for research training is systematically delayed, making it difficult to complete studies on time.

Thirdly, the involvement of Swedish universities and researchers has been efficient and important also for the Swedish counterparts, but the efficiency of the dual-supervisor system is undermined by uncertainties with the role and status of Swedes and Mozambicans as main- and co-supervisors as well as with research topic selections outside co-supervisors' expertise. The large majority of co-supervisors at UEM do not provide sufficient support and guidance while students are in Mozambique, which further delays the process of completing studies.

Effectiveness. The programme supported by Sweden has trained a sizable group of UEM staff members to the highest academic level and provided international exposure and experience, with very low level of competence at the outset. However, original targets for PhD/Master graduates are far from being met. If a significant number of PhD degrees are granted in 2017, effectiveness will be acceptable. There is little doubt that the significant research capacity building at UEM would not have taken place to the extent achieved without Swedish support.

Almost all trained staff members have remained at UEM, both during the compulsory period following graduation, but also after it. This reflects a general trend of repatriating Mozambican researchers, caused by UEM's status as the only university in Mozambique with satisfactory opportunities for research as well as the conditions

that the university offers in terms of salaries, benefits, and options for traveling, among others.
The programme has contributed to building a critical mass of researchers in selected thematic areas and faculties, e.g. medicine, which is an important prerequisite for UEM's explicit vision of becoming a research based university. The effectiveness of training from the perspective of UEM is, however, diluted by the widespread tendency of newly trained researchers to discontinue publishing activity after their graduation. Time spent teaching is still extremely high and opportunities for doing research are few, which makes cultivating a research culture slow and challenging. Time spent teaching could be reduced by planning and implementing teaching differently.

Overall, the strongest effects can be found at the individual level – in training staff and researchers to a high academic standard – while the effects on the research environment (organisational and institutional impact) are less prominent.

Sustainability. The academic and institutional capacity for sustaining the activities at UEM without Swedish support has improved, but the likelihood of financial and to some extent managerial sustainability for continued research training and funding post-Swedish support is still weak. The research grants have contributed to encouraging research at UEM, but with small resources that only work as seed money for research programmes that should seek external funding for continuation. However, UEM has not increased its capacity to independently attract national and international funding for research. The external donors and patterns of funding have remained the same during the period, but government support to research has decreased. The main post-graduate collaborators continue to be from the university where the student graduated, but there is an increasing number of examples of extended collaboration networks.

Complacency and dependence on one major donor may be a challenge for UEM and Sida, with the former arguing that research activities in the relevant areas of support will virtually stop should the support be discontinued or significantly reduced. Little attention has been given to an exit strategy or systematic reflection on how the co-operation should develop in the future. Stages will not happen by default, partly because of inertia and conflicting interests.

6.2 LESSONS LEARNT

The interview data and other sources point towards several lessons learnt. Those lessons learnt can be analysed in terms of the programme's implicit theory of change (Chapter 1) as well as the following five assumptions – the relevance of which should be re-evaluated in the future programme periods.

- Assumption 1: Highly qualified individuals are the key for achieving long-term results. Doctorate holders are the most qualified in terms of educational

attainment, and they are also at the forefront of innovation and well positioned to drive advances in science, technology and knowledge about society.

- Assumption 2: Training of individual researchers has to be supplemented with investments in research management and infrastructure in order to be sustainable. This should include research and training funds as well as support to library for scientific information and dissemination. Together, these will contribute to the establishment of research environments that will be attractive work places for researchers (Sida 2015).
- Assumption 3: To strengthen national research capacity, each country should have at least one university capable of establishing and expanding national research and higher education. The training of PhD graduates constitutes a core component in achieving the capacity to formulate and conduct research of high quality and relevance (Sida 2008 Research guidelines).
- Assumption 4: The sandwich approach is believed to promote capacity-strengthening beyond individual researchers, by gradually transferring responsibilities, administratively and substantively, from the Swedish counterpart to the partner in the collaborating country.
- Assumption 5: A strong university with good management and a competent academic staff will make it possible to plan and use research in the fight against poverty by contributing with scientific knowledge in relevant areas and supply society with a highly qualified work-force.

This evaluation report has discussed and questioned several of the above assumptions. The findings and lessons are also used to inform future recommendations:

First, the programme sees PhD training as the main foundation for building research capacity. The confidence in this resource-intensive investment in single individuals continues in the new proposal from UEM (2017-2021, page 15) despite the introduction of research groups and a more programmatic focus. However, PhD training is researcher training, as opposed to training for research leadership, education, supervision, grant-writing, administration of research projects, or management of research groups. In order to avoid inflated expectations, it is important to keep in mind what doctoral training is aimed at achieving. *Lesson 1: Doctoral training is not a silver bullet solution that could initiate transformative changes at the university-wide scale.*

Second, the support to one national public university to avoid fragmentation and dilution of support makes good sense at the initial stage of support, but after funding the same university for nearly four decades, and with the substantial development of the country's university sector in terms of competing public and private higher education institutions, it is important to reassess that assumption. *Lesson 2: Continued support of one single institution risks complacency and may be detrimental to diversity and competition.*

Third, the transition from a Swedish based sandwich training and transfer of responsibilities to UEM is a complex process that does not happen automatically, without explicitly planning for it. In the current sandwich mode, there is no clear transfer of good supervision practices and little evidence of co-supervisors learning to become main supervisors. A shift towards UEM-based doctoral training will face resistance due to conflicting interests, and a new capacity development model requires different sets of skills and attitudes from the Swedish partners as well as new incentives for both sides. *Lesson 3: Learning efficient supervision practices does not happen automatically through co-supervision, without explicitly planning for it.*

Fourth, the programme has become more holistic and comprehensive, but there are levels and aspects of capacity building not yet well covered – at least not in terms of activities and budget lines. Funds are available for training of research managers in order to reform and strengthen research management, but managerial change and organisational development require more than making funds available. Managerial issues need to be addressed in a multifaceted manner and in their own right. There are several possible levels of intervention to strengthen capacity, including: (a) individuals, (b) research groups, units, or faculties, (c) the entire university as an organisation (d) links with other universities in and outside the country, (e) the institutional framework (policies and strategies) and finally (f) the national framework of higher education and research (see page 2). The bulk of Swedish support in the current programme goes to (a) and (b), but (c) and (d) are only supported to some extent or indirectly. The support does not, or does only marginally, influence the two highest levels of capacity strengthening: strategic reform and development and national frameworks for higher education. *Lesson 4: Each level of capacity building has a saturation point, after which diminishing returns should alert programme developers to shift efforts to the next levels in development.*

Fifth, the ultimate goal of contributing to produce and use research in the fight against poverty may make it necessary to reassess the current strong focus on the sciences at the expense of social sciences (including political science and economics). Increased focus on social sciences and humanities is in line with Mozambique's Science, Technology, and Innovation Strategy (MOSTIS) as well as UEM's research policy. *Lesson 5: Poverty is a multidimensional problem, which necessitates multidisciplinary solutions.*

6.3 RECOMMENDATIONS

Sweden has, over a period of 38 years, provided UEM an amount in excess of SEK 702 million - a long period of time and large amount of money. In the initial phase, support was directed towards development of research capacity through individual research projects and training of researchers abroad. Since the early 1990s, the cooperation has been broadened and focused on institutional and research capacity building mainly at UEM.

Despite the incremental changes over the years, the focus of the programme has remained, firstly, on research and capacity building at UEM through international doctoral programmes in sandwich mode, and secondly, on strengthening of research management and provision of literature, equipment, and ICT services. After such a long time, it could be argued that the programme should have reached a crossroads.

For the future of the programme to be supported by Sweden, it is essential to discuss how the research cooperation with Mozambique can be improved and made more efficient, and how the programme can be designed in order to encourage critical thinking and innovative processes. As the upcoming programme (July 2017-2022) has already been largely defined (UEM 2016), the following section presents some immediate recommendations that can be implemented during that programme period. But at the same time, there is a need to make fundamental strategic choices for a programme that will have run for 43 years at the end of the next programme period. Those choices are presented in the second part of this section in the form of four alternative scenarios for a possible continuation post-2022.

Short-term interventions. The following recommendations are made with reference to the topics listed in the Terms of Reference in Section 5. Some of the questions listed in the ToR are excluded as they do not relate to recommendations, and some have been merged as they relate to the same issue.

1. How can the present research cooperation with Mozambique be improved and made more efficient with regard to overall goals, financial/research management, programme coordination, and scientific goals?

The overall goal of the programme should be moved from its current primary focus on PhD/Master graduates towards a stronger emphasis on planning, management, and reform in order to consolidate the research training that has been carried out. This can be done by giving priority to proposals for the new programme with such an emphasis. If this is not done, most rewards of the expensive training are not cashed in.

The financial management of the programme seems to function well with the establishment of the Coordination Office at UEM and ISP as coordinating unit in Sweden. Internally at UEM, the reporting procedures should be simplified with

clearer reporting templates and deadlines to avoid delays. Monitoring and evaluation cannot be done when even the most basic data is not available. In Sweden, the complaints by Mozambican students about inadequate information concerning their economic rights and obligations should be looked into.

The management and coordination of research at UEM finds itself in a limbo between the Scientific Unit that is vested with the formal responsibility, but widely seen as having inadequate competence and capacity, and faculties and departments that most staff members see as their "academic home". One option is to strengthen the position of the programme coordinators as link between the two types of entities.

The coordination of the programme as a whole is well handled by the Coordination Unit and ISP, but it is vulnerable due to the heavy dependence on a few individuals for actual decision-making. In the Coordination Unit, care should be taken to involve more core staff in decision-making processes.

While in the next programme phase the primary scientific goal will continue to be production of PhD/Master graduates and academic publication, more emphasis should be put on the importance and relevance of applied research and research dissemination to enhance UEM's position and role in Mozambique.

2. How can the programme be designed in order to encourage innovative processes with partners, in order to support new ideas of working and critical thinking?

Some of the many new universities established in Mozambique in the past decade are of high quality and have special areas of competence. There is an opening for accepting research applications from these universities in the new programme, and these should be combined with cooperation between the management units at UEM and the relevant external universities (including private ones) for new critical ideas. Lessons from Sida's other similar programmes indicate that PhD students from other universities risk discrimination, difficulties accessing resources, unmanageable bureaucratic hurdles, and exclusion from activities and possibilities. Programme monitoring should involve a channel for the external PhD students that does not go through UEM.

The relationships between UEM and external public, private, and civil society institutions currently take place primarily at the level of individual staff members. Some of those relationships, including private sector companies, should be treated at the institutional level to contribute with new ideas, including, for instance, teaching, public discussions, and the hosting of interns.

3. How can the research cooperation's contribution to viable and sustainable research environments be further improved?

The main immediate way to contribute to a viable and sustainable research environment is to enhance the emphasis on strategic planning, change management, and reform in the new programme – if relevant by bringing in external expertise on the management of universities. Opportunities for supporting early research careers should be created by improving access to post-doc research funds.

Due to a number of critical issues with UEM's financing, currently accentuated by the political and economic crises in Mozambique, external donor funding should be combined with efforts to re-establish a university consulting unit in order to diversify income sources. It is equally important to reduce costs, with the most obvious immediate action being to reduce or halt the excessive establishment of new departments, courses, and schools and rather focus on improving and strengthening the existing ones and discontinuing obsolete ones.

4. Can the establishment of local PhD training be enhanced if cross-cutting PhD courses are set up?

Self-assessments by UEM imply that there are three to five departments or disciplines that currently have the competence and capacity to run their own PhD programmes. Currently cross-cutting courses and research are primarily done between departments within the same faculties. While it is important to expand cross-cutting research and courses to bridge different faculties (such as medicine and anthropology, or engineering and economics), this requires that the prospective partners first consolidate their own competence and capacity. Experiences of cross-cutting courses in other UEM/Sida cooperation programmes are very positive: Cross-cutting courses on theory of science and methodology in Tanzania and similar courses in Uganda were found to be very cost-efficient and very useful (Kruse, Tedre, et al., 2014).

5. How could the system for quality control of the local postgraduate programmes be improved?

This evaluation found that good work was until recently done in the area of quality assurance and control at UEM through the establishment of a Quality Assurance Unit (funded by Italy). The effort was discontinued mainly for financial reasons. The work should be revitalized and expanded. Quality control should include programme management as well as teaching and supervision.

6. What actions can UEM take to actively support and promote more women to do research?

There are deep-rooted structural and cultural reasons for the relatively weak representation of women at UEM and in the programme, but there are also some examples of well qualified women in important positions to show that improvement is possible. Experience from institutional development in Mozambique shows that efforts at mainstreaming women's rights and gender equality have a tendency to fail

(Tvedten et al. 2015). While maintaining support to the UEM Gender Unit for overall advocacy, the best approach seems to be positive discrimination in recruitment, special follow up when necessary, and special efforts to disseminate results internally at UEM as well as externally to provide role models and "lead by example".

7. How can the Swedish and South African partner universities be better utilised/drawn upon in innovative and sustainable ways within the programme?

There is currently hardly any coordination between the Swedish and the South African partners of the programme. While the Swedish partner universities generally get good feedback on programme management and teaching, the South African universities are seen to be poor in management of the programme (with the students treated as any other foreign students without backing from a large programme), yet those universities deliver good courses and results. With improvements in programme management, there are good academic as a well as financial arguments for enhancing the role of South African universities also in the form of visiting scholars and lecturers.

8. How can Sweden and Mozambique cooperate in the improvement of supervision of PhD students?

The most immediate concern is to clarify the roles (rights and obligations) between the Swedish (main) supervisors and the Mozambican (co-) supervisors. This includes the issues of economic compensation, formal credit for supervision, and co-authorship. A clear mode of collaborative learning through co-supervision should be instituted, and active discussion and collaboration between supervisors should be encouraged. Mozambican supervisors should also have access to courses in student supervision when needed.

9. How can the link between research result uptake/innovations and public/private partnerships/private sector development be strengthened? Which role should Sweden play?

The key issue for UEM is to improve in areas that external stakeholders are least satisfied with: The ability to apply knowledge and be critical towards one's discipline, and to write accessible studies and reports. There are already substantial contacts between UEM and the private sector through the extensive practise of doing consultancies and the fact that a number of UEM staff own and run private businesses. Rather than trying to regulate the practice, a more realistic option may be

to accept it and develop such relations into an applied branch of the university. Sweden should team their efforts with Finland's sizable science, technology, and innovation programmes that have supported an interplay of government, businesses, and universities. For instance, Finland's STIFIMO programme supported Mozambique's STI sector with 22 million euros in 2010–2014 .[36]

10. How can UEM as a key research university in Mozambique play a role in strengthening the Mozambican higher education and research systems?

There are currently too many universities in Mozambique given the available pool of competent and qualified staff. Coordination efforts should also be made to avoid overlaps in the types of disciplines and courses given. Once that is done, an active exchange of staff – from giving individual presentations to running full courses and modules – should be intensified. This should include courses in scientific methodologies and writing. Sweden can encourage this by allocating funds for this purpose during the next programme period.

11. How can donor support to research at UEM be harmonized to ensure a better research environment at UEM, and avoid duplications?

The minimum expectation should be that the main donors to UEM (Sweden, Italy, and Belgium) meet at regular intervals to inform each other about and discuss the individual programmes to avoid overlaps, and learn from each other's successes and mistakes.[37] Those meetings must involve also players and programmes in adjacent sectors, or risk ignoring parallel funding to, for instance, Ministry of Education and Human Development or MCTESTP. The option of pooling funds for better coordination and more concerted efforts should also be looked into. The Coordination Office should have a central role in this, and a forum should be established for a more candid interaction between UEM on the one side and the donors on the other.

In addition to the responses above, mid-way in the upcoming project period (July 2017-2022), a special study should be commissioned to discuss the future long-term options for the programme, including the scenarios listed below and a possible exit strategy.

[36] Sweden has also supported Innovation Cluster programs through the former MCT and now through FNI. UEM had previously a coordination role which was moved to FNI.

[37] The statementis based on interviews with Italy and Belgium. The Swedish Embassy argues that donors do meet, but with an inadequte involvement of UEM.

Long-term scenarios. The following scenarios are meant as options for Sida and UEM to consider and refer to the five stages of development introduced in Section 6.2. Each scenario has its pros and cons. None are either right or wrong, but depend on how the current state of affairs is perceived and what the future objectives should be. The programme still suffers from internal and external inefficiencies, but the most critical and difficult question is to what extent there is a need and potential for change so that the same resources could be used more efficiently and effectively in the future. The following four scenarios are placed on a continuum from incremental reform to more fundamental change.

Scenario 1: Consolidation and evolution

Consolidate and improve components in the existing programme through a combination of sandwich training and organisational and infrastructural development – with adjustments in Swedish and South African university partners as well as UEM. A careful analysis of existing strengths and weaknesses would be required and a practical and specific plan for how to overcome the constraints would be needed[38]. Possible reforms and changes could involve:

(a) A longer period of time for students in Sweden, particularly in the early phase to secure a good start and in the final phase to support the final writing.
(b) A partial reorganisation of the cooperation with RSA, in order to ease the burden of practical challenges for students and establish relations between each university and UEM to better follow progress.
(c) Involve the co-supervisors at UEM more actively in the planning of programmes and projects to enable fuller use of their expertise, and at the same time prepare the ground for returning students through strategic and management reform. Secure an environment conducive to research so that UEM supervisors and graduates can devote themselves to research and UEM realise its potential as a research based university.

Scenario 2: Towards national capacity building

The second scenario is to make a more deliberate and systematic transition from Swedish/South African sandwich training to building research and research training capacity at UEM.

(a) Develop and consolidate existing Master and PhD training at UEM, and only subsequently develop new training programmes.

[38] It is beyond our mandate to assess the new proposal for 2017-2022, but it appears too general and not suffiently targeted to solve UEM´s current challenges.

(b) Mozambican students should not go to Sweden and South Africa for extended period of time, but for short courses or only when required for research.
(c) Teachers from Swedish and other external universities should be used for curriculum development, supporting crosscutting courses for students and supervisors, acting as co-supervisors and, peer-supported by Swedish and South African university managers, advising the university in strategic planning and management.
(d) Funds released by having "cheaper students" through shorter stays abroad should be used to invest in improved equipment and research environment at UEM. There is a move in this direction in UEM´s new proposal (July 2017-2022), where 32 PhD candidates (out of 210) will be directly enrolled in national PhD training, 96 will be trained under double or joint degree programmes and only 32 (20%) under the traditional sandwich model.

Scenario 3: Diversification

In the third scenario, Swedish support could in the future be used to strengthen the capacities in one or several other Mozambican universities through more direct and targeted support. Other universities in Mozambique have so far only benefited indirectly and probably marginally from Swedish support to UEM, but directly from support through the former MCT and now FNI. As a comparison, there would be public outrage if the Swedish government would decide that Lund University, for example, would get a massive annual injection of external support and leave the other universities with none. The new proposal (July 2017-2022) suggests the inclusion of 50 PhD candidates (out of the 210) from other universities, so the need for some level of diversification is acknowledged. This evaluation did not assess the extent to which it is feasible to increase the support further even though there are obvious candidates, such as the for instance the Pedagogical University, the Catholic University, UniZambeze and UniLurio and possibly also private universities such as Politécnica and Universidade São Tomás. Important lessons from Swedish support to other countries regarding diversification should be heeded before proceeding.

This scenario is justified by regional development outside the capital city in a context where political and economic concentration is highly contested. It may narrow the gap between UEM and other universities instead of widening it, by facilitating a more diverse and pluralistic university sector, by avoiding the trap of diminishing returns with a single recipient, by greatly increasing the currently dwindling pool of capable candidates, and by de-centralization and increased competition in the university sector. Such approach could also make it possible to be more selective in choosing candidates with the best academic record and highest potential.

Scenario 4: Encourage excellence through competition

The fourth scenario is based on the argument that time has come to move from research training to actual research. Training of researchers at UEM has been supported for nearly four decades, yet the majority of well trained researchers do not work as researchers, but as teachers. Hence, the best-qualified researchers in

Mozambique should be given opportunities to work as full time researchers. Competitive grants schemes would be the preferred mechanisms for financing research especially where resources are limited – provided that they are administered with transparency, are merit-based, rule-bound, and selected by independent international committees. UEM allocates small research grants on a competitive basis. The next step in this scenario should be to significantly strengthen the National Research Fund. The fund should issue calls for proposals on a broad and transparent basis, with qualified researchers from all Mozambican research institutions being eligible to apply. This would make it competitive, and only high quality proposals would be funded. The new proposal from UEM (July 2017-2022) includes 30 post-doctoral research projects, so there is an effort to support more research internally. Sweden has more recently decided to support the national research fund FNI (Dec 2016-2021, 42 500 000 SEK) to strenthen their role as a national research council. Their research funds will be available to all.

Annex 1 – Terms of Reference

Evaluation of Swedish government funded research cooperation support to Mozambique 2011-2016

1. Evaluation Purpose

The purpose of the evaluation is to analyse, assess, generate knowledge and provide lessons from the Swedish government funded research cooperation support to Mozambique. The evaluation results will inform the design of and improvement of performance of a possible continuation of such support to Mozambique 2017-2021. As such it will form an important basis for the future decision on support.

The point of departure is the overall objectives of the Strategy for research cooperation and research in development cooperation 2015-2021: *to strengthen research of high quality and of relevance to poverty reduction and sustainable development, with a focus on low-income countries*[39].

The evaluation shall specifically cover the bilateral research cooperation programme with Universidade Eduardo Mondlane (UEM), during the period 2011-2016.

The evaluation shall take its departure from a contextual analysis, including a general overview of change in research capacity and training, as well as the research environment that have occurred at UEM since the start of the Swedish support, 1978 (i.e. impact), and how the programme has contributed to change.

The evaluation shall describe and assess past progress, with focus on the future direction and management of the support (in Mozambique, Sweden and South Africa) resulting in concrete and realistic recommendations, regarding outputs (e.g. trained MSc's and PhD's etc.), and outcomes, (e.g. use of research capacity and of research results etc.), specifically:

(a) Assess to what extent the program has contributed to the expected outputs, outcomes and impact, and the sustainability of these results.

[39] Strategy for research cooperation and research in development cooperation 2015-2021. p 1.

(b) Assess the efficiency (including cost-effectiveness) of the program design, organizational set-up and cooperating partners in the delivery of expected outputs.
(c) Establish achievements and weaknesses and put forward recommendations for the possible future programming phase.

The evaluation process shall include participatory methods. The evaluation process, including methods and reporting, shall adhere to the OECD/DAC Evaluation Quality Standards. Key definitions used shall follow *DACs Glossary of Key Terms in Evaluation and Results Based Management.*

2. Background

The Swedish research cooperation with Mozambique was initiated in 1978 and will in 2017 enter into its tenth phase. The cooperation focuses on institutional research capacity building for research mainly at Universidade Eduardo Mondlane (UEM). Sweden has, over a period of 30 years, provided UEM an amount close to SEK 450 million. The current agreement period 2011-2015 (extended to 2016) amounts to SEK 248,5 million.

Well-trained researchers can pose and pursue questions relevant for poverty reduction, national development in many sectors of the society, and enhanced standard of living. The aim of the programme was to support the existing structures and encourage the development of new structures that would create an environment that is conducive for research training and in so doing assist to identify and improve upon structures that hinder university research. The programme was built around international research collaboration, principally with Swedish and South African universities. The aim of the Swedish research cooperation has been institutional support, aimed at building sustainable research capacity at UEM.

The main objective for research cooperation with Mozambique for 2011-2016 was to strengthen national research capacity so that Mozambique has the ability to better be able to plan, produce and use research in the fight against poverty[40].

The current agreement 2011-2016 which is to be evaluated entails support to 99 PhD students, 46 MA students, in 12 different UEM units. Institutional support has been provided to libraries, laboratories, the UEM Marine Biology Research Station at Inhaca Island and the establishment of four MSc programmes. The support has been

[40] Assessment Memorandum, Zinaida Iritz, João Jussar. 7 June 2011: Continued Bilateral Research Cooperation with Eduardo Mondlane University 1 March 2011 to 31 December 2015.

directed to support an environment that is conducive for research and research training. Support has also been provided to university postgraduate, facility and research funds, research management and coordination.

3. Stakeholder involvement and intended users

UEM, Directorate of Cooperation has provided comments to the Terms of Reference of this evaluation. International Science Programme, Uppsala University as the Swedish coordinating institution has also commented on the ToR.

The direct intended users of this evaluation are UEM incl. UEM management, researchers and PhD and MSc students, Embassy of Sweden in Maputo, the Sida Research unit and International Science Programme, Uppsala University. In addition, this evaluation will be important for all collaborating partners in the ongoing and future research collaboration with Mozambique (from Mozambique, Sweden and South Africa), as well as other development cooperation partners and national stakeholders in the area of research and higher education and finally the Ministry for Science, Technology, Higher Education and Technical and Professional Training.

4. Specific evaluation questions to respond:

Relevance

1. Has the research cooperation programme been consistent with UEM's development priorities, needs and institutional capacity?
2. Does the university have relevant policy/strategy documents that guide the development of research and research capacity building in a long-term perspective?
3. Has the research cooperation program effectively and sustainably supported strengthening of the research environment at UEM?
4. What impact has the programmes had on research management capacity? Assess the quality, efficiency, effectiveness of the research management (including of funds) during the evaluation period.
5. How has a human rights based approach (HRBA) i.e. non-discrimination, participation, accountability and transparency, been taken into account in the implementation of the program? Are there specific aspects of HRBA that should be especially considered and how can improvements be made?
6. Does the university have clear policies/action plans to change gender imbalances and increase the number of female researchers? Describe any specific actions taken.
7. Are there any efforts by the university to promote the use of research in society with respect to communication of research and research results, extension services, dialogue with stakeholders, protection of national knowledge production through patents, intellectual property rights etc.?
8. Does the university have any coherent regulation on the ownership, management and exploitation of intellectual property?

9. Have the research projects supported in the programme been relevant to the current development goals of Mozambique[41], especially related to poverty reduction and inclusive growth?
10. To what extent is poverty, in its different dimensions, addressed in the design, implementation and follow up of the intervention? What/which dimensions are addressed? How could the intervention be strengthened so that poverty reduction is more explicitly addressed?

Scientific Results and Quality

11. What are the main scientific results in the supported thematic sub-programmes? Are there any special outstanding or acknowledged results? Describe them.
12. What is the quantity and scientific quality of the research conducted at UEM in terms of academic publications in international/national scientific journals and presentations at international conferences?
13. Produce an overview, based on available UEM data, of the number of academic publications produced within the Swedish research program published in international and national scientific journals during the evaluation period 2011-2016.
14. What role have the UEM research fund grants played to encourage research at UEM and what outcome have they contributed to in terms of scientific outputs?
15. Outline and evaluate the review process of research proposals at university level used for university wide funds.
16. Has the capacity at UEM to attract national and external research funds increased? In the country in total?
17. Has the number of national MSc and PhD programmes increased at UEM? How many students have been trained locally with Swedish support?
18. Are the current UEM quality assurance mechanisms and guidelines/regulations effectively used in practice? Does the local MSc and PhD supervision follow UEM quality assurance regulations?
19. What is the assessed scientific quality of UEM's MSc and PhD programmes with regard to local course work (including generic cross-cutting PhD courses)?
20. Specifically assess the scientific quality of the four MSc programmes supported by Sweden and the graduation rates of those programmes.
21. Assess quality and effectiveness of any crosscutting PhD courses offered by UEM.
22. Outline to what extent the research cooperation has impacted on academic quality and research culture in the context of MSc and PhD training and supervision at UEM.

[41] Programa Quinquenal do Governo 2015-2019

23. Evaluate the possibility of introducing potential 'Double Degrees'[42] in the programme. What would be the added value for UEM and for the Swedish institutions to graduate students with double degrees? What would be the challenges?

Efficiency

24. Describe to what extent donor coordination has been implemented/improved at UEM, and if funding partners' complementarity and/or programme overlap has been considered by UEM (being a basis for strategic planning/decision-making).
25. In the context of research cooperation, assess the added value and comparative strengths of Sweden as a partner to UEM, as compared to other international funding partners.
26. What is the average time needed for completion of MSc[43] and PhD studies within the programme (at UEM, in Sweden and in South Africa)? What are reasons for having difficulties to finalise MSc and PhD studies or for leaving the programme? Do some sub-programs have more difficulties with this than others? Is there any gender or age differences?
27. How does the university select and follow up the PhD and MSc students' performance? Are there any formal regulations and procedures and are they well known and publically accessible?
28. How can research management at UEM become more efficient in terms of a) bureaucracy b) managerial capacity c) donor harmonization and alignment?
29. Can current administrative regulations of UEM and practices provide a platform for management efficiency (e.g. in the area of procurement)?

Effectiveness

30. Outline how the programme has contributed to research facilities (laboratories, the MBRS, ICT infrastructure, library services etc.).
31. Assess the utilization, management, and the potential financial sustainability of the MBRS and the LINAC Bunker.
32. Assess the Swedish, Mozambican and South African PhD supervision within the programme, including communication between supervisors at UEM and in Sweden or South Africa, and between supervisors and students. Has any change to regulations in relation to supervision been institutionalized beyond the programme?

[42] A student receiving a PhD degree from both UEM and a Swedish university.

[43] MSc Program in Chemistry and Processing of Local Resources, MSc Program in Science in Food Technology, MSc Program in Mineral Resources Management, MSc Program in Sciences in Wood Technology

33. Assess the efficiency of the management and the coordination of the programme (including funds) by the Management Team. Assess the effectiveness and value of other management structures at UEM for the program (e.g. sub-program coordination). Suggest possible improvements.
34. Assess the Directorate of Cooperation efficiency in coordinating the Swedish research programme during the period 2011-2016, such as: effectiveness of decision- making (implementation pace/systematic follow up/documentation) related to Agreement/Agreed Minutes/Management Responses/Action Plans; management transparency and accountability; incorporation of experiences (success/failures) from previous phases of the programme (incl. management routines).
35. Evaluate the reporting mechanisms within the program, i.e. the Annual Progress Reports, the Annual Plans and the Results Based Management (RBM) framework. Assess the extent to which the RBM framework is in use and the understanding of the RBM tool on unit level by UEM staff. How can the use of the RBM tool be strengthened?
36. Evaluate the work of the Directorate of Cooperation in following up implementations of the programme. Particularly compare annual activity plans and budgets with annual narrative and financial progress reports. Have any discrepancies between these documents been monitored, and documented, including financial consequences? Assess any follow-up to such discrepancies, if any.
37. Evaluate how the UEM faculties and units that are part of the programme perceive the work of the Directorate of Cooperation and Management Team with regard to the management of the programme.
38. How do researchers and student perceive the research management?
39. Assess the effectiveness and value of the management of the program in Sweden by International Science Program, Uppsala University.
40. Assess the Standard Operating procedures of the programme, and suggest improvements.

Impact

41. Assess to what extent the programme has contributed to improved research capacity at UEM and in Mozambique. Has a critical mass of competent researchers in targeted research areas been created over the years of Swedish support (since 1978)? In which specific fields? To what extent?
42. How has the programme increased capacity to formulate research problems and proposals? Describe the role and impact of the UEM research fund, and propose future possible changes.
43. Describe any changes in university strategies and priorities for research and research training and ways in which the Swedish supported research cooperation may have contributed to strategic long-term transformation and change.
44. Assess the collaboration UEM-Swedish and UEM-RSA partner universities based on communication/ scientific partnership/mutual project ownership. Suggest possible improvements.

45. What impact has the research programme had on the Swedish partner universities?
46. Could the Swedish and/or South African partner universities play additional roles within the programme or collaborate in a different way?
47. Have support been given in a way that has enhanced innovative processes and innovative thinking within UEM, the partner universities and stakeholders? Are there proofs of innovative ideas or ways of working that have emerged during this programme? Has research been conducted with potential for innovation or that has led to innovation (defined in a broad sense as products, procedures and services)?
48. Describe UEM developments with regard to produced scientific innovations and links to private sector development and private-public partnerships.
49. In which way has the research programme had an impact on policy development, collaboration with ministries, industry and civil society? Give examples.

Sustainability

50. Assess the sustainability of research and research training at UEM when the research cooperation programme supported by Sweden ends. What is the current planning for sustainability in research capacity building when support is phased out?
51. To what extent have regional (Africa) and international long-term research collaborations been established? Have Mozambican, South African and/or Swedish researchers within the programme benefited from them?
52. In what areas does UEM have all preconditions, e.g. critical mass of supervisors, courses, infrastructure and management capacity to shift from the sandwich model to in-house postgraduate training?
53. Are there any problems in relation to retention of researchers? If so, what are the reasons? Are there any specific efforts made by the universities to retain researchers?
54. What are the career opportunities for researchers at UEM? Is career advancement based on publications and/or supervision of MSc and PhD students? What incentives are there for carrying out research? Is it possible for academic staff to get reduction of teaching/administrative load to carry out research? Is it possible to take sabbaticals to carry out research? Are staffs that attract external funding premiered?
55. What are the main bottlenecks for development of research capacity within UEM, such as ICT, salary issues, career paths for researchers, procurement etc.?
56. Does UEM have sufficient institutional capacity and mechanisms to maintain and sustain the built research infrastructure capacity?

5. Recommendations and lesson learnt for the future

The evaluation shall provide the Embassy of Sweden and UEM with recommendations, in the short and the long-term. The recommendations given shall be based on an in-depth analysis of the entire evaluation, be unambiguous and possible to act upon. The recommendations shall address (not exclusively) the following questions:

- What is the impact of Swedish support to research at UEM since year 1978, with focus on the evaluation period?
- How can the present research cooperation with Mozambique be improved and made more efficient with regard to overall goals, financial/research management, programme coordination, and scientific goals?
- How can the programme be designed in order to encourage innovative processes with partners, in order to support new ideas of working and critical thinking?
- What actions can UEM take to actively support and promote more women to do research?
- How could the system for quality control of the local postgraduate programmes be improved?
- Can the establishment of local PhD training be enhanced if cross-cutting PhD courses are set up?
- How can the research cooperation's contribution to viable and sustainable research environments be further improved?
- How can the overall coordination of the programme at UEM be improved, and timely implementation of the programme be ensured?
- How can the Swedish and South African partner universities be better utilised/drawn upon in innovative and sustainable ways within the programme?
- How can Sweden and Mozambique cooperate in the improvement of supervision of PhD students?
- How can the link between research result uptake/innovations and public/private partnerships/private sector development be strengthened? Which role should Sweden play?
- How can UEM as a key research university in Mozambique play a role in strengthening the Mozambican higher education and research systems?
- How can donor support to research at UEM be harmonized to ensure a better research environment at UEM, and avoid duplications?
- What risks does the Evaluation Team foresee in the research cooperation and how can these be mitigated?

6. Methodology

The evaluation process is seen as a process of learning and improvement and thus participatory evaluation methods are perceived critical. This implies that representative samples of stakeholders (such as coordinators; supervisors; researchers; MSc and PhD students; other staff; the Management Team) should be consulted. The evaluators should describe the groups (gender disaggregated data) that have been consulted and why they were selected.

The evaluators shall propose an evaluation methodology, including particular evaluation techniques in the proposal, and elaborate them further in an inception report. The inception report should include a specified time and work plan with delivery dates for the reports, field visits and dissemination activities. The inception report will form the basis for the continued evaluation process and methods to be used.

The methodology to be used must be identified and elaborated by the evaluators, but will include:

- Document review and analysis
- Semi-structured interviews using interview instruments, with individuals and groups, both in Mozambique, Sweden and South Africa if deemed relevant
- Focus group interviews
- Surveys
- Telephone communication and e-mails

The methodology used shall be described and annexed to the final report. All conclusions should be supported by data, and if not, it should be stated that the conclusions are based on the opinions of the authors.

7. Timeframe and budget

Activity	Period/ Point in time	Whom
Contacting of evaluation team/content analysis of documents	-19/8 2016	Embassy and Evaluation team
Inception report presented to the Embassy and UEM	15/9 2016	Evaluation team
Approval of Inception Report		Embassy
Field work Sweden/Mozambique		Evaluation team
Draft evaluation report to be presented to Embassy and UEM	Approx. 30/11 2016	Evaluation team
Comments to Evaluation team		Embassy
Revised evaluation report to be submitted to Embassy		Evaluation team
Possible comments to Evaluation team		Embassy
Final evaluation report submitted to the Embassy	15/1 2017	Evaluation team

The assignment will be initiated in August, 2016 and completed no later than January, 2017 (see milestones in table above). The study shall be conducted and results made available in a timely manner. Un-envisaged changes to timeframe and budget must be explained in the final report. Any discrepancies between the planned and actual implementation of the study must be explained. The maximum budget available for the assignment is 1 500 000 SEK.

8. Reporting

The following outputs shall be delivered by the evaluators:

- Written inception report
- Draft written evaluation report
- Revised written evaluation report
- Final written evaluation report

The draft evaluation report should be submitted electronically to the Embassy of Sweden, Maputo, and to Universidade Eduardo Mondlane, Directorate of Cooperation, no later than 30 November, 2016. A presentation must be held where the draft report is presented and discussed with participation from collaborating partners.

The final reports shall be submitted to the Embassy of Sweden, Maputo, no later than 15 January 2017, in electronic form in Microsoft Word for Windows and should be presented in a way that enables publication without further editing.

Reporting requirements:

- The report shall be in English and not exceed 50 pages, excluding annexes.
- The reporting shall adhere to the evaluation terminology of the *OECD/DAC Glossary on Evaluation and Results-Based Management* as far as possible.
- The evaluation report should consider the report format presented in Annex B of Sida's evaluation manual *Looking Back Moving Forward*, 2nd revised edition, 2007.
- The reports will be assessed against standard quality criteria for evaluation reporting, such as the DAC Evaluation Quality Standards of 2006.
- The reports shall contain a list of persons interviewed during the evaluation, detailing their names, gender, positions and affiliations.
- The recommendations given shall be based on an in-depth analysis of the entire evaluation, be unambiguous and possible to act upon.
- The report shall contain an Executive Summary which shall provide an overview of the report highlighting the main conclusions and recommendations.
- The report shall answer all the issues addressed in the Terms of Reference. If this is not possible, reasons and explanations shall be provided.
- The evaluators shall, upon approval of the final report, insert the report into the Sida template for decentralised evaluations and submit it to Sida's consultant responsible for Sida's graphic profile (currently Sitrus), for publication and release in the Sida publication data base.

Subject to the Embassy of Sweden, Maputo, and Sida decisions, the report may be published and distributed within the Sida Evaluation series.

9. Quality Control

A reference group will be attached to this evaluation to review draft reports and provide comments for improvement. The reference group will consist of representatives from Embassy of Sweden, Sida Research Unit, UEM and a Swedish collaborating institution.

The evaluators shall specify how quality assurance will be handled by them during the evaluation process.

10. Evaluation team

Team Leader:

- PhD in relevant area with a minimum of 10 years' experience of carrying out research, with up-to-date record of publications
- Knowledge of sustainable research capacity building
- Broad knowledge of higher education and research (HE&R) management/institution building

- Knowledge academic contexts and circumstances in Sub-Saharan Africa
- Team members:
- At least 2 team members must have PhDs (incl. Team leader) and knowledge of conditions for scientific research
- Additional team members must have a minimum of Masters' degree
- Knowledge of sustainable research capacity building
- Broad knowledge of HE&R management/institutions
- Knowledge of gender policy and gender mainstreaming issues
- Knowledge of universities in low income countries
- Knowledge of Mozambique, and the Sub-Saharan region.

All members:

- Fluency in spoken and written English and/or Portuguese.

11. Appendices

- Appraisal documents, plans and reports will be provided by the Embassy of Sweden.
- Sida's Template for Evaluation Reports.

Annex 2 – References

Sida and Swedish Embassy
Assessment of applications for research programmes
Budget 2011-2015, Eduardo Mondlane University
Budget of the UEM-Sida Program for the Period Agreement 2011-2015
Continued bilateral research cooperation with Eduardo Mondlane University, UEM, Mozambique
Decision 2011-2102
Meeting Notes on Research Secretariat Committee meeting regarding Assessment of Continued Research Memo.
National Public Financial Management PFM
Result Assessment Framework (RAF), Eduardo Mondlane University
Risk Assessment and Matrix, Eduardo Mondlane University
Continued Bilateral Research Cooperation with Eduardo Mondlane University, UEM, Mozambique. 1 March 2011 to 31 December 2015
Specific Agreement between Sweden and the Government of Mozambique on Continued Research Cooperation with UEM 2011-2015
Standard Operating Procedures for research capacity strengthening at UEM
Strategi for Sveriges utvecklingssamarbete med Mozambique
Strategy for research cooperation and research in development cooperation 2015-2021
Guidelines Edition 2008, Support to national research development.

ISP
Tracing-isp-graduates-2008-2013-final
Agreement ISP addendum 2 Dec 2013
COORDINATION BUDGET ISP 2014-2015
ISP activity report 2014
ISP Activity report 2015

UEM
Activity Plan 2013 Final
Activity Plan 2015_UEM Sweden_150512
Activity Plan for year 2015 – Research Cooperation Programme Between UEM and Sweden. Maputo: UEM/ Cooperation Office.
Activity Plan UEM-Asdi 2014_Revised
Activity Plan UEM-Sweden 2016
Agreement UEM
Amendment III Agreement on research cooperation 2011-2016

Budget Collaborating Institutions 2014
Collaborating institution and coordination 2015_150512
Concept Note for the UEM-Sida Bilateral Research Programme (2015)
Decision UEM Amendment 6 Nov 2015
Deloitte Management letter for 2014
Consolidated Financial Report 2013
Consolidated Financial Report 2015
Financial Statement 2014 and the related Management Letter
KPMG. Financial Audit Report 2013
Normas do Fundo de Aquisição e Manutenção de Equipamentos 2013
Orações de Sapiência 2013-2016. 2016
Procurement Management Plan. 2015
Primeiro Plano Estratégico da UEM. Strategic Objective 8: Gender Equity
National PFM systems and the implications for the UEM support.
INFORME DO REITOR 2015
Mid term review 2014
Regulamento de Financiamento de Participação em Eventos Científicos 2013
Research Programme Appendix Prog 1-18 Draft submitted 2 August 2014
Swedish Continued Research Cooperation with Eduardo Mondlane University.
Evaluation Committee Report. Mid-term evaluation held during June 9-20 2014.
Maputo: UEM/Cooperation Office.
UEM Budget 2013
UEM Budget 2016
UEM Budget for the year 2014
UEM Procurement Management Plan 2015
UEM Progress Report 2013
UEM Progress Report 2014
UEM Progress Report 2012

UEM draft Progress Report 2015?
Vol I UEM Self-Assessment
Volume II Self Assessment
Publication Policy at Eduardo Mondlane University 2015
Research Lines at Eduardo Mondlane University 2016
Full proposal for the UEM-Sida bilateral research programme 2017-2021(2016)

Agreed Minutes
Agreed Minutes Annual Planning Meeting 2014
Agreed Minutes 2015
Agreed Minutes 2012
Agreed Minutes UEM 2016
Agreed Minutes UEM Annual Planning meeting 6-7 Oct 2015
Agreed Minutes UEM Annual Review meeting 2014
Agreed Minutes UEM_Sida ISP 25.11.2011

General

Alberts, Tom et al. (2003). Sida's Support to the University Eduardo Mondlane, Mozambique. Sida Evaluation 03/35. Stockholm: Sida
Boeren, Ad et. al. (2006). Sida/SAREC Bilateral Research Cooperation: Lessons Learned. Sida Evaluation 06/17.
Fellesson, Måns and P. Mählck (2013). Academics on the Move. Mobility and Institutional Change in the Swedish Development Support to Research Capacity Building in Mozambique. Uppsala: Nordiska Afrikainstitutet.
FNI (2014), Promovendo a Pesquisa Rumo Au Desenvolvimento Sustantavel.
FNI (2015), Manual de Normas e Procidemtos Para Financiamento de Projectos.
FNI (2016), Evaluation of the Socio-economic impact of the projects funded by the FNI 2006-13. Africa Capacity Report (2016). The African Capacity Building Foundation (ACBF)
Higher Education in Sweden 2016 Status report. Sweden Higher Education Authority.
Hydén, Göran (2006). University and Faculty Research Funds at Universities in Mozambique, Tanzania and Uganda. Sida Evaluation 06/23. Stockholm: Sida
IESE Development Strategy 2012-15
Knight, Jane (2011). "Doubts and Dilemmas with Double Degree Programs". In: "Globalisation and Internationalisation of Higher Education". Revista de Universidad y Sociedad del Conocimiento (RUSC). Vol. 8, No 2, pp. 297-312.
Kruse, Stein-Erik et. al. (2014). Evaluation of the Swedish Government Funded Research Cooperation Support to Uganda 2010-2014, Sida Sweden.
Kruse, Stein-Erik, Tedre, Matti et. al. (2014). Evaluation of the Swedish Research Cooperation with Tanzania 2009-2013. Sida.
Kruse, Stein-Erik; Tedre, Matti; Kayobyo, Godfrey (2014) (Evaluation Report) Evaluation of the Swedish Government Funded Research Cooperation Support to Uganda: Final Report. Sida Decentralized Evaluation 2014:39.
Kruse, Stein-Erik (2016). Exploring donorships. EBA Stockholm.
Langa, Patricio V. and Nelson C. Zavale (2015). "Private Higher Education in Mozambique: An Overview of a Growing Sub-System". In: *Working Papers on Higher Education Studies, 1 (2), 89-109.*
RdM (2015). Programa Quinquenal do Governo 2015-2019. Maputo: República de Moçambique.
Sall, Ebrima et al. (2004). Social Sciences on Mozambique, Tanzania, Uganda and Zimbabe. Sida.
Tvedten, Inge and A. Orre (2016). Country Evaluation Brief Mozambique. Evaluation Department Report 8/2016. Oslo: Norad.
Tvedten et al. (2015). "Evaluation of Norway's support to women's rights and gender equality in development cooperation. Mozambique Case Study Report". Norad. Evaluation Department. Report 2/2015.
Wield, David et al. (1998). Swedish Support to University of Eduardo Mondlane in Mozambique. Sida Evaluation 98/38. Stockholm: Sida
UNICEF (2014). Mozambique Annual Report

World Bank (2015). Project Paper for the Higher Education Science and Technology Project.
Xia, J., Harmon, J. L., Connolly, K. G., Donnelly, R. M., Anderson, M. R. and Howard, H. A. (2015), Who publishes in “predatory” journals? Journal of the Association for Information Science and Technology, 66(7), 1406–1417.

Annex 3 – People Met

Sweden
Akuffo, Hannah, Sida Research unit
Fellesson, Måns, Ministry of Foreign Affairs
Abrahamsson, Leif, ISP, Uppsala University
Rantakokko, Therese, ISP, Uppsala University
6 Swedish supervisors and 9 students attached to universities in Stockholm, Örebro, Luleå, Mälardalen, Uppsala and Royal Institute of Technology (KTH)

Mozambique
Antoon, Delie, Head of Development Cooperation Belgium
Barreto, Yara, Head of Engineering, Environment and Water Department, COWI
Cirillo, Tiziano, Higher and Technical Education Coordinator, Italian Development Cooperation
Cossa, Eugenia Rossa Flora, National Higher Education Director, Ministry of Science and Technology
Couto, Mia, Managing Director IMPACTO
De Jesus, Vitoria, Executive Director, National Research Foundation (FNI)
de Carvalho Eriksson, Cristina, Embassy of Sweden
Forquilha, Salvador, Director IESE
Ilskog, Elisabeth, Embassy of Sweden
Jesus, Vitoria, FNI Director
Menezes, Anna, The World Bank, Mozambique
Monteiro, Helena, National Higher Education Directorate
Nhamaze, Hélder, KULA

UEM
Afonso, Sónia, Programme coordinator Public Health and Animal Production
Albino, Mario Luis, Director of Finance
Cabinda, Manuel, Chief of Staff
Capece, Bettencourt, Scientific Director
Egas, Andrade, Master of Sciences in Wood Technology
Faife Tembe, Dionisia, Dulce, Director Internal Audit
Famba, Sebastião, Programme coordinator Land use and Agricultural Technologies
Francisco, José da Cruz, Programme coordinator Technology Processing of Natural
Guissamulo, Almeida, Programme coordinator Marine Science Programme
José, Generosa, UEM Gender Unit
Lucas, Carlos, Director Cooperation Office

Madiquida, Hilário, Programme coordinator Archeo-Anthropological and Historical Research
Madivate, Carvalho, MSc Program in Chemistry and Processing of Local Resources
Malipa, Orton, UEM Program Finance officer
Manjate, Elise, MA/PhD student Maternal and Child Health in HIV/AIDS
Maphossa, Alexandre, Programme coordinator of Biological Sciences Medical Radiation Physics
Matsinhe, Nelsom, Programme coordinator Integrated Water Resources Management
Mavume, Alberto, Programme coordinator Environment and Climate
Mondjana, Ana Maria, UEM Vice Rector Academic Affairs
Mondlane, Salvador, Master Program Coordinators
Munembe, João, Programme coordinator in Mathematics, Statistics & Informatics
Mutumucuio, Inocente, Programme coordinator Development of Research Culture and Capacity in Education
Nhumaio, Geraldo, Programme coordinator Aspects of IWRM for Sustainable
Pota, Pedro, UEM Procurement unit
Quilambo, Orlando, Rector
Santos, Luisa, UEM Q&A unit
Sevene, Esperança, Programme coordinator Maternal and Child Health in HIV/AIDS
Zimba, Horacio Francisco, Director Library Services

Researchers and Students interviewed in Focus Groups (excludes individual interviews)
Auziane, Gabriel, Technology Processing of Natural Resources
Baquete, Aguiar, Education
Chambal, Borges, Technology Processing of Natural Resources
Chemane, Lúcia, Technology Processing of Natural Resources
Chiau, Eulália, Technology Processing of Natural Resources
Eduarda, Maria, Energy Science and Technology Research Program
Fafetine, José, Impact of Zoonotic Diseases on Public Health and Animal Production
Fringe, Jorge, Education
Guambe, Calisto, A global Research Programme in Mathematics, Statistics and Informatics
Guambe, Ribas, A global Research Programme in Mathematics, Statistics and Informatics
Guiamba, Isabel, Technology Processing of Natural Resources
Machado, Adelina, Impact of Zoonotic Diseases on Public Health and Animal Production
Macuamule, Custódia, Technology Processing of Natural Resources
Magaia, Telma, Technology Processing of Natural Resources
Malipa, Ana, Impact of Zoonotic Diseases on Public Health and Animal Production
Manhique, Arão, Master supervisor in Chemistry and Local Resources Processing
Matusse, Americo, A global Research Programme in Mathematics, Statistics and Informatics

Miambo, Regina, Impact of Zoonotic Diseases on Public Health and Animal Production
Muiambo, Herminio, Technology Processing of Natural Resources
Oxboiana, Belisário Tomé, Impact of Zoonotic Diseases on Public Health and Animal Production
Pagula, Felisberto, Master supervisor in Chemistry and Local Resources Processing
Rodrigues, Marcelino, Technology Processing of Natural Resources
Saize, Stefan, A global Research Programme in Mathematics, Statistics and Informatics
Sicuaio, Tome, A global Research Programme in Mathematics, Statistics and Informatics
Tivana, Lucas, Technology Processing of Natural Resources
Zacarias, Orlando, A global Research Programme in Mathematics, Statistics and Informatics

Annex 4 – Basic Financial Data and Information

The following two tables are based on figures obtained during the evaluation and have not been updated with expenditures for October and December 2016. Aggregate figures are updated and available in Table 3.

	Total budget	UEM budget	Expenditure	Unutilised	% unutilised
	2011-16	**2011-16**	**2011- Oct 16**		
Research programmes (1-13)	17,6				
1. Land use and agric technologies	14 000	8,333	8,661	(-)0.328	(-) 4 %
2. Impact of Zoonotic Diseases	13 855 536	9,308	5,212	4,096	44 %
3. Techn processing	17 123 901	7,789	9,292	(-) 1.504	(-) 19%
4. Integrated water resources mgt	7 062 455	2,802	4,21	(-) 1.407	(-) 50%
5. Energy	12 891 045	7,317	8,265	(-) 0.948	(-) 13
6. Global research programme math	15 032 864	6,168	10,303	(-) 4.135	(-)67%
7. Development of research culture	4 924 701	2,227	2,658	(-) 0.431	(-) 19%
8. Strengthening biological and	6 428 990	4,429	4,03	0,399	9 %
9. Medical radiation physics	6 808 049	3,383	3,962	(-) 0.579	(-) 17%
10. Maternal and child health	12 306 804	4,607	2,246	2,361	51 %
11. Archo/antrophological	4 553 452	2,441	2,195	0,246	10 %
12. Environment and climate	3 138 736	1,379	2,041	(-) 0.662	(-) 48%
13. Consolidation of access and use	7 000 000	7	6,866	0,134	2 %
Sub total	125 126 531	67,183	69,941		
14. Postgraduate training fund	12 026 023	12,026	7,204	4,821	40 %
15. Scientific research fund	5 620 818	5,62	5,488	0,133	2 %
Sub total central research funds	17 646 841	17,646	12,692		
16. Research management	29 667 276	11,409	10,07	1,339	12 %
17. Training of research management	7 059 352	4,884	0,0064	4,82	98 %
18. UEM facility fund	4000 000	17	15,437	1,563	92 %
19. ISP	10 000 000				
Sub total research management	52 226 628	33,293	25,5134		
20. Master programme Chemistry	8,468	8,468	7,205	1,264	15 %
21. Master programme Food Technology	3,735	3,735	2,219	1,515	40 %
22. MSc Mineral Resources	8,281	8,281	6,51	1,771	21 %
23. MSc Wood Technology	7,41	7,41	3,554	3,856	52 %
Sub total Master programmes		27,894	19,488		
24. Inhaca	10,95		8,862	2,088	19 %
GRAND TOTAL	248,500	161,145	145,771	15,375	9.5%
Total to Mozambique		64 %			
Total to Sweden		36 %			

	Total budget	UEM budget	Expenditure	Unutilised	% unutilised
	2011-16	2011-16	2011- Oct 16	Oct. 2016	Oct.2016
Research programmes					
1. Land use and agric Technologies	14.000	8.333	8.661	(-)0.328	(-) 4 %
2. Impact of Zoonotic Diseases	13. 855	9.308	5.212	4.096	44 %
3. Techn processing	17.123	7.789	9.292	(-) 1.504	(-) 19%
4. Integrated water resources mgt	7.062	2.802	4.210	(-) 1.407	(-) 50%
5. Energy	12.891	7.317	8.265	(-) 0.948	(-) 13
6. Global research programme math	15. 032	6.168	10.303	(-) 4.135	(-)67%
7. Development of research culture	4.924	2.227	2.658	(-) 0.431	(-) 19%
8. Strengthening biological and	6.428	4.429	4.030	0.399	9 %
9. Medical radiation physics	6.808	3.383	3.962	(-) 0.579	(-) 17%
10. Maternal and child health	12.306	4.607	2.246	2.361	51 %
11. Archo/antropoological	4.553	2.441	2.195	0.246	10 %
12. Environment and climate	3.138	1.379	2.041	(-) 0.662	(-) 48%
13. Consolidation of access and use	7.000	7.000	6.866	0.134	2 %
Sub total	125. 261				
14. Postgraduate training fund	12.026	12.026	7.204	4.821	40 %
15. Scientific research fund	5.620	5.620	5.488	0.133	2 %
Sub total central research funds	17.646				
16. Research management	29.667	11.409	10.070	1.339	12 %
17. Training of research management	7.059	4.884	0.0064	4.820	98 %
18. UEM facility fund	4.000	17.000	15.437	1.563	92 %
19. ISP	10.000				
Sub total research management	52.226				
20. Master programme Chemistry	8.468	8.468	7.205	1.264	15 %
21. Master programme Food Techn	3.735	3.735	2.219	1.515	40 %
22. MSc Mineral Resources	8.281	8.281	6.510	1.771	21 %
23. MSc Wood Techn	7.410	7.410	3.554	3.856	52 %
Sub total Master programmes					
24. Inhaca	10.950		8.862	2.088	19 %
GRAND TOTAL	248.500	161.145	145.771	15.375	9.5%
Total to Mozambique		64 %			
Total to Sweden		36 %			

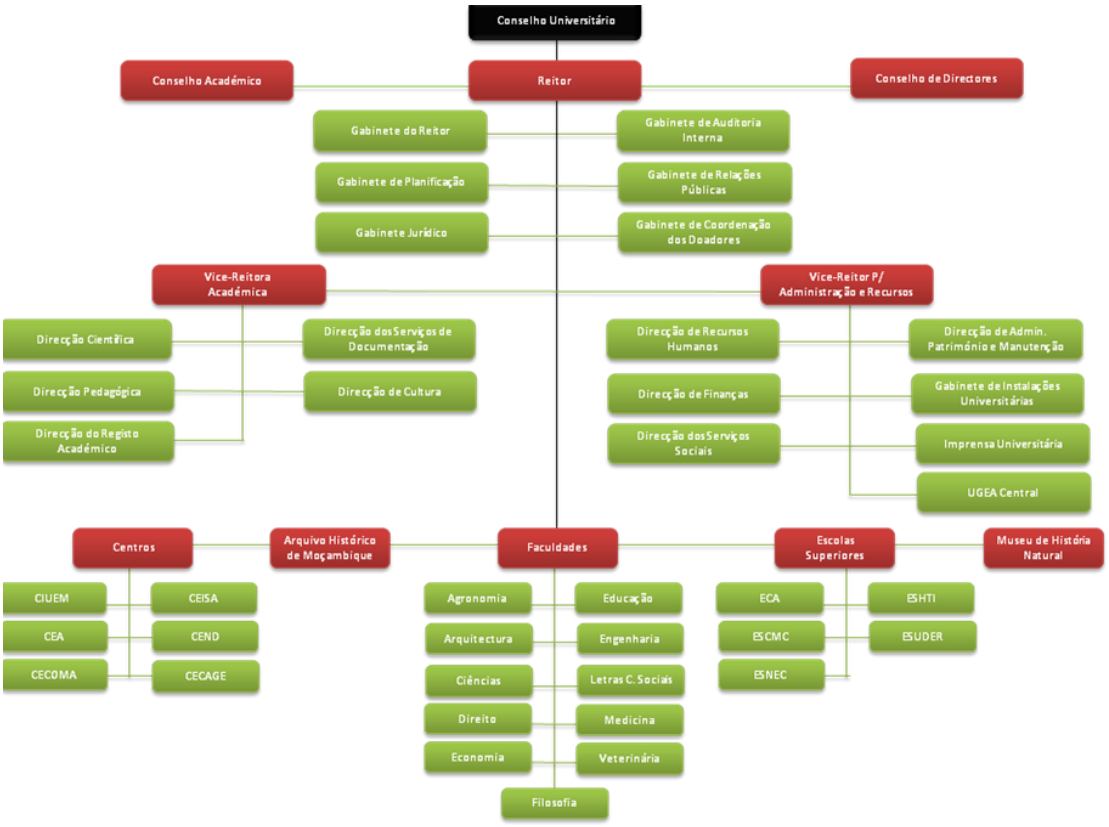
Annex 5 – Sida Supported Programmes

#	Title of Programme	Area	Hosting Unit
1	Land use and Agricultural Technologies for Poverty Reduction and Sustainable Development	Agriculture	Agronomy and Forestry Engineering
2	Impact of Zoonotic Diseases on Public Health and Animal Production in Mozambique	Health	Veterinary
3	Technology Processing of Natural Resources	Processing and Industry	Engineering
4	Integrated Water Resources Management – Quantitative and Qualitative Aspects of IWRM for Sustainable Development is Southern Mozambique	Water	Engineering/Sciences
5	Energy Science and Technology	Energy	Sciences
6	A Global Research Program in Mathematics, Statistics & Informatics	Education	Sciences
7	Development of Research Culture and Capacity in Education		Education
8	Strengthening of Biological and Oceanographic Research Capacity at the Department of Biological Sciences		Sciences
9	Medical Radiation Physics	Health	Sciences
10	Maternal and Child Health in HIV/AIDS High Endemic Area – Mozambique 2011-2015	HIV/AIDS	Medicine
11	Anthropological and Historical Research in Mozambique: From Middle Pleistocene to the Contemporary		Arts and Social Sciences
12	Environment and Climate Research Program	Environment & Climate	Sciences
13	Consolidation of Access and Use of Scientific Information Sources in Mozambique	Documentation	Central Library
14	Postgraduate Training Fund	Training in different areas	Scientific Directorate
15	Scientific research Fund	Research in different areas	Scientific Directorate
16	UEM Research Management Fund	Research management	Cooperation Office
17	Training of Research management staff	Training in research management	Cooperation Office
18	UEM Facility Fund	Research equipment	Scientific Directorate
19	UEM Coordination Fund	Coordination within UEM/Sida cooperation programme	Scientific Directorate
20	MSc Program in Chemistry and Processing of Local Resources	Coordination of MSc program	Faculty of Sciences
21	MSc Program in Food Technology	Coordination of MSc program	Faculty of Engineering
22	MSc Program in Mineral Resources Management	Coordination of MSc program	Faculty of Sciences
23	MSc Program in Wood Technology	Coordination of MSc program	Faculty of Agronomy and Forest Engineering
24	Strengthening the role of Marine Biology Research Station on Inhaca Island in Research for Sustainable Management of Coastal and Marine Habitats	Coordination of the Project	Faculty of Sciences

Annex 6 – Breakdown of Subjects by Field for Scopus Data

Category in this evaluation	Categories included from Scopus data
Natural Sciences and Mathematics	Chemistry, Earth and planetary sciences, Materials science, Mathematics, Physics, and Astronomy
Social sciences, arts, and humanities	Arts, Humanities, Psychology, and Social Sciences
Medicine and Health Sciences	Dentistry, Health professions, Immunology and microbiology, Medicine, Neuroscience, Pharmacology, Toxicology and Pharmaceutics
Engineering, Energy, and Computer Science	Chemical engineering, Computer science, Energy, Engineering
Business and Economics	Business, Management, Accounting, Economics, Econometrics, Finance
Agriculture, Biology, and Veterinary Sciences	Agricultural sciences, Biological sciences, and Veterinary sciences
Biochemistry, Genetics, Molecular Biology	Biochemistry, genetics, molecular biology
Environmental science	Environmental Science
Multidisciplinary	Multidisciplinary

Annex 7 – Organogram UEM



Evaluation of Swedish government research cooperation with Eduardo Mondlane University, Mozambique 2011-2016

This report presents the findings, conclusions and recommendations of an Evaluation of Swedish government research cooperation with Eduardo Mondlane University, Mozambique. The purpose of this evaluation is to analyse, assess, generate knowledge, and provide lessons from the Swedish government funded research cooperation with Mozambique, with a main focus on the period 2011-2016. The evaluation results will also inform the design and improvement of performance of future support to Mozambique 2017-2022.

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