2014:39 Sida Decentralised Evaluation

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Evaluation of the Swedish government funded research cooperation support to Uganda

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The views and interpretations expressed in this report are the authors' and do not necessarily reflect those of the Swedish International Development Cooperation Agency, Sida.

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Abbreviations and Acronyms

CAES	College of Agricultural and Environmental Sciences
CEDAT	College of Engineering, Design, Art, and Technology
CHS	College of Health Sciences
CHUSS	College of Humanities and Social Sciences
CMC	Change Management Committee
CONAS	College of Natural Sciences
COVAB	College of Veterinary Medicine, Animal Resources, and Bio-Security
DICTS	Directorate of Information and Communication Technologies
DRGT	Directorate of Research and Graduate Training
DSS	Demographic Surveillance Site
EDCTP	European Developing Countries Clinical Trials Programme
GDP	Gross Domestic Product
GIS	Geo Information System
GMD	Gender Mainstreaming Directorate
ICT	Information and Communication Technology
k	Thousand (e.g., 500k SEK = 500 thousand Swedish Krona)
IF	Impact Factor (a measure used to evaluate the importance of journals)
KI	Karolinska Institutet
KTH	Royal Institute of Technology
Lab	Laboratory
M	Million (e.g. 25M SEK = 25 million Swedish Krona)
M.A.	Master of Arts
M.Sc.	Master of Science
MaK	Makerere University
MDG	Millennium Development Goal
MFPED	Ministry of Finance, Planning and Economic Development
NDP	National Development Plan
Norad	Norwegian Agency for Development Cooperation
NRC	National Research Council

PEAP	Poverty Eradication Action Plan
Ph.D.	Doctor of Philosophy
R&D	Research and Development
SEK	Swedish Krona
SGS	School of Graduate Studies (obsolete)
SLU	Swedish University of Agricultural Sciences
SMART	Specific, Measurable, Attributal, Realistic and Time bound
SME	Small and Medium Enterprises
STI	Science, Technology and Innovation
TSP	Total Student Population
UNCST	Uganda National Council for Science and Technology
URAFR	University Research Academic, Administrative and Financial Reforms

Preface

This evaluation was contracted by Sida through the Framework Agreement for Sida Reviews, Evaluations and Advisory Services on Results Frameworks and conducted by SIPU International. The evaluation team consisted of Stein-Erik Kruse, Matti Tedre and Godfrey Kayobyo.

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

Executive Summary

BACKGROUND AND PURPOSE

The Swedish research cooperation with Uganda was initiated in 2000. The main objective of the bilateral research cooperation has been to enhance capacity of public higher education institutions to conduct and sustain strategic and high quality research that will contribute to the development needs of Uganda and beyond by building a critical mass of independent researchers.

The current agreement 2010-2014 entails support to 105 PhD students, 42 MA students and 20 Post-Doc researchers in 12 different units. Institutional support goes to libraries, laboratories, the Iganga/Mayuge Demographic Surveillance Site, academic quality assurance, gender mainstreaming and to Makerere University's research, administrative and financial reform.

The purpose of the evaluation was to analyse, assess, generate knowledge and provide lessons from the research cooperation. The evaluation covers the bilateral research cooperation programme with MaK and the four regional partner universities during the period 2010 to 2014 including the students carried over from the previous period.

MAJOR FINDINGS

- **Training and publication outputs**

Training outputs were modest in terms of doctoral graduates and low in terms of master's graduates. Output in terms of publications and presentations was low with a high price tag per publication, except for the health sciences sub programme, in which research output and cost-efficiency were excellent. Active conference participation increased the university's visibility in the international arena and linked Makerere's researchers with the international research community.

- **Role of Swedish partners**

The role of Swedish partners was important for quality and productivity of students. Without the sandwich arrangement, which enabled students to focus on their studies even for short periods of time, the outputs would have been lower and of poorer quality. The incentive structure requires improvement and alignment with roles and responsibilities.

- **Partnerships**

Partnerships with the other four public Ugandan universities were one-sided and there were no clear signals of intention to treat universities as equal partners in the collaboration.

- **Library**

Libraries' digitization effort struggled with procurement problems, yet there was tangible progress in digitization of Makerere's own publications. The library was able to better serve its user base by providing a broader range of e-resources. Some digital libraries are, however, prohibitively expensive, and subscription to many central databases is reliant on donor support, but the university has increased its support to the library. Workforce shortage led to shortcomings in staff training.

- **Crosscutting courses**

Crosscutting courses were a clear and definite success. The courses were well planned and pedagogically sound, and they offer generic knowledge that all stakeholders perceived as valuable and productive. Some of the courses had a transformational effect on students' thinking, and would serve master's students and staff members well at a university-wide scale.

- **ICT**

Investments in ICT infrastructure were crucial for maintaining the level of services with a rapidly growing user base and ICT uses. Reliability and robustness were improved. The planned ICT strategies for other public universities were unavailable.

- **Institutional reform**

The institutional reform process has triggered fundamental changes to MaK including, more decentralized decision-making procedures, strengthened financial management, shortened examination periods and improved academic delivery. Institutional support to gender mainstreaming has been instrumental for MaK's achievement to be a model university on gender issues in East Africa. However, inadequate support systems remain a key barrier to women´s participation in research and consequently fast progression in the academic ranks and leadership.

- **Research processes**

MaK recognises and encourages research. However, the proposed research units and posts in the colleges are yet to be established while teaching workload impairs staff to focus on research. There are clear and competitive processes for selection of research grants. The programme achieved its target of supporting 20 post-doctoral researchers. The college/faculty research funds enabled mainstreaming the programme into some colleges, supported mid-level researchers to conduct research and produce grant winning proposals for their PhD studies from other funding agencies.

Processes for identification of research topics and approval/selection of proposals ensure that the research is well aligned to national development priorities. Processes

for following up masters and Ph.D. students are elaborate and ensure quality. Programme interventions have contributed to increased rigor in management of research. For instance, four research ethics committees have been established at the College of Health Sciences and approved by Uganda National Council of Science and Technology.

The university has made efforts for knowledge transfer and commercialisation of research outputs, but capacity is limited.

- **Research management**

The programme has contributed to improved research management at MaK. Clear structures for research management are in place. Programme coordination has incorporated lessons and experiences from previous phases. However, coordination of the Sida programme places significant demands on time and effort of DRGT staff as well as the unit coordinators. There is need to deepen decentralisation in research management, through college based grant units. The KTP Unit was established in DRGT in 2010.

- **Infrastructure**

Programme investments in ICT, library, GIS and DSS coupled with acquisition of equipment in college based laboratories following implementation of research projects has improved the environment that supports research. Limitations still exist with respect to adequacy of laboratory equipment, malfunctioning software at the DSS and updating of software at the GIS laboratory.

- **Innovation and cluster programme.**

The Innovation Systems and Clusters Programme is a University wide programme implemented at the College of Engineering, Design, Art and Technology. The programme aims at enhancing the competitiveness of Uganda´s businesses locally and globally through innovation systems and cluster initiatives. It has made a number of achievements and experienced significant growth and expansion since 2005 with growth and expansion in the number of clusters initiated. This is an interesting, innovative and promising initiative, but it is difficult to assess its significance and impact since there have not been a sufficient assessment of the substance and future potential for the actual innovations.

- **Relevance**

The research cooperation programme is well in line with the Swedish research support policy and also supports Ugandan overall development plans and the most recent research policy emphasising the increasing role of research in the socio-economic development of the country. The more difficult questions are to what extent Swedish support remains strategically relevant to further growth and development of research in Uganda. The evaluation pointed to some limitations:

The Swedish support focuses on the first two levels of institutional development – strengthening capacity of individual researchers and MaK as an organisation. There are so far weaker links and efforts to influence the system level as such – the national policies, institutional structures and financing of higher education including researcher training and research. However, Sweden has raised several issues around harmonisation and donor coordination in the higher education sector in the dialogue with the government.

The Swedish support has clearly been relevant and useful for MaK for a long period of time, but less so for the other four regional public universities. Partner public universities came on board during this phase, none of the supported students has graduated so far, and a number of them have dropped out.

The modus operandi of the Swedish support is not optimal for MaK. It is presented as a research programme, but within MaK it is managed as a distinct Swedish programme with its own account, Steering and Implementation Committees and Secretariat. There are no active coordination mechanisms within the higher education sector, but Sweden maintains communication with other external donors.

A number of interviewees from different levels considered it problematic that the research support of Sida, albeit much broader than many other donors, is limited to topics Sida considers central to development. However, the underlying problem is the weak funding of research from the government.

- **Sustainability**

A major achievement of the Swedish support is an enhancement of the academic sustainability at MaK. More staff have completed their Ph.D.s, Post Doc researchers are trained and provided research opportunities, relevant and promising research has been conducted and infrastructure for research has been strengthened. Funding of research training and research remains the most critical issue for MaK. Sida and other external donors have been and still are the primary source of funding for researcher training and research. The university allocates UGX 2 billion (USD 800,000) as annual research budget support part managed centrally and in colleges.

- **Wider impact**

The main findings about longer-term effects are:
MaK has made deliberate efforts to select and prioritise research projects with high relevance and potential development impact.

Most of the research projects have a high score on social relevance and utility.

There are increasing, but not sufficient efforts to disseminate and follow up results from research projects.

Certain academic staff are used as advisors and preferred consultants by the government, but the links between the university and government, private sector and civil society is weak.

Several research projects have a potential direct utility and impact, but in most cases the effects are indirect and long-term.
The Sida financed research contributes to create conditions and support processes that may lead to poverty reduction, but insights into the quality and impact of research would require another study.

Future options
The Swedish research cooperation with Uganda started in 2000 and has as such been going on for nearly 14 years. This evaluation has documented positive results at individual and organisational levels. Qualified researchers are educated in a broad range of priority areas for Uganda. Organisational capacities are strengthened and the socio-economic relevance and impact of research are enhanced. The programme still suffers from internal and external inefficiencies, but the most critical and difficult question is to what extent there is a need for change so that the same resources could be used more efficiently and effectively in the future.

There are no clear answers to such questions, but the report presents and discusses options through a number of different scenarios. The scenarios are of a broad strategic nature. The first two focus on MaK and represent modifications and reforms of the current strategy, while the next open up for broader support to also other institutions.

Scenario 1: Stronger focus on thematic research areas
The current programme of support is broad and covers a wide range of thematic programmes and types of interventions. Based on a request from the Swedish Embassy, MaK prepared a "Concept Note for Uganda-Swedish Research Cooperation 2015-2020". The note is based on the current programme, but seeks to introduce new ideas and shift the balance between various components in the programme. The proposal addresses some of the limitations and imbalances in the current programme and represents a logical and constructive progression.

It is a broad programme - even broader than the previous and embodies a mix of expectations and aspirations from university stakeholders. A basic premise is also that MaK is and shall remain the dominant research university in Uganda.

Scenario 2: Harmonised donor support
There is a broad range of external donors to MaK supporting various thematic areas and colleges. There is some communication between donors, but the actual coordination of planning and reporting processes is marginal or absent. The Swedish programme is prepared separately and bilaterally with MaK.

The principles of harmonisation and alignment are not practiced within the higher education sector in Uganda. A desirable alternative for MaK would be increased core or institutional support to a joint research strategy and research programme based on consultations with all relevant donors. If the substance of such a programme and the supporting financial and managerial processes were found adequate in a joint appraisal – this scenario could be an alternative for the donor community.

The next two scenarios go further and explore alternative/supplementary options to the almost exclusive focus on MaK. The arguments are: Firstly, Sida has provided support to MaK for a long period of time and time may have come to change focus and balance. Secondly, there is a need to create a more pluralistic research structure and culture in Uganda. There are quality researchers in other universities than MaK in need of financial support. There are two possible options: establishing a national competitive research fund and/or shift more resources to the other universities.

Scenario 3: Support a national research fund
Grant support for research allocated on a competitive basis is practiced on a very small scale in Uganda, and mainly at Makerere University. A competitive national fund will issue calls for proposals. Qualified researchers from all Ugandan research institutions can apply. It will also be competitive and only high quality proposals will be funded. This is the normal system in many countries.

The idea of promoting a research culture in which conventional standards for managing scientific activities apply, suggests that the fund model should be placed at the research council level, but it presupposes that an effective system is in place in which all parts are seen as interdependent and objective actors. A governance and decision making system perceived as transparent, efficient, professional and fair is required.

Scenario 4: Increased support to regional universities
The other four public universities were included in the programme for the first time during this phase. They have benefited from the programme, but only indirectly through MaK and only marginally. If justified through a more systematic assessment, Swedish support could be used to strengthen the capacities in one or all the other public universities through more direct and larger support. We have not assessed to what extent this is feasible and should happen, but suggest it is a possible scenario.

1 Introduction

1.1 BACKGROUND

The Swedish research cooperation with Uganda was initiated in 2000 and consisted of institutional research capacity strengthening. To contribute to the establishment of a coherent agenda for research and researcher training in Uganda, the support was mainly focused at Makerere University (MaK), the largest public university in the country. There has been three consecutive agreement periods, which have amounted to SEK 315 million. The current agreement period 2010-2014 amounts to SEK 180 million (total support 495M SEK).

The programme was built around international research collaboration, principally with Swedish universities. The programme aimed to support MaK towards its goal of becoming a vibrant, internationally competitive research university. During the current research agreement 2010-2014 four other public universities entered the cooperation: Kyambogo, Busitema, Gulu and Mbarara University of Science and Technology, but the support to those universities has been channelled through MaK.

The main objective of the Swedish bilateral research cooperation to Uganda has been to enhance capacity of public higher education institutions to conduct and sustain strategic and high quality research that will contribute to the development needs of Uganda and beyond by building a critical mass of independent researchers.

The current agreement 2010-2014 entails support to 105 PhD students, 42 MA students and 20 Post-Doc researchers in 12 different units. Institutional support goes to libraries, laboratories, the Iganga/Mayuge Demographic Surveillance Site, academic quality assurance, gender mainstreaming and to MaK´s research, administrative and financial reform.

1.2 PURPOSE

According to the Terms of Reference[1], the purpose of the evaluation was to analyse, assess, generate knowledge and provide lessons from the research cooperation. The

[1] See Terms of Reference Annex 1.

evaluation set out to describe and assess past progress, with focus on the future direction and management of the support resulting in concrete and realistic recommendations, regarding outputs and outcomes, specifically:

(a) Assess to what extent the programme has contributed to the expected outputs, outcomes and impact, and the sustainability of these results.
(b) Assess the efficiency of the programme design, organisational set-up and co-operation partners in the delivery of expected outputs.
(c) Provide recommendations for the possible future programming phase (2015-2020).

The evaluation covered the bilateral research cooperation programme with MaK and the four regional partner universities during the period 2010 to 2014 including the students carried over from the previous period. According to the agreement, the support to the other four public universities was to be channelled through MaK, and the Ph.D. students were to be registered at MaK for their education. Sida also supported institutional collaboration between MaK and the four universities in research management, quality assurance, gender mainstreaming, ICT, and libraries.

1.3 FOCUS AND APPROACH

The focus of the evaluation was on the capacity building aspects at MaK. This is by far the largest university in the country. The assessment of the other four universities focused on the contribution for strengthening the research environment as perceived by the partner universities and the interaction with MaK.

The Terms of Reference include a large number of questions in three areas:

(a) Institutional capacity for research.
(b) The production of scientific results and the quality and relevance of those results.
(c) The societal impact of building institutional research capacity.

Our starting point has been levels (a) and (b) — the capacity for research strengthened and the actual production of scientific results. However, the ambitious long-term objective of the programme was to contribute to national development and alleviation of poverty. This relies on the assumption that the development of human resources through more and better analytical capacity and research are prerequisites for social and economic development.

However, there are no direct causal links between support to research and alleviation of poverty, so it is not possible to measure impact directly. We have followed a bottom-up approach in the assessment of results. First, established to what extent the programme has been implemented - that people have been trained and research carried out as expected. Secondly, assessed to what extent the internal organisational capacity has been strengthened. Thirdly, analysed the relevance of the research.

Fourthly, we have searched for evidence that the research has been used for practical and productive purposes. This is as far as we can get. Measuring the long-term impact will require another and different type of evaluation, which should be done later.

Hence, the evaluation consists of three major building blocks:

- Research analysis: A descriptive presentation and analysis of the production of scientific results.
- Capacity analysis: A descriptive presentation and assessment of institutional capacity at all five universities, but with a main focus on Makerere University.
- Results analysis: A quantitative and qualitative assessment of relevance and use of research – and to the extent possible its short- and more long-term outcomes and impact.

1.4 METHODS

The evaluation has been carried out in three phases. The Inception phase was mostly descriptive and served to map the actual production of research and existing research capacity (inputs and outputs)[2]. The description covered all the five institutions over the period 2010-2014. The second phase moved towards the analytical and evaluative processes including visits and interviews with programme partners and stakeholders[3]. A debriefing workshop for embassy staff, local stakeholders and the evaluation team was organised at the end with the purpose to share and discuss major findings of the study, and to inform the drafting of the report. The third phase consisted of synthesising all findings and observations and prepare a draft report. The draft report was shared with the embassy and the Ugandan universities. On the basis of the discussion and written comments, the report was finalised and submitted to the embassy.

Terms of Reference consist of a large number of factual questions, such as expenditure, total number of MAs/MSc/PhD graduated, publications, and conference attendance. The university primarily provided such data. The Ugandan team member was responsible for collecting basic quantitative data as part of the Inception phase.

We conducted approximately 90 interviews during the field phase and the main types of interviews were: (a) Staff and students at Makerere University, including programme coordinators or contact persons, recipients of faculty research funds, academic staff members involved in teaching, supervision and research for all research areas

[2] See Annex 3: References

[3] See Annex 2: People met

supported by Sweden, senior management, Ph.D./Masters students and post doctoral researchers (focus groups), (b) representatives from the other four public universities (joint meeting), (c) members of the Programme Steering Committee, (d) government officials from relevant institutions and donors.

All interviews were semi-structured, based on questionnaires/interview guidelines prepared during the inception phase (included in the Inception report). Seven Swedish coordinators representing six Swedish universities (KI, KTH, GU, LU, SLU, and UU) were identified by Sida. A subset of questions from the master questionnaire was posed to those coordinators related to the collaboration between Swedish and Ugandan universities, tangible and intangible benefits of collaboration, and the changing role of the "sandwich model".

Compilation of statistics from citation indices concerning relevant Ugandan publications, references to relevant Ugandan research, as well as other indicators of usage was used to assess relevance and use of research. The main citation index used was Elsevier's Scopus, covering 21000 academic journals from 5000 publishers. The publication and citation indicators were compared in East African, African and international contexts. This programme's research output is reflected on the country-level statistics from Scopus.

The quality assurer reviewed the draft of the inception report and the draft final report, making sure that the documents correspond to Sida standards.

1.5 LIMITATIONS

The challenges and limitations in this evaluation are:

- A comprehensive ToR with a large number of questions and a relatively short time frame for the evaluation.
- Complex processes involving short- and long-term change are difficult to capture in an evaluation such as this. Longitudinal data are required to study change.
- Different institutions and settings are likely to affect outcomes – meaning that findings may not be possible to generalise.

At the first two levels of analysis (research products and capacity), we were able to provide solid evidence using information from available data and information, but there were several gaps and weaknesses in existing reports - making it difficult to determine exactly financial expenditures and research outputs (no. of graduates and reports). It was even more difficult to assess the medium- and short-term effects of research. The effects are most often catalytic, indirect and long-term. An evaluation of discrete research projects faces challenges in trying to judge to what extent the outcomes and impact can be attributed to specific research efforts and interventions, when a range of other external factors are likely to have made a difference. The

changes and improvements in the production of research and improvement of capacity have also been supported by several other donors and cannot be attributed to Sida alone. Another study would be required to assess quality and medium-/long-term effects.

In order to mitigate these limitations, we used the following strategies:

- Focusing on the key evaluation issues as established in the ToR, adding value to analysis from the investigation of their interrelationships and through argumentative interpretation, supported by an extensive review of documents and previous studies.
- Triangulating information from (even limited) different sources, in order to make their applicability and validity explicit.
- Sharing and verifying the evaluation results with some of the key stakeholders.

2 Research Programme and Context

2.1 POLICY AND PROGRAMME

The overall goal of the programme is "*to enhance capacity of public higher education institutions to conduct and sustain strategic and quality research that will contribute to the development needs of Uganda and beyond".* This goal will be met by focusing on training to Masters and doctorate levels, as well as postdoctoral research (Programme document 2009).

The capacity objectives are to:

- Strengthen Makerere's research capacity through new and existing multi-disciplinary research teams in science, technology and innovations.
- Promote basic and applied research to generate, and utilise new knowledge that contributes toward policy development and improvement of people's livelihoods.
- Increase the number of Ph.D.'s and Masters degree holders in four other public Universities.
- Develop and implement strategies for deepening local and international partnerships, including national research systems to attract and manage research grants, undertake joint academic and research programmes, supervision, mentorship and publications.
- Provide specialised ICT, library, field and laboratory facilities for centres of excellence earmarked to spearhead research, innovation and technology development.
- Strengthen capacity for programme administration, research management and coordination at the School of graduate studies and other units at Makerere University.

According to the programme, Makerere University was to implement the following activities in the four years 2010-2013:

- Training 40 academic staff at Makerere University and other public universities to Masters degree level.
- Supporting 75 on-going PhD students to complete their studies by the end of 2011.
- Training 75 PhDs (55 from Makerere and 20 from the partner universities).
- Supporting thematic research by providing for purchase of equipment, consumables, travel, field allowances, subsistence and guest lecturers.
- Supporting competitive research grants, cross-cutting courses, field site (DSS).
- Supporting regional collaborations and networks.

- Supporting dissemination strategies, conferences and publications.

The following outcomes were expected:

- Increased capacity to carry out quality and relevant research at MaK.
- Enhanced capacity for supervisors to supervise Masters and Doctoral studies.
- Increased research productivity contributing to enhanced visibility of the university among its peers.
- Evidence-based policy making in the areas of health, agriculture, good governance, human rights, conflict resolution, and environmental safety among others.
- Increased capacity to teach and potential to conduct research in other public universities.
- Increased generation and uptake of new technologies.
- Centres of excellence developed to incubate available technologies e.g. waste management.
- Improved research management and coordination in Makerere.
- The environment for research further improved (through provision of quality library and ICT resources, laboratory infrastructure, DSS).
- Increased collaboration with other research institutions and universities nationally and thereby strengthening the national research system.

Makerere University – a brief overview
Makerere College was established in 1922 as a technical college and became affiliated to the University of London from 1949-1963. The College became one of the three constituent colleges of the University of East Africa from 1963–1970. Makerere University became an independent University in 1970 by Act of Parliament. This status continued until 2001 when the Universities and Other Tertiary Institutions Act was enacted.

Vision: To be the leading institution for academic excellence and innovations in Africa
Mission: To provide innovative teaching, learning, research and services responsive to national and global needs

MaK officially transformed from a faculty-based into a collegiate mode of governance with nine Colleges and one School of Law in 2011. For academic year 2013/14, there are 142 undergraduate (15 diplomas & 127 bachelors) programmes and 131 postgraduate (12 postgraduate diplomas and 119 masters programmes). All colleges have the provision for offering Doctoral Degrees either by research only or course work and dissertation.

The research thrusts to guide Makerere University for the next five years are (2013-18):

- Health and health systems
- Agricultural (crop & livestock) transformation food security and livelihoods

- Natural resources management and climate change
- Education and education systems
- Governance, culture, visual arts, social justice, communication and sustainable development
- Science and technology

Crosscutting research areas:

- Biotechnology
- Knowledge translation
- Gender
- Human resource development

The MaK Strategy 2008/09-2018/19 was formulated to reposition the university to address emerging development challenges arising from globalisation, evolving national socio-economic developments, information and communication technology, the Millennium Development Goals and overarching national government policies such as Poverty Eradication Action Plan (PEAP), the draft National Development Plan (NDP), Strategic Plan for Higher Education 2004-2015, decentralization and affirmative action.

MaK seeks to be the leading institution for academic excellence and innovations in Africa. This will be achieved through providing innovative teaching, learning, research and services responsive to national and global needs. Strategically, the University is to be steered in the direction of a learner-cantered problem-based instruction, a research driven university where research and teaching/learning are actually reinforcing, and knowledge transfer partnerships and networking between the University on one hand, the public and private sectors on the other.

MaK plans to increase the number of graduate students to 38 000 (with 7600 graduate students) by 2018. At the recommended staff/student ratio of 1:15, the university will need to train 720 academic staff to PhDs and 720 to Masters degree in order to meet the required establishment of 2530 academic staff.

2.2 NATIONAL RESEARCH CONTEXT

Over the past couple of decades, ‘globalisation’ and the emergence of the ‘knowledge economy’ have given rise to new economic, social, political and cultural challenges to which higher education institutions are responding. Such institutions are seen by many as playing a key role in delivering the knowledge requirements for development (Cloete et. al. 2012) . Research has, for example, suggested a strong association between higher education participation rates and levels of development. While the higher education participation rates in many high-income countries are well over 50%, in sub-Saharan Africa they are in most cases below 5% (Bloom *et al.* 2006).

To make this contribution, science, technology and innovation (STI) must be inte-

grated in the national development planning process. Over the years, the integration of STI in Uganda's national development planning has been more implicit, than explicit. Broad intentions to use STI as the vehicle for economic growth were evident in the country's comprehensive development framework such as the Poverty Eradication Action Plan (1997 – 2008/09) and the National Development Plan (2010/11-2014/15). However, strategies of how to use it to bring about the desired outcomes of economic growth were lacking.

Only recently has STI been given more prominence in Uganda's National Development Plan (NDP) 2010/11 – 2014/15. The NDP stipulates Uganda's medium-term strategic direction and development priorities, focusing on growth, employment and socio- economic transformation for prosperity (Ministry of Finance, Planning and Economic Development, 2010). The plan recognizes STI as a sector that provides institutional and infrastructural support to the production of goods and services.

Significant reforms in Uganda's research system occurred in the late 1980s and early 1990s (Ecuru, Julius (2011). Prior to that period, research was integrated within government line ministries, e.g. Ministry of Agriculture, Ministry of Health, and in universities (basically Makerere University). Research was coordinated then by the National Research Council (NRC), established in 1970 by a cabinet decision. The NRC had responsibility for research oversight and advising on national research policy; and was also a research funding arm of the government. The NRC was replaced in 1990 by the Uganda National Council for Science and Technology (UNCST). During the structural adjustment processes in the late 1980s and early 1990s, specialized institutions were set up to undertake research. The National Agricultural Research Organization was for instance established in 1992. The reforms left government line ministries with a mandate for policy and regulation, while research was to be undertaken by academic and research institutions.

There is not yet a separate ministry for science and technology in Uganda. The Ministry of Finance, Planning and Economic Development (MFPED) is currently the parent Ministry for UNCST. The placement of UNCST within the MFPED is not clear to many people, but the reasons are said to be: (a) science and technology is crosscutting and would best be located within a crosscutting ministry, (b) science and technology is or should be an integral part of socio-economic and development planning. These reasons notwithstanding, there has been a strong wish from the scientific community to have a separate ministry for science and technology. It is argued that this would enable better articulation and representation of science, technology and innovation matters at the highest political level, and also enhanced support to research and technology development.

Total estimated R&D spending from all sources combined increased from Ushs. 31 870 million in 2003/2004 to Ushs. 82 249 million in 2007/2008. Between 2006/2007 and 2007/2008, R&D spending rose by 56% from Ushs. 54 689 million to Ushs. 82 249 million. Excluding expenditure by the private non-profit sector, spending rose by 62% from Ushs. 38.017 million to Ushs. 61,717 million in the same period (see

UNCST Status Report 2009/2010 and Ecuru 2011).

The main sources of public R&D funding have been government treasury and the donor community. The contribution from Government treasury rose by 25% between 2006/2007 and 2007/2008, while the donor contribution or 'funds from abroad' increased by 53% in the same period. Most expenditure on R&D in the higher education sector has been from abroad.

Uganda's R&D performance as a percentage of GDP has fluctuated between 0.2% and 0.5%. This is far below the recommended spending of at least 1% of GDP on R&D for African states. The African Union Summit in early 2007 recommended that African States should spend at least 1% of their GDP on R&D in order to foster growth and economic development in Africa. In contrast, developed and emerging industrialized countries spend at least 2% to 4% of their GDP on R&D.

2.3 UGANDAN UNIVERSITIES

The university system in Uganda has two major segments: the public funded university system (5 or 27%) and the privately funded universities (29 or 73%). The number of registered universities increased from 29 in 2010 to 34 in 2012, an increase of 30% compared to only one awarding institution in 2006.

In 2011, the total enrolment in Higher Education was 198 066 students. The State of Higher Education Report of 2010 further indicated that students registered for science and technology reduced from 64 179 (37% of enrolled students) in 2010 to 51 322 (32%) in 2011. Those registered for arts and humanities were 146 744 in 2011. Although the enrolment of female students did increase in absolute numbers from 75 953 in 2010 to 86 235 in 2011, the relative proportion has remained the same. The gender distribution in the university sub-sector in 2010 was as follows: females accounted for 44% (80 391) compared to males at 56% (103 594).

Growth in academic staff has lagged behind the growth in student enrolment. While student numbers in 2010/2011 grew by 14.2%, that of academic staff grew by only 10.8%. In 2005, the number of academic staff was 5258 and this grew to 6465 in 2006. In 2010, the number had grown to 7785 and 8702 in 2011. This is a modest growth since 2005. The number of females was still low compared to that of males (1990 females against 5134). The number of staff with Ph.D. qualifications had grown from 549 in 2004 to 858 in 2010 and 914 in 2011, which is about 80% of all Ph.D.s in the country.

Makerere University, until about ten years ago was the sole local provider of graduate training in Uganda. However, a number of other universities have since been established, which offer graduate training especially at Masters level. The next table shows the number of graduate training programmes in five universities in 2007. The Swedish programme has offered an opportunity for four public universities to build re-

search capacity. These are Kyambogo University, Busitema University, Mbarara University of Science and Technology and Gulu University.

Table 1: Graduate training programmes in five public universities

Field	Makerere (TSP*=33,488)		Mbarara (TSP = 3,000)		Kyambogo (TSP = 10,193)		Gulu (TSP = 3,347)		Busitema (TSP = 350)	
	Masters	PhD	Masters	PhD	Masters	PhD	Masters	PhD	Masters	PhD
Food &Agri-culture	17	7	Nil	Nil	-	-	-	-	-	-
Engineering	16	8	Nil	Nil	-	-	-	-	-	-
Health Sciences	15	15	9	2	-	-	-	-	-	-
Natural Scienc-es	11	9	6	-	1	-		-	-	-
Education	40	2	1	-	-	-	1	-	-	-
Social Sciences	27	3	1	1	2	-	2	-	-	-
Total	**126**	**44**	**17**	**3**	**3**	**0**	**3**	**0**	**0**	**0**

2.4 UGANDAN RESEARCH OUTPUTS

One of the most reliable, and most used, ways of measuring research output on an aggregate level is looking at publication and citation indices. Publications from most major academic publishers are recorded and indexed in bibliographic databases, which include, for instance, the well-known Scopus, CiteSeer, and Web of Science indices. Each journal, for instance, records each article's authors and their affiliations, as well as how many times other researchers have referred to that article. Although a measure of how many times others have referred to an article does not measure that article's quality, the number of references to an article is a common measure for an article's *impact* in its research field.

Each citation index records articles slightly differently and allows different kinds of data to be extracted. Scopus, which is the citation index used in this evaluation, offers extraction of country-level and discipline-level data from 5000 publishers and 21 000 titles (SCImago, 2014). The same database (Elsevier, 2014) also provides per-university data. Other data necessary for this evaluation included population data for weighted averages, which was extracted from the World Bank (2014) database. In

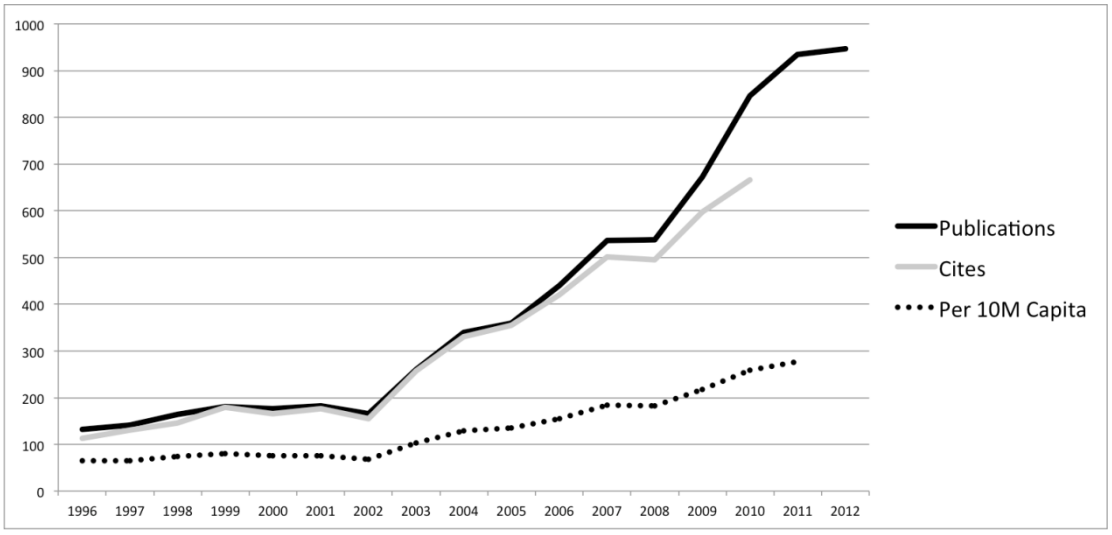
order to portray a broader, historical perspective of Ugandan research, the starting date for analysis was extended to 1996.

2002–2012: A Decade of Rapid Growth

In the mid-1990s Uganda's university sector was not well developed, which limited Uganda's research output by all measures. The country's research output, as measured by indexed research publications, was well below its neighbouring Kenya and Tanzania, and diminutive in the world scale. In 1996 Uganda's publication output was 138 articles—well below Tanzania's 239 and Kenya's 634 the same year. With that output, Uganda's output was about 0.8% of that of Sweden at the time (17 000 articles per year)—which well reflects the small number of Ph.D. holders and professional researchers in Uganda at the time. That number constituted 0.01% of the world's publishing activity.

The numbers remained low for the rest of the 1990s, but the year 2002 marked a turning point, after which Uganda's research output started to grow very fast. Similar to the neighbouring Tanzania, Uganda's annual growth of research output was phenomenally fast. While research output in Europe grew at 6% per annum, Uganda's average annual growth between 2003 and 2011 was 22%, with record years in 2003 (+58%) and 2004 (+30%). International collaboration in research articles grew slightly and stabilized around 2003 to about 80% of articles being produced in international collaboration (of Swedish articles, 56% of articles are done in international collaboration, and the number is slowly growing). The figure below presents the number of publications with Ugandan authors, the number of citations to those publications, and the growth of Uganda's research output per 10 million people.

Figure 1: Uganda's Research Output and Impact 1996–2012

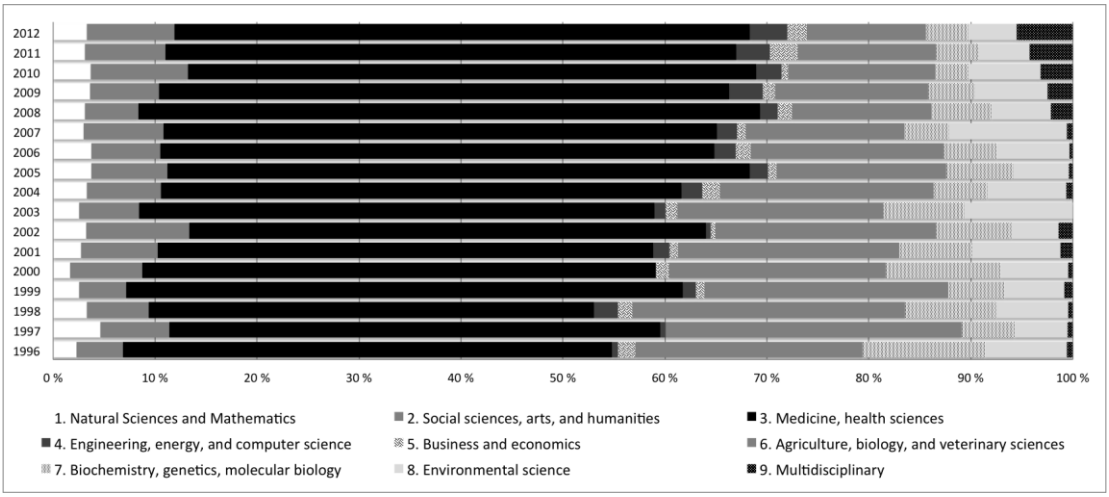


Publication Profile: What Fields Get Published?

The focal areas of publishing activity have slowly changed between 1996 and 2012 (see figure below). The most significant trend in the country's publication profile is the decreasing relative importance of agricultural, biological, and veterinary sciences.

Agricultural and biological sciences dropped in relative importance from almost one in four publications (22.3% in 1996) to one in nine publications (11.7% in 2012). Throughout the analysis period, medicine played a central role in Uganda's publication activity, with more than half of Uganda's publications coming from medicine and a number of closely related fields. The impact numbers, as measured by cites per document, are not notably different between Western Europe and Uganda.

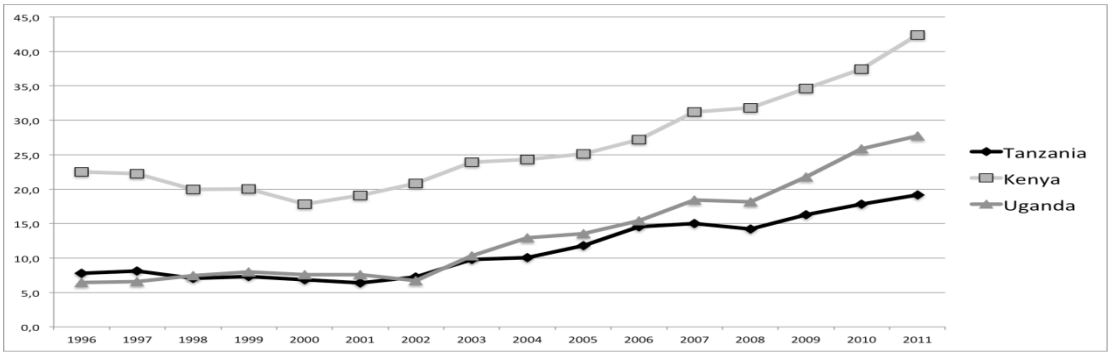
Figure 2: Publications in Uganda per Field and Year (Some Fields Combined) (Scimago, 2014)



In 2012, 56.5% of publications with Ugandan authors came from the field of medicine. A distant second was agricultural and biological sciences (11.7%), and the broad range of social sciences, arts and humanities (8.6%). Ugandan publication profile is very medicine-dominated, and there is a significant shortage of research in business and economics, natural sciences and mathematics, and engineering and computer science research (less than 4% each). The medicine's domination can also be seen in the ranking of external research partners of Uganda's largest university, Makerere University: That list consists chiefly of medical institutes and universities with strong medical schools.

Over the period between 1996 and 2012, Uganda's rapid growth has increased the country's share of the world's research output from 0.01% to 0.04%—still small but constantly growing. Continentally speaking, Uganda is eighth highest ranking country in Africa, after South Africa, Tunisia, Nigeria, Algeria, Morocco, Kenya, and Ethiopia. Regionally speaking, Tanzania and Uganda developed at a similar pace in the beginning, but the watershed year was 2006, after which Uganda has been able to ramp up her research productivity faster than Tanzania has (figure below). Kenya still leads the East African countries in terms of raw as well as proportional research output.

Figure 3: Research Output of Three East African Countries (Per Million People)



3 Research and Capacity Building Results

Sida's programme was aimed at improving the capacity of Ugandan higher education institutions to conduct strategic, societally valuable, and high quality research. The primary instrument for building a critical mass of independent researchers was doctoral training, which, in many cases, produces both degrees and publications. Doctoral degrees and publications were used as two main indicators of success in terms of research. This section describes research and capacity building results in the programme in terms of training outputs and publications. The section also presents a number of other relevant details concerning capacity building: efficiency, partnerships with Ugandan and Swedish universities, library development, and crosscutting courses.

3.1 TRAINING OUTPUTS

The programme's training component focused on providing master's and doctoral training for full-time staff members of Makerere and, to some extent, Kyambogo, Busitema, Gulu, and Mbarara universities. Master's studies were provided by Makerere university, and doctoral studies were done under various kinds of arrangements: Some students were primarily trained by the Swedish partners, with Ugandan collaboration; other students were primarily trained by Makerere, with Swedish support and co-supervision; and some students were trained completely at Makerere without a notable Swedish component. Examples of the first were found, for instance, in the college of health sciences, of the second in the college of science, and of the third in doctoral training of partner universities' staff members.

The training plan and targets changed throughout the programme life cycle, but there was no consolidated programme document to establish the final targets. The results matrix of February 24, 2010 set the target of master's student training to 60 finished graduates by June 2014, and the target of doctoral training to 100 finished Ph.D. graduates and 50 more in training.[4]

[4]Appendix 2 of 20 February 2010 Agreement on Research Cooperation Between Sida and Makerere University During 1 January 2010–30 June 2014: "*Overall Results Assessment Framework for the Period Jan 2010–June 2014.*"

Of those doctoral students who started in Sida's programme Phase II, 31 were carried over to Phase III, and received funding from Sida to finish their studies. DRGT's report to Sida on March 7, 2014, reported that in the peak year, 2012, there were 102 doctoral students altogether. The largest number of master's students was achieved in 2013, with 67 students. A comparison figure, collected from the individual colleges and programmes, gives slightly different figures: 113 doctoral students and 54 master's students. The discrepancies between the two figures arise from different ways of counting who graduated within the Sida funded programme. The first five rows in the table below present DRGT's numbers for each year, and the last row presents figures collected from individual programmes. The last row presents figures collated from individual programmes.

Table 2 presents DRGT's numbers for each year, and the last row presents figures collated from individual programmes.

Table 2: Number of Enrolled and Graduated Students For Each Year in the Programme (Sources: DRGT, March 7, 2014 (rows 1-5); Individual Reports from Colleges (row 6))

	Year	Students enrolled		Students graduated		Ongoing students	
		PhD	Masters	PhD	Masters	PhD	Masters
Report by DRGT	2010	89	17	3	0	86	17
	2011	93	28	3	0	87	28
	2012	102	48	6	2	90	46
	2013	100	67	6	6	82	59
	DRGT's report total	102	67	18	8	82	59
Report by colleges	Colleges' report total	113	54	33	5	65	14

Despite the large number of students in the programme, at the end of the programme by May 2014, the number of graduates remained low. DRGT's March 7 report to Sida reported 20 doctoral graduates and 8 master's degree graduates. However, an interview round in the colleges revealed 33 doctoral graduates. The colleges included students who, strictly speaking, did not meet the inclusion criteria, such as students who had received Sida funding in Phase II, but who graduated in Phase III. Never-

theless, for a more realistic picture of long-term outcomes across successive Sida programmes, it is important to include those students in the reports.

One can take two perspectives into the low outcomes. On the one hand, it is unsurprising that of those 69-71 students who started their doctoral studies in Phase III (2010–2014), few had sufficient time to graduate. It would have been unrealistic to expect anything else. By the end of the programme, most of those students had studied much less than four years, which is the usual target time for full-time doctoral studies (and those students did not study full-time). In that sense, the low outcomes in terms of Ph.D. graduates is a programmatic issue and does not indicate a problem with the universities involved.

But on the other hand, it is unexpected and worth closer look that of the 31 students who carried over from Phase II, all may have not yet graduated (the overall figures of graduates, including carried over and new students, range from 20-33 depending on how they are counted.) Some of the carried over students have already used 6-9 years for their studies and still not finished their doctoral studies. There were even examples of students who had been carried over from Phase I to Phase II and then to Phase III: those students' doctoral studies have taken more than ten years.

A closer look into master's degree graduates reveals that 17 started already in 2010, 11 more in the next year, 20 the following year, and 19 in 2013. That is, there are a good number of M.Sc. students who have spent four years on their studies, and even more who have spent three years doing their master's studies. In addition, a large number of master's students have dropped out of their study programmes. The different reports report between 14 and 59 ongoing master's students. There are a good number of reasons for the low productivity of both doctoral and master's programmes. The previous evaluation of Sida's support to Makerere[5] identified issues with lack of realistic time planning for doctoral studies and long completion times. Both issues remained in the current programme phase, and some of their reasons are discussed in the following section.

Reasons for slow progress in studies

In Sweden, full-time master's studies are typically expected to take two years, and half-time master's studies four years. Full-time doctoral studies have a target time of four years and half-time doctoral studies eight years. To ensure speedy completion for students, the agreement between Makerere University and Sida required that MaK ensures necessary study leaves for students involved, and 20% research time for staff

[5] Appendix 2 of 18 January 2010 Assessment memo: *Summary of previous results*.

members involved, as stipulated in MaK's Research and Innovations Policy. However, possibly due to continued rapid growth of student numbers and acute lack of workforce in the university—which are among the things that this programme is aimed at alleviating—MaK was not able to follow through those commitments. The most commonly reported reason for delayed completion of studies was that students, who were also permanent staff members, could not allocate enough study time among their teaching schedule.

In addition to workload issues, personal issues, and family issues, there were also a number of institutional issues that slowed down students' progress. Sida funding did not start at the beginning of 2010, but it was delayed by 6 months (although the funding part that was unused due to the delay was used later for a "boost" that gave students extended opportunities for fieldwork and Swedish visits). In addition, students reported unnecessary bureaucratic hurdles at the beginning and end of their studies. Swedish interviewees, students, and some supervisors noted that in some cases the thesis review process takes excessively long—anything up to a year (in many other countries the whole process takes from three to six months). Students outside Kampala reported that due to the need to be physically present to follow-up bureaucratic processes, studying at distance was excessively difficult. The directorate of graduate studies indeed noted that in the past some supervisors, unaware of their responsibilities in the process, had left many tasks to the students or just up in the air. DRGT is currently working on an online tracking system to improve transparency and efficiency of the process. Women had slightly more problems with time issues due to lack of support mechanisms during maternity.

3.2 PUBLICATIONS AND PRESENTATIONS

One of the key academic indicators in the programme was academic publications: peer-reviewed journal articles, book chapters, and papers in conference proceedings. Books, technical reports, patents, and other important outputs were not mentioned as indicators. In some fields, conferences are principally a venue for conferring—discussing—research, while in other fields, conferences also offer a respectable publication channel through conference proceedings.

Table 3 presents the number of publications (peer-reviewed journal articles and book chapters) and conference presentations for each sub programme.

Table 3: Publications and Presentations

Subprogram	Budget	Publications (from DRGT)	Publications (from units)	Conferences
DICTS	6,0M	9	0	8
Library	8,0M	4	4	33
Gender Mainstreaming	4,0M	7	0	0
DRGT (SGS)	35M	22	22	14

CAES (Agriculture)	8,0M	18	10	6
COVAB (Veterinary)	7,25M	9	6	20
CEDAT (Technology)	39,7M	39	38	37
CHUSS (Social sciences)	10,8M	18	8	11
CHUSS (Arts)	5,5M	32	4	0
CONAS (Sciences)	7,2M	6	6	8
Total without health sciences	**131,45M**	**164**	**98**	**137**
CHS (Health sciences)	34,5M	347	≈150*	0

* Due to unclear reporting and duplicate and incorrect entries in reports, the number is an estimate.

The figures reported by DRGT differed from the figures reported by the individual units. Numbers from the individual units are used in this report, as their correctness could be established from lists of publications. The report from CHS (health sciences) had an impressive list of publications, but the list contained a large number of double entries and entries that were not academic publications, so the figure used (≈150) is an estimate that could be much higher. Except for CHS, the total number of publications is low for the money spent. Together, the sub programmes spent 131M SEK to produce 98 (+150) journal articles and 137 conference presentations, with nearly 577k SEK spent per article / presentation. (In addition to publications, there were, of course various other outcomes).

Unsurprisingly, health sciences were a high achiever in publishing activity. The success of CHS, albeit expected, is commendable and meets international standards. Medical research is a traditionally publishing-intensive field, and the culture of frequent and early publishing is deeply rooted. CHS had an advantage over some other programmes, for a number of programmes, such as natural sciences and veterinary science, started to receive funding in Phase III, so they could not draw from a pool of uncompleted research projects at the beginning, but had to build everything from scratch. For some other programmes, research that had started in Phase II yielded publications from the beginning of Phase III.

But the low number of publications outside CHS did not indicate poor quality. Among those sub programmes where quantity was low, there were cases where quality was very high. For example, of the college of science's few publications, two were published in the journal *Environmental Science and Technology*, which the Norwegian, Australian, and Finnish rankings of academic forums[6] rank to highest level, and

[6]A number of Nordic universities use the Norwegian list of academic venues for evaluating quality of publications (dbh.nsd.uib.no/kanaler/). Finnish universities have introduced their own JUFO list, and Australian ERA used to rank journals until 2010.

which has a high impact factor (IF), 5,257 (IF is a measure of journal impact). Another of CONAS's publications appeared in high ranked *Journal of Ethnopharmacology* (IF=3,322). Such high-ranking publications are a great achievement to the student, a merit to the supervisors, and a credit to the university.

There again, some publications appeared in journals that are not found on any of the usual lists of academic publication venues, but on the lists of venues to avoid instead[7]. Those "predatory journals" typically have no properly identified editor or editorial board, they charge high author fees ($300 up to $2500 per article), they advertise the journal through unsolicited email, and they use unqualified reviewers or no reviewers at all. Publishing in "predatory" open-access journals is a demerit on an academic career, and it does not add favourably to the university's publication profile. Given the demonstrated potential for high-impact, high-level publications, Makerere university should promote quality-consciousness among doctoral supervisors about proper academic publication channels: Not every email, which offers to publish one's latest research findings for a fee, is from a genuinely academic journal. In the same manner, more care should be taken when submitting books for publication: for example, Lambert Academic Publishing (LAP) —with which some sub programmes have published—is not a proper academic publisher, and a number of international universities explicitly exclude LAP-published books from promotion criteria[8]. That information could have been found with a simple Google search for the publisher's name.

Optimizing outputs through multiple-paper theses

Doctoral dissertations in Makerere come in various forms. Following the tradition of medical sciences, dissertations at the college of health sciences typically take the form of a multiple-paper thesis, in which the thesis is a collection of 4-5, sometimes more, published or accepted articles and a short overview of the work. In many other fields at Makerere, theses are monographs which are stand-alone works and often contain no previously published material (although Makerere requires that a monograph thesis must be accompanied by two published refereed articles.)

Due to the many benefits of the multiple-paper thesis, there has internationally been a tendency, for several decades, to move towards the multiple-paper thesis in most fields, although the monograph arguably does serve some fields better. Multiple-paper theses offer clear milestones for progress and make progress evaluation easier. Multiple-paper theses provide better quality control due to each paper being evaluated through an impartial, double blind peer review by several anonymous reviewers.

[7]The most famous "blacklist" of questionable publishers and journals is maintained by Jeffrey Beall at http://scholarlyoa.com/

[8] See, for instance, http://www.csu.edu.au/research/performance/herdc/criteria

Multiple-paper theses benefit from continuous feedback and suggestions for improvement from a large number of anonymous, independent peer reviewers, and students start to receive that feedback very early on. Multiple-paper theses start the Ph.D. student's publication track early, they demystify the difficulty of producing the "dreaded journal article", and they nurture a culture of early and frequent publishing. There are benefits to monographs, too, such as often deeper and usually more coherent end result, facilitation of longitudinal research, experience in writing a book-length consistent academic work, and the possibility to extract parts of the thesis for later journal publication, which prepares fruitful ground for the Ph.D. graduate's publication record after the doctoral degree.

Nevertheless, if a funding programme uses the number of published journal articles and the number of dissertations as two key indicators, multiple-paper theses provide output for both key indicators. A number of interviewees referred to field-specific traditions for their preference of the monograph, but in many fields, especially in medicine, technology, and science, such tradition may not reflect the current state of affairs worldwide. There is a role and need for both formats, but the inherent benefits of the multiple-paper thesis should encourage Makerere to consider increasing adoption of the multiple-paper format for doctoral training programmes where journal articles are used as a key indicator.

3.3 COST AND EFFICIENCY: RESEARCH AND TRAINING OUTPUTS

Given the training and research outputs described above, purely in research terms the cost-efficiency of the programme was low. Overall, the 180M SEK budget yielded 20-33 doctoral graduates (depending on how they are counted), 8 master's degrees, 98(+150) publications (the latter number is from CHS, and the former from all the other sub programmes), as well as other outputs (such as infrastructure, e-databases, and training programmes). The main reasons for low efficiency (in terms of research outputs) were overly long study times and underperformance in publishing. The first reason derived chiefly from a demanding workload and insufficient study leaves, while the second reason had several underlying causes. In some cases, a new culture of publishing was only slowly taking root, and there was balancing between production-oriented ethos that relies on publishing results early and often, and a more traditional academic ethos that emphasizes comprehensive and coherent units of publication, often in form of a monograph.

Accordingly, there were great differences in terms of efficiency between sub programmes. The health sciences sub programme trained 16 Ph.D. holders and published hundreds of articles for 34,5 million SEK, and the technology sub programme trained 12 Ph.D. holders and published 38 articles for 39,7 million SEK.

In many sub programmes, the Swedish component accounted for a large proportion of the costs. For instance, in the CONAS (science) sub programme, Swedish costs accounted for 37% of the costs associated with the research programme. Of the Swedish costs, supervision costs accounted for 1,7M SEK (23% of the whole programme) and administrative costs for 835k SEK (12% of the whole programme). Table 4 presents a budget breakdown of the CONAS sub programme.

Table 4: Budget Breakdown for the Science (CONAS) Subprogram

Budget item	Cost	% Share
Ugandan costs + consumables	4,103,000 SEK	57%
Swedish costs	2,655,000 SEK	37%
Swedish subsistence grants to students	442,000 SEK	6%
Total	7,200,000 SEK	100%

But efficiency cannot be measured in terms of numbers only. Quality matters, too. The impact of low-quality research would be low, no matter how much of it was produced, so it is sometimes better to get less of high quality than more of low quality. In terms of quality of research, there are clear indications that many Makerere's programmes are able to produce research of international, highest quality standards. Interviewees regarded the Swedish input as being an important aspect in encouraging and maintaining high quality in research. Quality-consciousness was, however, not always high: The same sub programmes that published in top journals of their fields, also published in subpar journals and non-peer-reviewed, non-academic "journals".

3.4 ROLE AND IMPORTANCE OF SWEDISH PARTNERS

Swedish partners provided, first and foremost, supervision to doctoral students. Typically they were co-supervisors, but in some cases also main supervisors. Although the roles remained similar throughout the programme, and although there typically was activity throughout the sandwich programme, Swedish supervision was more active and more fruitful during the periods when Ugandan students were visiting Sweden.

The benefits were felt on both sides. On the Swedish side, there was increased understanding of a developing country perspective. For example, agricultural researchers described how they learned about agriculture and livestock production in low-income countries and Uganda specifically. Some Swedish supervisors emphasized the importance of Swedish supervisors to visit Uganda for the insights it gives into the Ugandan reality. But highly contextual research topics were also mentioned as a risk—" *the candidates come with their specific topics based in their Ugandan reality, which then has to be transferred onto the Swedish university with limited experiences of the Ugandan situation*" (professor from Sweden). Good Ph.D. candidates were on the Swedish list of benefits, and the publishing activity, albeit not as active as it could

have been, was mentioned as a benefit for Swedish partners. The programme also spun off new initiatives: For instance, a Linnæus-Palme exchange programme between Gothenburg University and Makerere arose from the collaboration in the current programme. The Swedish interviewees did not, however, consider that the programme benefitted their academic programmes at the institutional level.

Four most important aspects of the sandwich programme for doctoral students were uninterrupted time for well supervised research with no teaching and social obligations; international environment with plenty of chances for networking with peers and professors internationally; access to article databases they could not access previously; and access to laboratories and equipment that are not available at Makerere.

The importance of the sandwich programme to quality of research and doctoral degrees was emphasized by everyone involved in them. Exposure to different academic environments was highly regarded, as it is essential for new perspectives, for learning new disciplinary ways of thinking and practicing, and for gaining important insights into how to develop one's own institution in the future. From the collaboration between Uganda and Makerere, doctoral students also learned different approaches to supervision—a sort of model learning for the time when students become supervisors themselves. Such model learning is not limited to doctoral students, but also to supervisors. One Swedish professor argued that there has been an increased understanding of what it takes to produce high-quality science.

There were some cases of double ("joint", "dual"[9]) degrees in the programme. Whereas a regular degree is granted by either Makerere or a Swedish partner university (but not both), in a double degree a student is enrolled in both Makerere and a Swedish partner university, and both universities grant a degree. A student who undertakes a double degree programme has to fulfil the degree requirements for both universities. The benefits of a double degree are obvious: It provides an incentive to the institutions involved, as both can list the graduate as "their" graduate. It also provides improved quality assurance, as two universities independently agree on the quality of the work. It promotes employability and competence. In those cases where double degrees were done, experiences were good despite the increased bureaucracy and costs.

[9] Descriptions by partners were unclear about the modality of combined degrees between Ugandan and Swedish universities. But terminology on joint, dual, and double degrees is not well established. Some universities refer to "one diploma, two stamps" model as joint degree and to "two diplomas, two stamps" model as a double degree. Sometimes the terms are used interchangeably. Also legal and ethical issues concerning double degrees are debatable in those cases where the same data set is used for both degrees: How many doctoral degrees is one allowed to collect using the same research data?

Academic incentives vs. contractual obligations

Previous evaluation of the Swedish-Ugandan research collaboration pointed out an issue with unclear roles among collaborating individuals and institutions both in Sweden and Uganda. For the current programme, those roles were clarified in the programme memo, in Sida's collaboration guidelines[10] and in a Terms of Reference negotiated between Ugandan and Swedish supervisors, but as all academic partnerships are unique, the guidelines and recommendations were not always followed, some participants found the roles to be still unclear, and some participants thought that Swedish supervisors played the most important roles. Ambiguities and issues remained throughout this programme, which may not reflect flaws in programme design as much as it reflects the nature of academic partnerships and how successful research groups function.

In the academic structures of Ugandan and Swedish universities, professors have considerable freedom and independence, and in many cases incentives work vastly better than regulation and control do. Academic incentives include, for instance, joint publications, main supervision of doctoral students, access to otherwise hard to collect data, and opportunities to attend conferences. Those incentives benefit researchers' careers. Other incentives include, for instance, workload reallocation, increased research budget, and conference travel budget. For instance, Ugandan supervisors, who are bound to Makerere's institutional policies, have difficulties taking on doctoral student supervision, because each doctoral student increases their workload, and reallocation of time from other duties is rare.

It is not certain whether more binding agreements would offer a solution to the above mentioned challenges with supervision. In the academic world, well functioning research groups divide roles and responsibilities in a dynamic, goal-oriented way; not in a static, contractual way. In the academic culture, high-level collaboration principles may work better than low-level duties and contractually binding agreements that are only referred to when problems arise. Although memoranda of understanding and signed contracts establish institutional commitments, academic partnerships are still fundamentally human relationships, because collaboration boils down to the human level, to the interests and incentives of the key participants, and to the benefits that collaboration gives to partners. There was also critique of the future plans of Ugandan-Swedish collaboration and whether it responds to the most acute needs of Makerere: One Swedish supervisor argued that focus should be on improving the supervision incentives and supervision culture at Makerere instead of going for cross-disciplinary teams. If the bottlenecks are supervisor workload, poor incentives for

[10] Appendix 11 of 18 January 2010 Assessment memo: "*Role of Swedish and other Ugandan publicuniversities*." Sida Guidelines, 2008 Edition: "*Support to national research and development*"

supervision, and lack of research time for students, little can be gained from mixing up teams from different fields. Another Swedish supervisor disagreed, and argued that well-functioning teams could indeed improve efficiency and effectiveness of doctoral training.

In those cases where collaboration does not work as intended, quality supervision may gain little by way of formal rules and requirements. What is more, too detailed prescription of supervisors' duties may go too far on both sides—take, for instance, Sida guidelines for support to national research development (2008, p.38) and the ToR for supervisors in this programme (§12), which state that the responsibilities of Swedish supervisors—who are typically professors—include "*practical matters including arrangement of accommodation*" for incoming students. Swedish as well as non-Swedish professors in Swedish universities are hired for their academic expertise, and house-hunting is clearly out of their field of expertise.

Increased focus on clearly stated and attractive incentive structures, creating a research culture with mutual benefits to everyone involved, and improved early identification of non-functioning collaboration are key issues in improving supervision. Although clearly stated roles and responsibilities are important for division of non-attractive and non-rewarding but necessary tasks, development of rewarding and fair incentive structures is equally important.

3.5 PARTNERSHIPS WITH PUBLIC UNIVERSITIES

The programme planned for twenty staff members from Kyambogo, Busitema, Gulu, and Mbarara to attend doctoral training at MaK. The main objectives were met to some, but not to a sufficient extent. Courses and workshops run by Makerere were considered, by interviewees, to be of high quality, but their timing was sometimes not well suited for the partners. A number of outputs were missing: Of the four ICT policy and strategy documents that DICTS was mandated to develop for partner universities, only one could be presented by DICTS.

Regarding doctoral training, interviewees listed many reasons for the shortcomings. On the one hand, many issues originated from partner universities—for instance, students' personal issues and life choices forced them to stop mid-way the training, acute staff shortage in partner universities did not allow sufficient research time, and university coordinators had no knowledge of the situation of a large number of students. On the other hand, the interviewees reported lack of transparency, excessive bureau-

cracy, and poorly motivated supervisors on the Makerere side. There were communication gaps and lack of concentrated coordination efforts on both sides.

The programme January 2010 assessment memo explicitly stated that "*co-supervision by Swedish supervisors and visits to Swedish collaborating universities will also be possible*" for students from the public universities (Appendix 11, B[11]). In this evaluation, that modality was found to apply only to Makerere staff members, but not to the staff members of the other partner universities. While Makerere's own staff members enjoy the benefits of the sandwich programme, that option was not made available for the partner universities.

The partner universities have their own challenges: a dire shortage of staff members with doctoral degrees and research experience, limited capacity for management of large research programmes, and sometimes lacking culture of timely and efficient communication. Their training needs, however, are at least equally urgent as Makerere's.

The relationships between Makerere and the partner universities are characterized by the dominant position of Makerere in the country, and by the clearly expressed confidence of many Makerere employees about the superiority of MaK over the other partner universities. The widespread "big sister/brother" and "children" rhetoric suggests that there is yet no intention to treat universities as equal partners, although a senior staff member at MaK announced, in a round-table meeting that Makerere, wishes to treat the other universities benevolently: "We have no ill feelings about our children that we have given birth to and we have nurtured."

The relationship is not a healthy and equal partnership—at least it is not perceived as one by the partner universities: *"We have not been partners, but beneficiaries"* (senior officer of a partner university). The partners *are "informed but not involved"* (ibid.). The partnership does not resemble a collaborative one, but a contractual one: partners feel that they receive from Makerere an offer that they can take or leave but not negotiate. There are also programmatic issues: As long as partner universities have little or no power to influence the programme document, their own needs, specialties, and focal areas—no matter how important for national development or the development of partner universities—are not involved in the programme document.

At a broader level, one can ask whether supporting an already dominant and well developed university is the best tool for supporting national development. If the aim is

[11]Appendix 11 of 18 January 2010 Assessment memo: "*Role of Swedish and other Ugandan public universities.*"

to conduct research of high quality, there is no doubt that Makerere is the only Ugandan university able to do that on a large scale. But if the aim is to train researchers, that task can equally well take place in the other public universities. And if the aim is to develop the country's university sector to better respond to the varying research and labour needs of the country, supporting the development of a diverse and pluralistic university sector may better serve that aim. In other countries, specialized universities are often found at the top of ranking lists: take, for example, M.I.T. in the U.S., Karolinska Institute in Sweden, or ETH Zürich in Switzerland. One could also consider it problematic that Makerere controls the country's research portfolio, that support to Makerere widens the gap between the capital and the rest of the country, that it might not be desirable to have an extremely centralized university sector with no real competition, and that the point of diminishing returns may already have been reached at Makerere.

3.6 LIBRARY

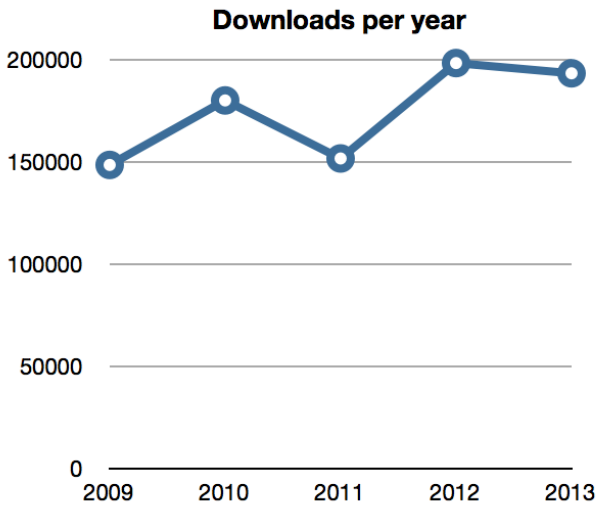
In addition to capacity development, mentioned above, a part of the 8 million SEK support to Makerere library was intended for acquisition of digitization equipment and for various ICT-related service development activities. Digitization activities have been supported earlier by Norad (2004–2006), with limited success, as well as by Carnegie (2008–2011).[12] The digitization project aimed at digitizing 5000 dissertations and other Makerere publications and making them available online. Interviewees reported that due to a very slow procurement process, it took the library three years to get the necessary equipment. The interviewees reported that the process was first stopped at a secretary's desk, and then mired by the procurement office's call for tenders, tender evaluation and awarding, contracts committee, government solicitor general, supplier side, and finally customs. Regardless, 2600 publications were digitized, and the library now has the necessary equipment and human capacity to continue the digitization process with no further support.

ICT integration happened gradually, but the library has adopted a new library system and introduced it in use. E-resources, such as IEEEXplore and SpringerLink, were subscribed to, but they turned out to be too expensive for sustained subscription. The target for the library's number of downloaded articles was set to 2 000 000 articles downloaded by June 2014, but due to problems with dynamic IP address handling, the system fails to record many types of non-local and local data requests. Despite

[12]Sida (2010) *Assessment of Application from Makerere University: Continued Bilateral Research Collaboration with Uganda*. February 18, 2010.

the difficulties in properly recording article downloads, some 723 000 article downloads were recorded over the period of 2010–June 2014.

Figure 4: Articles Downloaded Per Year From E-Resources



The downloading of articles was hindered by the slow Internet connection, which in the afternoons, typically between 13:00 and 17:00, slows down to a crawl, but library customers were generally very satisfied with the improvement of library services. Testimonials from library users were encouraging: One doctoral student noted, "*For the remote learners e-resources are irreplaceable for they enable them to have a library anytime, anywhere for their studies and research*", and a teaching assistant regretted that after IEEEXplore was no longer available, students and graduate students needed to cope with slow, manual article requests.

3.7 CROSS CUTTING COURSES

After the Sida programme started, Makerere's doctoral training has seen a number of minor and major changes. One of the more fundamental changes is the gradual shift from a research-only doctoral degree to a combination of course work and research. Well aligned with this fundamental change in thinking about doctoral training, the Directorate of Research and Graduate Studies introduced a number of crosscutting courses on generic topics that are useful for all doctoral students regardless of their field. DRGT received 3.6M SEK for development and implementation of such courses.

The vision as such is commendable for its emphasis on elevating students' thinking from specifics to generic questions concerning all disciplines. The course selection introduced by DRGT is well chosen, as it contains courses of generic utility and lasting academic value—"thinking tools" for any academician. The well implemented courses on the philosophy of science, for example, demonstrate the importance of

philosophy for non-philosophers, too: Students and supervisors reported greatly increased academic self confidence, improved disciplinary self-understanding, and readiness for interdisciplinary research.
The implementation of crosscutting courses has been a success beyond doubt, and the budget used for designing and implementing them was relatively low (3.6M SEK). The courses received praise across the board. Doctoral students considered the courses extremely useful: one participant in the philosophy of methods course exclaimed, "*Now we think outside the box*". Supervisors have not only been happy to see their students develop ("*These courses make students more independent, they become mentors*"), but they also want to take those courses themselves ("*My student came out knowing much more than I do*").

A curriculum analysis of two crosscutting courses revealed very well planned courses. Intended learning outcomes were clearly laid out and deliverables were challenging. Pedagogy was a combination of problem-based learning and other constructivist strategies. The syllabi focused on clear and coherent progression towards the intended learning outcomes, with focus on knowledge construction, and the course facilitators were recognized experts in their respective fields.

Table 5: Participants in Cross-Cutting Courses in 2010–2014

Course name	Applicants	Participants
Philosophy of methods	196	139
Research methodologies	124	85
Advanced gender research methods	129	90
Statistics and computer applications	154	50
Information competence and management	245	108
Scholarly writing and communications skills	71	51
Genes and genomes	35	20
Total	**954**	**543**

Unsurprisingly, the courses have turned out to be a great success among students and supervisors, with far fewer available seats than applicants. The courses offer students important windows to the academic world and abstract thinking, and they provide students mental tools serviceable throughout their academic careers. The only negative aspect of the courses, according to the interviewees, has been their mode of delivery: They are given as short, intensive courses, which does not suit all participants well.

The crosscutting courses have demonstrated their utility and usefulness, and their further development should be supported by all reasonable means. The topics of the cross-cutting courses—methodological skills, scholarly communication, information management, conceptualization, and abstraction skills—are also important for master's students and supervisors alike. It would be beneficial for the university to ex-

tend the courses for broader populations also on master's level and on supervisor level, or rollout the courses as e-learning courses.

4 Institutional Capacity

4.1 INSTITUTIONAL STRENGTHENING FOR RESEARCH

The University Strategic Plan 2008/09- 2018/19 called for a more robust and versatile institutional set up and effective change management that would have a broader scope to embrace research, administrative and financial reforms in addition to the academic processes. This realisation triggered creation of the "University Research, Academic, Administrative and Financial Reforms (URAFR) Committee." The Sida research programme was one of the sources of support that funded activities of the URAFR Committee; the others being: Government of Norway, European Developing Countries Clinical Trials Programme (EDCTP) and Makerere University from the Internally Generated funds.

Key outputs from this process included:

- Gazetting of the University College Statute in December 2011. Consequently, Makerere University now operates a collegiate mode of governance with nine constituent colleges and one school, operating as semi-autonomous units of the University

- The URAFR Committee enabled the University to identify processes and policies that affect academic delivery; mainly teaching, learning and research; as well as governance, finance and administration. As a result, approximately 150 new or redesigned processes (Finance and Administration 90, Research 40 and Teaching and Learning 20) were documented in the institution's Organisational Manual and the Research Manual launched in 2011.

The Change Management Committee (CMC) adopted a disposition of integrating reforms in the ongoing operations and strategies of the University, rather than creating parallel interventions. In line with the innovation of *leveraging MaK internal capacity to handle its challenges,* CMC contracted external consultants in circumstances where optimal value was to be relinquished. The university has mainstreamed change management and the Directorate of Quality Assurance is charged with the responsibility of ensuring continuity and sustainability of the Continuous Change Management Phase. Sida committed 2 million SEK from the current programme to kick start implementation of the administrative reforms during the extension period.

Support to the Makerere reform process has been vital and has triggered fundamental changes to MaK, including shortened examination periods, decentralized decision-making procedures, strengthened financial management, and improved academic de-

livery. Key informants noted that the university systems have improved compared to the situation before 2010, especially financial procedures.

Institutional support to gender mainstreaming has been instrumental for MaK's achievement to be a model university in gender issues in East Africa. During this phase the Gender Mainstreaming Directorate has focused on reviewing policies to mainstream gender; undertaking capacity strengthening events geared towards improving women's participation in leadership at Makerere University; supporting female staff from academia and administration to acquire graduate qualifications at masters (10) and PhD (5) level; and supporting the four partner public universities of Gulu, Mbarara, Busitema and Kyambogo universities to embark on a gender mainstreaming process.

Key results include:

- Mainstreaming of gender in the new/redesigned processes and policies formulated under the University Research, Administrative and Financial Reforms (URAFR).

- Making gender a central factor in the process of implementing the URAFR reforms through the Change Management Committee, e.g. mainstreaming of gender in the Human Resource Manual.

- Strengthening capacity of female staff members to participate in university leadership, through organising and supporting their participation in continuous capacity development events notably mentoring workshops[13] and participation in conferences. By the time of this evaluation, there was 16 (22%) female staff in leadership (3 Deputy principals, 3 Directors, 5 Deans, and 5 council members) out of 74 leaders. The finding is below the programme target of 20 female staff in leadership. The age limit and number of female staff was noted to present challenges in getting enough applicants. Likewise, inadequate support systems (lack of quality day care centres, lack of support for women to travel with their young babies to conferences etc.) were noted as barriers for female participation in PhD training, and research.

- Production of situation analysis reports and draft gender policies for the partner universities. Discussions with representatives of the four partner universities revealed that Gulu and Busitema Universities' Gender Polices were in place, but waiting approval by the respective university organs, while in Mbarara the process is yet to produce a draft for subsequent submission to the university governance organs. GMD did not embark on pro-

[13] Mentoring workshops and production of a guide were supported by both the Carnegie Corporation of New York and Sida.

duction of the Gender Policy and Gender Plan of Action for Kyambogo University as parallel intervention to produce the same outputs was being implemented by Kyambogo University with support from the Austrian Development Cooperation (APPEAR project). However, there were delays in conducting dissemination workshops in the partner universities with these activities taking place in April 2014. Consequently by time of the evaluation GMD had not yet launched or published the situation analysis, and gender policies and plans of action.

4.2 RESEARCH PROCESSES/PROCEDURES

Institutional mechanisms for encouraging and facilitating research

In its Strategic Plan (2008/09 -2018/19), MaK has taken a strategic decision to become a research driven university where research and learning/teaching are mutually re-enforcing. Through this strategic plan the university recognises research and innovations as one of its core functions:

- The Makerere Research and Innovations Policy approved in 2008 is geared towards strengthening the research capacity and increase the university's contribution to the world of knowledge and innovation. The policy focuses on: Creating an enabling environment for research and innovations, strengthening research management and coordination, improving research and publications culture, providing and supporting platforms for dissemination of research outputs, promoting ethical conduct of research in the University and improving funding for research and innovations and gender- responsiveness of the University through research innovations.

- The Intellectual Property Management Policy approved in March 2008 is geared at assisting researchers, research managers and the university in ensuring that they have access to best practices for the identification, protection, and management of intellectual property so as to maximise the benefits and returns from public investment in research. In this policy, the university affirms its commitment to provide a conducive environment that supports innovation, knowledge creation and technology transfer in line with the national development agenda. The university also commits its self to supporting the commercialisation of products of research and innovation for the benefit of society, the inventor and the institution.

- Human Resource Development Policy (2009): This policy among others emphasises that, while on sabbatical leave, an employee should focus on advancing frontiers of knowledge though research i.e. processing of research data and publishing the results in form of research involvement and benefit to both the University and the employee.

- Academic staff appointment letters and or contracts require that in addition to teaching and outreach/community services, each academic staff should devote 20% of their time to research. Discussions with staff reveal that flexibility in defining one's own working hours encourages and facilitates research. It

should, however, be noted that the requirement for academic staff to devote 20% of their time is not strictly adhered to due to the human resource constraints which lead to work overload in terms of staff teaching hours. This is more pronounced in some of the colleges notably humanities. DRGT is in the process of collecting data on the entire research portfolio in the university to provide evidence to guide decisions on how to enforce the requirement.

- Career progression is the key incentive for staff to engage in research. The University Policy on Appointments and Promotions sets a Ph.D. as requirement for a teaching position at the level of Lecturer and above[14]. Key informant discussions revealed that it is also a requirement that for one to graduate with a Ph.D. in Makerere, s/he must have produced two manuscripts accepted in peer-reviewed journals. To progress to Senior lecturer one has to produce three papers in referred journals, from senior lecturer to Associate professor you must have produced five papers in referred journals, and to become a professor you must have supervised at least three Ph.D.s who have completed, produced eight papers and attracted research funds to the tune of USD 200000.

- The postdoctoral research grants were introduced as a mechanism to enhance retention and research productivity. However, there is no time reduction for the staff to focus on research. Consequently, the Ph.D. students and Post doctoral researchers continue to teach and engage in all other academic and administrative responsibilities in addition to undertaking the research. Key informants noted that it would require the university to increase the number of staff so as to reduce teaching workload and increase focus on research. It is vital to increase support for postdoctoral research so as to fully exploit productivity/make best use of the established Ph.D. research capacity. The postdoctoral research grants will help to motivate the staff and maintain research momentum so as to have the ripple effect of the highly qualified manpower.

- Improvements in Internet access, library and some laboratories were also noted as measures that have facilitated research in the university.

- There is a deliberate move to establish research positions in colleges. The Human Resource Manual caters for the research positions. Likewise, the research manual calls for establishment of research institutes in the colleges with posts of research chairs/fellows to lead research in specific thematic areas. However, with the exception of Makerere Institute of Social Research (MISR) research positions are yet to be effected in any other unit in the university.

[14] Makerere University Self Assessment Report October 2013, page 36

Processes for selection graduate students

Processes for selection of masters and Ph.D. students to benefit from the Sida programme vary depending on the unit. Students on the programme under DRGT and GMD are selected through an open and competitive process with inbuilt mechanisms to ensure quality. Within the colleges, scholarship beneficiaries are selected based on: i) participation in development of the unit proposal submitted to Sida, and ii) interest and availability to purse research in the focus areas in the proposal. In either case the candidates have to meet the eligibility criteria.

Student selection of research topics and support provided by the university

The research topics are by and large selected by the students/researchers. The students/post doc researchers have the freedom to think and make a case for their research. This notwithstanding the approval process in case of students and selection process in case of post docs scrutinises the proposed research topic, objectives and expected deliverables to ensure that they are well aligned with the national priorities and the MaK research agenda. The graduate student/post doc researcher is put to task to justify how the research is aligned to the national development priorities. Discussions with the post doc researchers revealed that "If you cannot find a link with the national development priorities, you cannot really win the post doctoral grants" hence they endeavour to fit their studies to the national development plan.

Processes for planning and monitoring of research proposals before submission for funding

Processes for planning and monitoring of research proposals vary depending on whether it is a student research proposal or a proposal by a senior researcher/team/unit to a prospective funding agency. The Mak research manual describes the process of research management to entail the sub-processes of research grants mobilization, identification of research teams, awarding and reporting of grants. These sub-processes are expected to lead to increased quality and (quantity) of research outputs from the University. The process of research grants mobilization from donors or DRGT in case of post doctoral research grants is a competitive one engaged in by the researcher/team /college, coordinated through/by the Research Grants Unit. A researcher/team prepares a research proposal in response to invitation to submit a proposal or response to a Call for Proposals. First, the proposal is sent to the school research committee which peer reviews it and provides inputs. After addressing the comments, the researcher/team sends the proposal to the dean of the school or principal of the college who have to endorse it before it is submitted to DRGT or to the donor. Discussions with the postdoctoral researchers validated the above process. The process is open and has inbuilt mechanisms to ensure quality.

In case of master's student research proposal, the student identifies a topic and writes a synopsis which s/he submits to the school. When the title and corresponding synopsis is approved, the school assigns the student a supervisor who supports them to produce a proposal. In some colleges, the student proposal is peer reviewed during presentations with fellow students. Once the supervisor ascents to the proposal, the

student submits it to the coordinator of the College Higher Degrees Committee/vetting committee, the student is called to defend the proposal and if accepted the committee will send the proposal to DRGT with minutes from the meeting during which the student defended the proposal.

On the other hand, each Ph.D. student is required to develop a concept note and submit it to DRGT in order to get provisional admission. Then, the student is given one year to work with a team of at least two supervisors to develop a full research proposal until they are satisfied with it. Then the student submits it to the college higher degrees committee, which reviews the proposal. A day is fixed and the student is invited to defend the proposal in a meeting with members of the committee. The committee may approve the proposal with comments for revision which the student has to address before submitting it to DRGT to get full admission.

Processes for requisition of research funds and procurement of materials

The research manual stipulates the general processes followed in requisition of funds. In case of the Sida programme, requisitions and financial disbursements go through the entire university process which has inbuilt checks and balances to ensure transparency and accountability. Researchers noted that the financial disbursement systems were quite fast provided one has prepared and provided all the necessary supporting documents.

Procurement of research materials is triggered by the researcher submitting an application for materials. Procurement of research materials and books is conducted through the Procurement Committee at College level (for purchases below UGX 50 million) and at the Central Procurement Office for procurements above this limit following the PPDA guidelines. Procurement delays were noted and this impaired timely undertaking of research activities and consequently reduced effectiveness.

Processes for follow-up of graduate students

After approval of the research proposal and receipt of funds, the student researcher embarks on implementing the research activities. Discussions with masters and Ph.D. students as well as supervisors revealed that during data collection, supervisors monitor at regular intervals, they join in the field at the beginning of field work to see how the students collect the data and guide them. Even during lab work, they make impromptu visits to see what the student is doing, seek explanation from the student and give on spot advice. The same is done when a student goes to Sweden.

The supervisors form a communication ring around the student work, they share e-mails and Skype calls and the student is involved in all this communication unless the supervisors have something they want to share only among themselves. Every six-month the student has to make an oral presentation on progress to the supervisor before preparation of progress reports stipulating activities done, achievements, challenges met and required remedial actions.

Graduate seminars are also used as a forum for students to present their research work to and get feedback from fellow students and lectures in the college or any other members of the university/public who may be in attendance (College of Business and Management, CAES, COVAB).

After two manuscripts have been accepted in peer reviewed journals, the student is advised to draft his/her thesis. The university encourages the student to process a letter of intent to submit a thesis at least six months from date of submitting the thesis. The letter of intent is to give ample time to DRGT to liaise with the schools to identify two internal and one external examiners to whom the student thesis will be subsequently sent for examination and submit a report. DRGT and the school also identify an opponent who attends the student's defence. It often takes 3-6months after submission for the defence to take place. A day is chosen and advertised in the entire university by webmail and posters. The students make a presentation, discuss with the discussant/opponent and responds to questions from the panellists and other members in the audience.

If performance is found to be satisfactory, the student is given back the copies from the two internal examiners and external examiner as well as the comments from the assessment panel to revise the thesis and submit a final copy to the DRGT.

Efforts taken to promote the application of research results in society

The university strategic plan 2008/09-2018/19 recognises the importance of research and innovation for knowledge generation and technology transfer geared towards national development. The research and innovation policy and the Intellectual Property Management policy further re-affirm the universities' commitment to enhance knowledge transfer and support commercialization of products of research and innovation for the benefit of society, the individual and institution.

To enhance dissemination and commercialization of research products and innovations, the university created the intellectual property and knowledge transfer unit in the division of research, innovations and knowledge transfer partnerships under DRGT. However, the unit is new and not yet staffed. Limited staff capacity notwithstanding, DRGT has spearheaded development of a research and innovation dissemination communication strategy. MaK has continously enriched the University curricula by providing experimental learning to both staff and students and at the same time generating community applicable research outputs[15]. Efforts include:

[15]Makerere University Annual Report 2013,

- Organising University level dissemination conferences, of which three have been held to date. The Sida annual science day organised every year with the venue alternating in the various beneficiary colleges.
- College level annual dissemination conferences where researchers make presentations and share finds of their research work.
- DRGT is encouraging researchers to produce popular summaries and policy briefs, though this is still weak
- Pairing/twinning of politicians notably Members of Parliament with researchers so that politicians better understand the research results and possibility advocate for uptake as well as more funding for research.
- Makerere staff participate in exhibitions at national and regional level.
- Breakfast meetings with Members of Parliament, government ministries and other stakeholders to share findings
- College based knowledge transfer initiatives including dissemination activities in project sites, public dialogues, talk shows, open days and student outreach activities.

Key informant feedback revealed that by and large, up scaling and uptake of research results outside project sites is still weak. Research proposals include a dissemination plan and the researchers conduct dissemination workshops, but these are limited to the project sites. Consequently, more efforts are needed to enhance uptake of research outputs. Opportunities lie in institutionalising the public dialogues, inaugural lectures, policy briefs and popular versions from the Ph.D. and postdoctoral research, breakfast meetings with relevant government ministries, and departments as well as politicians and other stakeholders.

Although the University is encouraging public private linkages, commercialization of research is still weak. Currently, DRGT has no staff to support this function. There is a need to support commercialization of promising outputs of research and innovations in a sustainable manner. The Sida programme should support the university to build and strengthen systems for incubation, and testing of the research outputs. Partnerships with private sector should clarify the issue of intellectual property rights from the outset. The programme should place emphasis on supporting the researchers to get patents so as to protect their Intellectual property rights.

Integration and ownership of the Sida supported research programme

The research programme is fully integrated and owned by Makerere University. It was noted that Sida lets Uganda, through MaK, decide on priority areas. The support addresses areas already highlighted as priorities in the strategic plan. The thematic approach was applauded for having provided opportunity for the units to form teams to respond to real problems affecting society.

The above notwithstanding, it was noted that good proposals come from where there is capacity. This may lead to some areas being neglected. Those who work in areas that do not get funded never get promoted because they do not have the resources for research which is a prerequisite to get publications.

4.3 RESEARCH MANAGEMENT

Research management structures

Programme interventions were expected to result in improved research management and coordination. The Research and Innovations Policy 2008 and the Research Manual produced in 2011 provide clear organisational structures for management and coordination of research and graduate training. At inception of the research and innovations policy, the then School of Graduate Studies (SGS) was given the mandate to carry out this function. After the institution-wide reforms that took place in 2010, the status of the Graduate School was changed and the school became the Directorate of Research and Graduate Training (DRGT) and the structure was re-organised to efficiently and effectively facilitate the coordination of research and innovations.
The Board of Research and Graduate Training provides policy guidance with respect to research and graduate training. This has been streamlined compared to the situation before the reforms when policy guidance under the School of Graduate Studies was provided through two boards – Board of Research and Publications and the Board of Graduate Studies. The Directorate of Research and Graduate Training (DRGT) is the secretariat to the Board and the one stop center for coordinating the research and innovations function. All institutional grants are coordinated by the Directorate. DRGT operates through two divisions, namely: i) Division of research, innovations and knowledge transfer partnerships and ii) Division of graduate training coordination.

The division of research, innovations and knowledge transfer partnerships comprises of three units namely, research grants unit, intellectual property and knowledge transfer unit and the publications unit.

A recent task force on Job Evaluation and Reorganization of Staff Structures of Makerere University has recommended that DRGT be further restructured and elevate the position of the Directorate to that of a Deputy Vice-Chancellor in charge of Research and Innovations.

Management and coordination of the Swedish supported research programme

- **Effectiveness and efficiency in coordination**

Since inception, the Sida research programme support has been coordinated by the DRGT. Discussions with researchers and students in the units suggest that there has been effective coordination between DRGT, the units, and researchers/students. There are no delays, everything works smoothly between Sida and Makerere, and there are no delays between DRGT, the university bursar and units. Sida does release funds to DRGT twice a year. This has enabled timely disbursement of funds to the units. Units are happy with the financial management process which they note to be quite fast and efficient. A former Ph.D. student noted that *"coordination was very smooth and finance management was efficient at DRGT".*

Having the research funds controlled at DRGT and not at the college or in the pool at the university basket ensures that funds are used for the intended purpose. DRGT

facilitates access to research permits by providing introductory letters to the Uganda National Council of Science and Technology to approve the research permits for the researcher.

The above notwithstanding, delays in communication, ad hoc meetings, as well as instances of communication from DRGT bypassing the college leadership, and limited involvement of leadership in the partner public universities were cited as drawbacks. Procurement process was noted to lead to long time lags between requisition and delivery of research materials and equipment. This creates a bottleneck and impairs timely implementation of activities. Inefficiencies in the procurement process were attributed to national procurement regulations. The situation is expected to improve in the subsequent phase, as the national procurement guidelines were recently revised introducing more flexibility. Makerere has also updated its procurement manual in line with the revised national guidelines.

Discussions with units and DRGT revealed that funds for activities budgeted in a given financial year are not carried over to the next year in the event that they were not used and have to revert back to the donor at end of the fiscal year. However, feedback from the Embassy revealed that the researchers do 'not lose' funding because they do not use it, rather funds are reallocated to another user – which gives flexibility. The researcher that did not use budgeted funds in the first place will get the funding back when he/she has the activity planned and is ready to use the funding.

- **Decision making**

The programme management structures have allowed actions and decisions to be taken at the relevant levels. The project teams implement research activities, sub-programme coordinators at the unit level monitor and coordinate the projects in the unit. Project Implementation Committee (PIC) enables its members to discuss, share lessons and learn from other units, DRGT for overall coordination and guidance, Programme Steering Committee (PSC) and Top University Management provides oversight. The PSC meets three times a year while the PIC meets once every quarter.

The Project Steering Committee whose chairperson and deputy are not from the university was noted to have been instrumental in guiding decisions on reallocation of funds, providing vital advice during discussions of new ideas, liaising with the Embassy to iron out issues, and clarifying roles of various university organs in management of the programme. It deliberates on whether programme implementation is moving as planned, are finances used well, need for reallocations to enable research to move at faster pace. Units originate the request for reallocation, which it submits to Director DRGT who liaises with the accountant for guidance. Then the accountant presents the requests to the Steering Committee for consideration. It was noted that reallocations have been common. Reallocations above 30% of the unit budget lines have to be approved by the Embassy.

- **Transparency and accountability**

The university uses elaborate and transparent processes for disbursement of funds and procurement of research materials. Units/researchers have to account for the funds before getting the subsequent releases. Requisition and accountability reports are submitted through the immediate supervisor to the DRGT Director, and the subsequent review and approval process involves the DRGT Director and accountant, internal audit unit, and the university bursar before a cheque is issued to the respective unit/researcher. In case of research equipment the assets are engraved prior to passing them on to the units and the units maintain a physical assets register that also tracks the officer responsible for the equipment.

- **Reporting and documentation**

There is variation in the targets regarding numbers of students to be trained at masters and Ph.D. levels depending on the document one reads. Reporting procedure under the programme is noted to be very demanding. The reports from lower levels for instance, student reports are presented as standalone reports put together into the unit report and subsequently the standalone unit reports into the overall programme. The annual programme targets are split into sub programme activity plans and are reported on in each sub programme summary, but this does not easily convey progress towards attainment of the expected results of the overall programme.

Although the report template requires the implementers to describe the achievement of the expected results as well as any unexpected results, spin-off effects and use of analytical capacity/work for the private and public sector and civil society; the reports do not adequately track and capture changes triggered by the interventions.

Incorporation of experiences from previous phases of the programme

Previously the Steering Committee comprised of only Makerere staff including the same people who were also the implementers. The ineffective PSC was highlighted as a weakness during evaluation of phase II and the programme acted by changing its composition to eliminate conflicts of interest. Now, the chairperson and deputy chairperson of the committee have to be external people. There was also conflict of interest when the Vice Chancellor (VC) who appointed the Steering Committee was a member of the committee. This has been changed such that now the VC appoints the PSC, while the Deputy Vice Chancellor (DVC) is a member. Previously no proof of agreement by the partners was required before the unit could submit work plans and reports. Now DRGT requires that the documents are signed by the representative of the collaborating entities.

Monitoring of discrepancies between activity plans and annual reports

DRGT does approve the revised work plans, budgets and expenditures after the assessment and funding decision. Annual plans and budgets are prepared by the units and reviewed by DRGT before submission to the embassy. During the annual review, each sub coordinator is given two hours to present the annual report and work plan to DRGT. They discuss and ask questions related to the report and work plans. Like-

wise, the reports submitted to DRGT are reviewed by the project administrator, who communicates to the concerned parties through email and phone in case of issues of clarification. At times, if the issue can not be resolved through email and phone communication, the person is invited to come to DRGT to discuss and provide clarifications to resolve the discrepancies. DRGT does not have the capacity to physically visit all the units.

There are mixed results with regards to the impact of the programme on research management capacity. In the first instance, skills and rigor have gone up. For instance, the College of Health Sciences has established research and ethics committees to guide the research on human subjects. Four such committees have been approved by the Uganda National Council of Science and Technology (UNCST). The students are followed and make presentations pre defence and during defence for the proposal and thesis. The post doctoral researchers are required to identify a senior professor to work with them for purposes of mentoring.

Resource-wise, however, capacity is going down because coordinating the Sida programme place demands in terms of time and effort while no extra staff and incentives are provided for. The staffing levels in DRGT are not commensurable with the current workload. Although the MaK policy stipulates that projects should provide 15% overheads Sida only pays 6% which is proportionately distributed to all the units depending on the budget.

Internalisation and use of the Result Based Management tool
Sida has financed four trainings on RBM for MaK staff. Such training is noted to have enabled the DRGT and the sub unit coordinators to acquire knowledge, consequently reviewing and improving their result statements to make them specific, measurable, attributable, realistic and time bound (SMART). Key informants noted that the RBM tool helped them to clarify the link between activities and results. However, trying to bring on board changes in the original planning framework developed in 2010 caused a lot of discomfort. It would have been more effective if the RBM training was done early in the programme at the time of developing the proposal or during the inception phase when revisions could be brought on board. The first two training workshops on RBM prioritised coordinators who were expected to then train students. This did not work well hence students were brought on board during the recent trainings in May 2014. Students should have been involved right from the start of the RBM training programme as they are key team members in implementation and reporting.

4.4 RESEARCH INFRASTRUCTURE

Change in infrastructure
The programme set out to improve the environment for research through provision of quality library and ICT resources, laboratory infrastructure, and support to Iganga/Mayuge Demographic Surveillance Site (DSS). Findings reveal that the Sida sup-

port has made significant contributions to improvement of infrastructure that supports research. In addition to funding research through masters and Ph.D. training as well as Post doc research efforts directly, marked investment went into the environment in support of research namely ICT infrastructure, library services, and the GIS laboratory.

With respect to ICT infrastructure, there has been increased capacity notably servers which have improved network services, increased storage space for email, web pages, and a campus-wide VoIP system. Users can now access the WIFI network anywhere on campus. The bandwidth was noted to have been a limitation, but the university has taken up the strategy of using the VoIP system so as to improve connectivity and bandwidth. This is expected to reduce costs and the ICT service.
The library acquired a modern document scanner in 2013 although its procurement took nearly three years. A total of 2500 items have been scanned during this period. Digitization of material during the earlier phases coupled with enrichment of information resources, and integration of ICT in library functions have made it possible for researchers to access the 'Library without walls' due to easier access of the net to quantity and quality materials and linking with collaborating institutions' libraries, for example Ph.D. students' access to Gothenburg Library.

The GIS laboratory has acquired minor GIS equipment including computers, printers, and scanner. The staff have also developed a cross cutting course on GIS. The DSS acquired 10 Personal Digital Assistants (PDA) and 30 note book computers with Sida support. The equipment has higher speed improving execution of data management. The support has enabled the site to access relatively fast and reliable internet connection. Sida support has enabled the DSS to pay for rent, undertake routine demographic surveillance data collection and management. It also received a donation of a generator, motorcycle, vehicle from the IDA after close of the TB study. However, they have had challenges with the data management software.

Sida support has enabled improvements in unit based research infrastructure. For instance, over the years Social Sciences has established three computer labs and a kiosk following the purchase of 70 desk computers with support from Sida. The crosscutting laboratory and microbiology lab in the College of Health Sciences acquired new equipment. Likewise, COVAB acquired equipment for storage of samples, pipettes, and other small equipment, dry air incubator and microwave directly as a result of Sida support, somatic cell counter and an ultrasound machine which were acquired using funds from other sources but their acquisition triggered by need to address analytical issues as a result of the Sida project.

Utilisation of the established infrastructure
Facilities are available to the university community and others from the public. Internet is accessible to all users at campus and the server (email/web) uptime is as high as possible (24hr/day with short pauses for updates). The electronic library databases are available to anyone within the local area network. The GIS lab is accessible to

M.Sc.Geo Information Science and Technology for their courses, other individual students on a first come first serve basis while College/schools book for particular times to conduct practicals. The lab has also been used by students from other universities, as well as staff of local and international NGOs who come for short courses. The team that has been undertaking research on multiplication of the edible grasshopper "Nsenene" have used the lab at COVAB to hatch its eggs. When this team gets a break through, it will greatly impact the livelihoods of communities that engage in trading this insect.

The DSS has been used by research teams from the various colleges in Makerere, as well as students from Sweden. The DSS conducts two rounds of routine data collection in April and in August every year and findings shared with the District Local Governments as well as the public through radio talk shows and spot messages on health education. The DSS provides a population under surveillance for research studies. Up to 21 Ph.D. students (6 during phase III) have used the DSS for their research work. Undergraduate students come for field attachments/internships.

The school of applied statistics used sample data sets from the DSS for teaching masters students. Other colleges could also utilize the data sets, however, questions were raised on whether they were aware of this possibility. The DSS should proactively create awareness on availability of sample data sets which colleges can use for teaching purposes.

The improved infrastructure has strengthened the position of the university as a leader in science research and research training in focal areas for national development including agriculture, health, technology, basic sciences, veterinary medicine and social sciences.

Adequacy of the infrastructure

Limitations still exist with regards to infrastructure, notably laboratory equipment in the GIS lab as well as the laboratories in the colleges. The GIS can only accommodate 30 students/users at a time. Absence of some equipment was cited as a key factor for continuing with the sandwich programme to enable the students' access and use such specialised equipment which is not available locally. The DSS continues to experience software challenges and the database either has to be upgraded or replaced with a new one. License for software updates remain a key challenge. Bandwidth has limited ability to download some documents but this problem is expected to disappear after installation of the campus wide VoIP system, which will improve connectivity.

Sustainability of the established infrastructure

There are mixed results with regards to sustainability of the established infrastructure. A lot will depend on access to sufficient operational funding for DICTS, the GIS lab and the DSS. The library will need more librarians to be trained. Academic librarians need M.Sc. for career progress and ability to offer the services.

The GIS lab is one of the crosscutting laboratories that will benefit from the infrastructure development support under the AfDB loan. It will get an entire floor on the building. However, operational funds, equipment, and software will present serious challenges. Currently there is no user fee for individuals from the public and other universities who use the lab, though those who come for short courses pay. Sustainability of the DSS will heavily depend on its transformation into a semi-autonomous entity able to directly mobilise and manage grants, as well as success in attracting and managing the grants.

4.5 INNOVATION SYSTEMS AND CLUSTER PROGRAMME

At a regional conference held in Tanzania in 2004, consensus emerged that one way to speed up industrial and economic growth in Africa would be to build innovation systems and develop innovative business clusters and Uganda became a member of the new regional programme. In 2009, Uganda adopted a national science, technology and innovation policy, and has designated STI in its national development plan 2010-2015 as a sector that provides institutional and infrastructural support to the production of goods and services (MFPED, 2010).

The Innovation Systems and Clusters Programme-Uganda is a University wide programme implemented at the College of Engineering, Design, Art and Technology. The programme aims at enhancing the competitiveness of Uganda´s businesses locally and globally through innovation systems and cluster initiatives. This entails nurturing linkages between businesses, academia and government by empowering the businesses to engage knowledge centres for appropriate research, and the government for an enabling environment. The specific objectives are:

- Harmonise and integrate innovate cluster activities into existing state and non-state actors programmes.
- Advocate and lobby for formulation of an innovative cluster policy and create awareness among stakeholders.
- Encourage small and medium enterprises to work together through sharing of experiences, skills and other resources.
- To design appropriate technologies and production systems as well as equip the clusters with specialised skills to improve their performance.
- To advance SME´s competitiveness through establishing links with research and development agencies, government and other organisations.

The approach is to create geographically concentrated cluster initiatives in all parts of the country across different industrial sectors, and link these clusters to create national innovation systems in a given industrial sector.

The programme has made a number of achievements and experienced significant growth and expansion over its period of existence since 2005. There has been a sig-

nificant growth and expansion in the number of clusters initiated and nurtured country wide as illustrated in the next table. A total of 102 individuals from the academia have been attached to various clusters including interns, undergraduate, MA and Ph.D. students. Up to 174 existing and potential innovations have been documented, 19 of which were selected and undergoing Intellectual Property processes.

Strategic linkages and networks have been created with the Horticulture Unit under the Ministry of Agriculture, Animal Industry and Fisheries, Private Sector Foundation, Ministry of Trade, Industry and Cooperatives, SNV Netherlands Development Organisation; Makerere University Business School, Common Market for East and Southern Africa, Ministry of Water and Environment, Uganda Industrial Research Institute (UIRI) and Uganda Investment Authority.

The challenges for the programme have been limited resources, closed mindsets, awareness limitations and the rigid framework of Government structures and agencies. The programme is currently in the process of transforming into a centre of excellence in cluster development and innovation based at Makerere University, that is, Cluster Development and Innovation Centre (CDI- Centre, Makerere)

Table 6: Achievements

Achievements	2005	2013
Number of operational cluster initiatives	7	58
Number of innovation systems	0	5
No of trained cluster facilitators	50	853
No of cluster action teams	0	147
No of university staff/students involved	0	102
No of existing and potential innovations	0	174

Table 7: Examples of innovations

Fruit and vegetable	• New packaging and branding (from plastic bottles to glass bottles) • Use of natural preservatives i.e. using Lemon pektins to replace chemicals • Blending of different fruits to achieve color • Packing juice when still hot to avoid contamination • Organic mix for healthy drink
ICT software	• Development of a simple Fleet Management Software • Development of new management model that encourages specialization and cooperation • Web applications • Developed an integrated Bulk SMS Mobile system
Katwe Metal Fabricators	• Rural works vehicle • Perforated clay brick making machine • Development of special, improved harvesting sheering scissors bought up by Mukwano for tea harvesting • Use of plastics bushes to replace rubber or brass, aluminium spacers instead of hard rubber • Development of low density materials
Textile and Garment	• Use of sunlight soap, cold water and fabric softener to remove wax instead of the traditional iron, paper and warm water method • Use of t-shirt off-cuts instead of yarn as a solution to expensive weaving material • New designs like long pointed shoe
Leather processing	• New marketing innovations – delivery of goods to customers • Cluster sensitization of the public on use of natural leather rather than synthetic leather

We were not able to assess this programme in any detail. It is an interesting, innovative and promising initiative, but it is difficult to assess its significance and impact since:

- An evaluation has recently been conducted (Kalinga 2014; but no in-depth assessment of the substance, relevance and future sustainability of individual innovations. It is difficult to understand how a cluster is initiated and maintained, what the incentives for participation from the academic world are and the substance and future potential for the actual innovations.
- Private sector in Uganda is limited to very small and medium-sized enterprises in certain geographic locations and no larger companies (in which most R&D takes place internationally).

4.6 CONCLUDING REMARKS

MaK has established the pre-requisite institutional framework to support and encourage research. Career progression is the main incentive for staff to engage in research. Increasing availability of postdoctoral research grants will be vital for maintaining momentum, enhance retention and increase productivity of the trained Ph.D. capacity.

The support to the reform process was important as it helped to trigger changes including decentralised decision-making and shortened examination periods. Institutional support to gender mainstreaming has been instrumental for MaK's achievement to be a model university on gender issues in East Africa. However, inadequate support systems and lack of sufficient female applicants for graduate training still limit participation of women in research and leadership in the university. Consideration should be given to include part time female staff among those eligible for Sida scholarships under the programme.

Programme support has contributed to improved research management at MaK. There are clear processes for selecting students, elaborate processes for planning and monitoring of research proposals before submission for funding, open and transparent process for selecting research grant awardees, as well as following up masters and Ph.D. students. Clear structures for research management are in place. Nevertheless, there is need to deepen decentralisation in research management, through supporting establishment and running of college based grant units. The university has made efforts for knowledge transfer and commercialisation of research outputs, but more support is needed to improve on capacity to produce policy briefs and popular versions. There is a need to enhance the focus and support to research, technology, innovation and business incubation initiatives as well as supporting researchers to acquire patents.

Coordination of the Sida programme places significant demands on time and effort of the DRGT as well as the unit coordinators. Results framework should be integrated in the planning and implementation of research programmes. Reporting should be improved to focus on performance indicators with a synthesis to show progress towards attainment of programme objectives.

Programme investments in ICT, library, GIS and DSS coupled with acquisition of equipment in college based laboratories following implementation of research projects has improved the environment that support research. However, there is need to continue strengthening the research infrastructure through maintenance of ICT, library, and further equipping the laboratories.

5 Findings and Conlusions

5.1 RELEVANCE

The question about relevance has many facets. The easiest to assess is the compliance with Sida and Ugandan Government policies and priorities. The research cooperation programme is overall in line with the Swedish research support policy: Partner countries should be able to better plan, produce and use research in the fight against poverty (Policy for research in Swedish development cooperation 2010-2014). The programme also supports Ugandan overall development plans and the most recent research policy emphasising the increasing role of research in the socio-economic development of the country. The policy documents are also sufficiently broad to cover a diverse research agenda.

The more difficult questions are to what extent Swedish support remains strategically relevant to further growth and development of research in Uganda, what the limitations and weaknesses are and to what extent another strategy and approach could have created higher volume and quality of research. The following issues and concerns emerged during the evaluation:

Weak links to development of the higher education system
The Swedish support focuses on the first two levels of institutional development – strengthening capacity of individual researchers and MaK as an organisation. There are so far weaker links and efforts to influence the system level as such – the national policies, institutional structures and financing of higher education including researcher training and research. However, Sweden has raised several issues with Ugandan higher education stakeholders, such as the need to increase government funding of research, the long-term sustainability of research, coordination and donor harmonisation within the higher education sector. This report has pointed out several structural weaknesses and limitations that inhibit further growth and development of the higher education sector. The sector is highly fragmented. There is no active national planning of higher education and it is a major challenge that the Government provides no regular support to researcher training and research at MaK. Extensive and long-lasting Swedish support may have delayed necessary reforms by filling gaps in central Government capacity and funding.

Institutional dominance
The Swedish support has clearly been relevant and useful for MaK for a long period of time, but less so for the other four regional public universities. They have benefited from the programme, but to a much smaller extent and as an appendix to the main programme at MaK. There are arguments for establishing one dominant university with a sufficient critical mass of researchers in priority thematic areas and not spread

resources to several institutions. Quality research requires focusing of resources. On the other hand, capacity at MaK has been considerably strengthened while the other universities have remained weak. Time may have come for Sida to consider moving more funds and provide direct support to the other universities, make more funds available for research and researchers outside MaK in order to encourage the growth of a broader and more pluralistic research culture. Such options are presented and discussed in the final chapter on recommendations.

Project orientation

The modus operandi of the Swedish support is not optimal for MaK. It is presented as a research programme, but based on and linked to funding of discrete projects. Within MaK it is managed as a distinct Swedish programme with its own account, Steering and Implementation Committees and Secretariat. There is no active coordination with other external donors, but the Swedish Embassy has maintained contacts and communicated with IDRC on administrative reforms, the Carnegie Corporation, the World Bank and Norway. The current mode of support serves Swedish needs for insight, involvement, supervision and control, but less so for MaK by increasing the academic, administrative and financial transaction costs (by having separate planning and reporting systems and procedures). The overhead in the Sida programme is limited to 6%. There are no senior staff at MAK dedicated full time to the programme and planning and reporting demands from Sida are extensive. An alternative future option is presented and discussed in the final chapter.

Potential thematic distortion

The final question is to what extent the Swedish support is in line with or distorts MaK´s research priorities or in other words to what extent the research agenda is unduly influenced by donor priorities. There is a lengthy and in depth appraisal process for selecting research topics so the selection process is solid. However, a number of interviewees from different levels considered it problematic that the research support of Sida, albeit much broader than many other donors, is limited to topics Sida considers central to development. Excellent proposals for pure and basic research may get (and do get) rejected due to them not fitting the development agenda. This is, of course, natural, as Sida is not the International Mathematical Society and the study of Medieval English does not further Sida's agenda. The size of Sida's research support does, however, raise concerns about the unintended consequences of long-term thematic research funding – more for MaK than for Sida.

Sida support constitutes a lion's share of the university's research budget, as well as of the national budget for research. Sida is, hence, able to infuence the whole institution's research portfolio and focus—and even affect the whole country's research landscape. Continuing strong support to externally selected areas undermines the university's identity as a self-governing institution that is governed by academic ideals. The notion of university as a self-governing institution involves the view that the university serves the society as a whole, instead of serving specific stakeholders (Cloete et al., 2011)—and that notion is threatened by long-term, strong thematic support to only some research areas.

Thematic funding calls are the norm in academic funding and in development cooperation, but at Makerere there is never a donor-funded thematic call for, for instance, pure mathematics, nuclear physics, or critical literature. Accordingly, researchers in donors' thematic areas have superior opportunities for career development, research projects, and personal development, compared to those whose research areas are not donor-fundable. According to a number of interviewees, that causes inequality, frustration and envy. None of this would be an issue if there were national funding opportunities for those subjects that are not covered by donors. However, those are next to none.

The feelings are not limited to the academic world. The bias created by donor support has given rise to sentiments that the government should increase support to science driven by Ugandan interests and values. The former prime minister—now a senior presidential adviser—stated, in his closing speech of the National Policy Dialogue on April 29, 2014, that *"unfortunately, most researchers in this country get money from development partners or donors",* noting that the donor support is driven by donors' interests (New Vision, May 6, 2014, p.10). He continued that one of his colleagues *"has supervised over 10 Master of Arts students investigating homosexuality because donors were funding the students very well, while other areas of research are largely ignored by the donors."* The recommendation was that government should increase funding to research across all disciplines, which is the underlying problem and reason for potential distortion. In our view, the problem of distortion and unintentional consequences of donor funding is more a problem for the Government/MaK, than for the donors, but it is important to discuss how to mitigate such effects.

5.2 EFFICIENCY

Efficiency measures outputs - qualitative and quantitative - in relation to the inputs. Its measurement aims at establishing that the least costly means are used in order to achieve the desired results. The questions are to what extent activities in this programme were cost-efficient, achieved on time and implemented in the most efficient way compared to other alternatives.

Assessments of efficiency are complicated by the fact that anticipated results and effects were not quantified in detail in advance in a consolidated programme document. The original programme had, for instance, only some numerical targets for training of MAs and Ph.D.'s. The overall results matrix is incomplete and there is no updated/revised programme document. The results framework has neither been used by Sida or MaK for systematically monitoring progress and achievements. Indicators for measuring changes in institutional capacity are also missing. Main observations about efficiency are:

- The numbers of MAs and Ph.D.s enrolled are as expected or higher (for MAs). Most graduates between 2010 and 2014 started under the previous programme period. The total number of graduates during 2010 to 2014 are few

both from this and the previous programme period. There have also been delays in completing studies for a large number of students, Funding was delayed at the beginning of the programme for over six month hence Ph.D. students who started during this phase have at most three years and under the circumstances of continued teaching workload would not be expected to have completed by May 2014.

- The general cross cutting courses for researchers are successfully completed. Those courses have been an unquestionable success, with broad acceptance from all stakeholders, and with a clear call for extending the courses to more students and staff members. Efficiency, in terms of resources invested and the transformative outcomes achieved, has been outstanding.

- The research outputs have been low, except for the health sciences sub programme (CHS), which has achieved very good results. Quantitatively speaking, the number of publications from other programs than CHS was 98 articles for 131M SEK spent, which, for a research funding would be unacceptably low, even if one takes into account the infrastructural and other programme components. However, the programme is not a research programme but researcher training programme, and article numbers are not a completely unproblematic indicator for researcher training programmes. Especially in those cases, where the standard thesis format is a monograph, even a groundbreaking thesis may not yield any journal articles. Qualitatively speaking, the outputs are of varying quality: There is potential and examples of leading edge research of highest international standards, but there are also publications in substandard journals that fail to meet the criteria for academic arenas.

- The activities and expected outputs for the change management project have been completed and a large number of manuals, policies and guidelines are in place and administrative/financial reforms carried out, but the short- and long-term outcomes are difficult to measure.

- The programme is implemented within the existing structures of the university. Coordination of the programme by the small team at DRGT and the sub programme coordinators in the units points to an efficient undertaking. However, workload as a result of the coordination activities impairs performance of DRGT staff. The investment in the Human Resource through Ph.D. and masters training as well as equipment will greatly benefit MaK and the country at large. However, the limited number of postdoctoral grants does not allow for maximising productivity of the established Ph.D. capacity.

- There is an ongoing discussion of the cost-effectiveness of the various programme components. The sandwich model for Ph.D. training is the best example. Looking at for instance the budget for the Ph.D. training in the Science programme, there are four main categories of costs: (a) Uganda for Uganda (equipment, field work, grants used in Uganda), (b) Sweden for Sweden (administration, supervision and travel Swedish partners), (c) Sweden for Uganda (equipment) and (d) Swedish institute (subsistence grants for Ugandan stu-

dents). The direct costs for the Swedish coordinators absorb approx. 37% of the total budget. Including also the costs and travel to Sweden for Ugandan students, the percentage increases to 56%. In other words, a sandwich programme is costly. There is also considerable frustration at MaK of Swedish supervisors being paid while Ugandan counterparts are not.

The costs of a sandwich programme could possibly be reduced, but that is not the real issue. With the current budget, MaK could clearly train more Ph.D.´s using their own academic resources. For instance, CHS is unquestionably ready for independently undertaking doctoral training without any further Swedish support. The questions are two: Can they do it and what is the added value of the Swedish link? The answer to the first question is to an increasing extent yes and a gradual move to a national training mode is expected in several of the colleges for the next period. The tangible and intangible benefits for the students and MaK of visits and training in Sweden are difficult to measure. As discussed elsewhere in the report, the feedback from Ugandan students and Swedish supervisors about the continued value of cooperation are unambiguously positive. So there is an added value of the Swedish link, even if national capacity for researcher training exists.

- The project mode of support incurs additional managerial and administrative costs for MaK – direct costs for project staff, but indirect costs for participation in Steering and Implementation Committees, separate planning and reporting processes, preparation and participation in supervision and evaluation missions, etc. are much more significant. There are no effective donor coordination mechanisms in place for external support to researcher training and research – neither among the donors nor initiated by MaK which could have reduced some of those costs.

- There is some frustration among MaK staff around planning and reporting systems and procedures. Reporting formats were said to be changed and difficult to use. Some of the colleges claimed that the Swedish Embassy at times had micro-managed the planning processes while the Embassy informed the team that it just followed the requirements set by Sida. Programme focal points said in a meeting that the reports had an overload of detailed data and information. It could be that when it is not clear what to report – too much is reported. What is missing in our view is a small set of aggregate performance indicators consistently collected and used for programme monitoring and reporting. Many of the reports are far too detailed (on individual students), weak on substance and analysis of relevance and effectiveness. There have been courses on RBM and some sub programmes were reformatted using a results-framework, but RBM is not used for regular systematic monitoring and planning. For that to happen, the system should have been in place from the start of the programme and not introduced when it is already under implementation.

5.3 EFFECTIVENESS

Effectiveness is a measure of the extent to which the programme attains its objectives. The overall objective is to strengthen the national research capacity and improve the quality of research conducted in Uganda in areas of national relevance to contribute to poverty reduction and the country's sustainable development.

Effectiveness can be measured against verifiable indicators specified at the beginning of the programme. However, there is as mentioned not a set of core performance indicators and benchmarks for all the components in the programme. Hence, it is difficult to measure to what extent the overall programme objectives have been achieved [16]. The following provides a brief summary of our findings (on a scale from 0 to 10) pertaining to each of the expected outcomes.

Table 8: Expected outcomes

Expected outcomes	1	2	3	4	5	6	7	8	9	10
Increased capacity to carry out quality and relevant research at MAK.										
Enhanced capacity for supervisors to supervise Masters and Doctoral studies.										
Increased capacity to conduct research in other public universities.										
Increased research productivity i.e. publications contributing to enhanced visibility among peers.										
Evidence-based policy making in the areas of importance for national development.										
Improved research management and coordination in MAK.										
Quality research conducted in areas relevant to national development needs.										
Environment for research further improved (library and ICT resources, lab infrastructure, DSS).										
Increased generation and uptake of new innovations/technologies.										
Improved research communication.										

[16] There are some indicators suggested in the results framework, but it is not a complete list for all programme components, baseline data are missing or questionable and it has not been used for monitoring and reporting.

Increased collaboration with other research institutions/universities internationally and nationally, thereby strengthening of the national research system.										

Increased capacity to carry out relevant research at MaK
The capacity to carry out research and relevant research has clearly been enhanced. One indicator is retention of staff. The Quality Assurance Directorate is carrying out a tracer study of Sida funded graduates. Numbers from the Technology Programme indicate that 13 out of 22 graduates are still staff at MaK. One has been a lecturer at another university, four started to work for Government Ministries/Kampala Municipality, one for the National Council for Science and Technology and three left/retired. Findings from College of Health Sciences reveal that none of the 28 trained PhDs during this Phase have left the country, majority are still with the college while two have joined other institutions within Uganda.

Capacity for supervisors to supervise
The capacity for supervisors to supervise has also been strengthened, but the feedback from the Ugandan supervisors indicates that they have not had the time for supervision. Weaknesses in supervision in this programme have not been as much about supervision capacity as they have been about lack of time and other resources for quality supervision. In a sense, the programme's motto "to support the supervisor to supervise" has not been met.

Capacity in other regional universities
The capacity in the other regional public universities is only marginally increased. The level of inputs has been small and the capacity building effects negligible.

Research productivity
Research productivity has been enhanced, but with significant variation between colleges. The publication rate is overall very low—98 journal articles in programs other than health sciences. In health sciences, however, there is a very high number of high quality publications.

Research management
Policies, tools and guidelines for improved research management and coordination in place. The Directorate of Quality Assurance has played an important role in preparing relevant documents. We have not been able to determine the use, usefulness and effects of the new policies and tools in this evaluation due to time constraints.

Relevance of research
The research conducted is largely relevant to national development needs, but we have not been able as part of this short evaluation to assess how relevant the conducted research is within different thematic areas.

Evidence based policy-making

There is a weak link between research and evidence based policy-making, despite increasing examples of potential policy influence from several sectors.

Examples of potential policy influence

Increased volume of membership on boards of institutions, e.g. Forum for Women Educationists Uganda, International Association of Feminist Economists, Uganda National Academy of Sciences, Uganda Women's National ICT Caucus, Uganda AIDS Commission and Uganda National Health Research Organisation.

Social sciences participated in the formation of the National Aids Policy, in the policy on ARVs, the National Gender Policy and the National Defence Policy. The FSS was invited by the Minister of Disaster Preparedness to contribute to the designing of a programme for Reconstruction of Northern Uganda.

Environment for research

The environment for research has clearly improved. Benchmarks have been identified for the University´s focus of being research led. The proportion of academic staff with Ph.D.´s has reached 67%. The proportion of graduate students is about 15%. The Ph.D. graduation numbers have reached approx. 60 per year and the current enrolment is 600. The university has graduated over 300 Ph.D.´s in the period 2000-2012 representing a progression from 8 in 2000 to 61 in 2012.

Generation and uptake of innovations

There is increased generation and uptake of new technologies and innovation in the Innovation and Cluster Programme, but the innovations and their results are not well documented. There is also increasing efforts to facilitate uptake and commercialisation of products of research and innovations but capacity is limiting.

Dissemination and communication of research

There is evidence of improved dissemination and communication of research findings, but this is an area, which is still too weak and unsystematic.

Collaboration and partnerships

There is increased collaboration with research institutions and universities in Sweden and also evidence of regional and inter-regional collaboration, but in particular regional- and interregional partnerships are not well documented in reports. The textbox below provides some examples of networks established.

Networks established

- The Dept. of Social Work & Social Administration has operationalised the MoU with Gothenburg University's Social Work Dept., through staff and student exchange.
- The University has signed an MoU establishing the ErasmusMundus Masters programme in Family Social Work and Policy (MUNDUS FAMILY) bringing together four Universities: Makerere University, the ISCTE-Lisbon University Institute (Portugal), the University of Gothenburg (Sweden) and the University of Stavanger (Norway).
- Renewal of the MoU of the Programme for African New Generation of Academics (PANGeA) with Stellenbosch, Malawi, Nairobi Universities – coordinated by the University of Stellenbosch, South Africa.
- Developing Sustainable Community Health Resources in Poor Setting in Uganda (CoHeRe) Project. Funded by the Netherlands Organization for Scientific Research. This is a research project bringing together Makerere University and the University of Amsterdam.
- Collaborative research project on the Promotion of Professional Social Work towards Social Development and Poverty Reduction in East Africa between Carinthia University (Austria), Makerere University, University of Nairobi, Institute of Social Work (Tanzania) and the National University of Rwanda.

5.4 SUSTAINABILITY

Sustainability is concerned with measuring whether the benefits of the programme are likely to continue after external funding has finished. Sustainability can be analysed from four perspectives – academic, institutional, organisational and financial. The main issues and concerns identified in this evaluation are:

- A major achievement of the Swedish support is a significant enhancement of the academic sustainability at MaK. More staff have completed their Ph.D.´s, Post Doc researchers are trained and provided research opportunities, relevant and promising research has been conducted and infrastructure for research has been strengthened.

- The organisational capacity and sustainability have also been strengthened. The university has been able to formulate, introduce and implement a broad range of policies, guidelines and financial/administrative procedures making the university more efficient, effective and sustainable. The most important is possibly the capacity to train and supervise MA and Ph.D. students with internal resources. The programme has also helped to build a stronger research culture at MaK.

The programme has not been able to impact on the national institutional structure for research. There have been no or few changes in the period 2010-2014 in national policies, governance, management and funding of research in higher education institutions.

Funding of research training and research remains the most critical issue for MaK. Sida and other external donors have been and still are the primary source of funding for researcher training and research. There is still no separate budget line for research at MaK. The attempts to supplement donor and government funding with internally

raised funds for research (for example by increasing tuition fees and by regulating and charging a fee on consultancies) have added marginal resources. Donor financing does not form a good basis for the maintenance of the quality of research capacity in the long term.

5.5 WIDER IMPACT

Wider impact refers to long-term effects resulting from the research programme on social, economic, and environmental and other development indicators. The large question is what difference the research cooperation programme has had on Uganda´s development and poverty reduction[17]?

Previous evaluations of research cooperation have painted a rather gloomy picture of the wider effects (Boeren 2006. p.18). The results of research have only been used to a very limited extent in society outside the university world or in the private sector, and have only occasionally been applied in operations with a poverty reduction focus. The link between research activities and national poverty reduction has been described as weak. One reason is said to be that Sida has not emphasised enough direct poverty alleviation in the selection of research projects. Another is that that wealth created from increased knowledge does not come instantly, but is an indirect consequence of research.

The majority of the research topics in the current programme appear relevant to Uganda´s development. However, the impact of research on social and economic development and poverty reduction is not only about selecting research topics with apparently high political and developmental relevance. The quality of research is often more important. Low quality research on politically correct topics is often of limited value. However, this evaluation has not assessed the quality of research so this question needs further analysis.

Although there are links between research at MaK with government departments, the impact of research on national policy is less clear. So are also the contributions to global scientific debates. However, colleges at MaK have functional or consultative links with several government ministries or departments. They are to some extent involved in policy development, consultancy activities, advisory boards, and profes-

[17] Previously (before 2008) the main underlying assumption in Sida was that research capacity would be beneficial for development in its own right and that it was not needed to be proved. The mandate of the research cooperation was only to create the capacity, thus the monitoring focused only on number of PhDs and publications, workshops etc. After 2008, RBM came into focus and changed the way Sida looked at capacity. Capacity and knowledge were seen as useless unless it was used. Thus, partners were asked how their generated evidence based knowledge and analytical capacity was used.

sional bodies, but it seems that the linkages are relatively weak and based on individual initiatives.

This evaluation concludes that:

- MaK has made deliberate efforts to select and prioritise research projects with high relevance and potential development impact.
- Most of the research projects have a high score on social relevance and utility.
- There are increasing, but not sufficient efforts to disseminate and follow up results from research projects.
- Certain academic staff are used as advisors and preferred consultants to the government, but the links between the university and government, private sector and civil society is weak.
- Several research projects have potential direct utility and impact, but in most cases the effects are indirect and long-term.

The Sida financed research contributes to create conditions and support processes that may lead to poverty reduction, but the quality and impact of research would require another study.

The University provides the following examples of wider impact, but we have not been able to look at those in any depth to assess their importance and impact.

Examples of wider impact

Medicine and Public Health
- Pharmacology influenced the national policies on treatment regimes for malaria.
- Work on diagnosis and treatment of fever and pneumonia policies has influenced national and international (WHO/UNICEF) policies and practice.

Poverty and vulnerable populations
- Work on obstetric fistula.
- Multi-drug resistant.
- Diagnosis and treatment of fever and cough at home by community based health workers.

Agriculture
- Research technologies being used in national agenda –pioneered vermi-composting in municipalities in Uganda.
- Research technologies contributing towards alleviation of pressing needs of the communities e.g. garbage accumulation, degraded soils, agricultural pests, degraded rangelands and harsh weather conditions.

Social sciences
- Enriched and impacted public debate on the development of the current National Development Plan.
- Influenced public debate and policy on topics of national importance through evidence-based research for dialogue, e.g. in the Small Arms disarmament deal and in the Juba Peace talks.
- Social sciences participated in the formulation of the National Aids Policy), the policy on ARVs, the National Gender Policy and the National Defence Policy. Ethics and integrity committees have been established in local governments.
- Increased volume of membership on boards of institutions, e.g. Forum for Women Educationists Uganda, International Association of Feminist Economists, Uganda National Academy of Sciences, Uganda Women's National ICT Caucus, Uganda AIDS Commission, Uganda National Health Research Organisation, School Management Committees.

Universities and economic development

Policy documents often take as a premise that science, technology and innovation plays a critical role in enhancing economic growth and contributes to national development. Higher education institutions are believed to deliver the knowledge requirements for development. There is unfortunately no direct causal link between STI and economic development. A study of the connections between African universities and economic development was carried out in 2012 (N. Cloete et. al. Universities and economic development in Africa) including Makerere University. The analytical framework and findings are relevant and informative also for this evaluation. The study does not try to measure the actual developmental impact of higher education, but the preconditions for that to happen.

The analytical point of departure is under what conditions each university in Africa, as elsewhere, is contributing to economic development. They argue that the link between universities and economic development are influenced by three inter-related factors (see also box):

- A condition for effective university contributions to development is the existence of a broad pact between government, universities and core socio-economic actors about the nature of the role of universities in development.

- As a core knowledge institution, the university can only participate in the global knowledge economy and make a sustainable contribution to development if its academic core is quantitatively and qualitatively strong.

- For linking universities effectively to development, a country needs various forms and methods of knowledge policy coordination. In addition, the connectedness between the larger policy context, universities and development is crucial.

The existence of a pact
Key to the development of such a pact is agreement or consensus that there should be a role for higher education and then about what that role should entail. In order to investigate this aspect, the study analyzed the following questions:

- Is there a role for knowledge production and for universities in the national development plan?
- How do the relevant national authorities and institutional stakeholders talk about and conceptualize the role of universities, and is there consensus or disjuncture?

The academic core
The interest in the academic core had the following two dimensions:

- What is the strength of the academic cores of these universities?
- Has there been a strengthening or weakening of these academic cores in recent years?

The input and output indicators were:

- Increased enrolments in science, engineering and technology (SET)
- Increased postgraduate enrolments
- A favorable academic staff to student ratio
- A high proportion of academic staff with doctoral degrees
- Adequate research funding per academic
- High graduation rates in SET fields
- Increased knowledge production in the form of doctoral graduates
- Knowledge production in the form of research publications in recognized ISI journals

Coordination and connectedness
Coordination was used to refer to more structured forms of interaction, mainly between government and private sector/civil society; and the knowledge policies and implementation activities of different government departments, particularly departments of education, science and technology, and research councils. Three questions were discussed:

- Do governments coordinate policies and programmes that are aimed at enabling the universities to contribute to development?
- Do the universities connect to external groupings in ways that promote development?
- Do development activities in the universities strengthen or weaken their academic core?

How did Uganda and MaK fare in meeting the 'preconditions' for an effective and productive relationship between higher education and economic development? In summary, there was very little evidence found in either the interviews with university stakeholders, or in policy and strategy documents, of strong linkages with government or industry – although there was some evidence of the intention to strengthen these linkages. In addition, there was no evidence of formal structures or platforms for interaction between these role players.

The dominant focus of the development approach that both the *Poverty Eradication Action Plan* and the national development plan recognized was the need to eradicate poverty through stimulating and maintaining high levels of economic growth. In order to attain the growth and poverty eradication objectives, the roles of education, human capital development broadly and science and technology were acknowledged as well as the facts that inadequate human resources and low levels of investment in science and technology were key binding constraints. While there were positive signs of an emerging awareness of the importance of the knowledge economy in new national plans, the role of higher education had not been clarified or agreed upon.

Within the recent government and university documents, there was recognition of the importance of the knowledge role of the university. In particular, higher education was beginning to be recognized as a contributor to development, and not just as a provider of human resources for the civil service. However, the government was not investing sufficiently in either the universities or innovation, nor had it provided appropriate incentives for partnerships. Furthermore, this growing development awareness had not been translated into coordinated policies or implementation actions, as both the government and the university were having problems in making tough reallocation decisions.

The MaK academic core had some input strengths on which the institution could build. The challenge will be to translate these into stronger outputs. From the study of the development projects, it also seemed that while the projects were strongly articulated to development needs, much more could be done to strengthen the academic core of the university, which would enable it to make a more sustainable contribution to development.

In general, very limited evidence could be gleaned of partnerships between the state, the universities and the private sector. At the time of the study, Uganda had not invested sufficiently either in its universities or its private sector, nor had it provided appropriate incentives for partnerships to develop between these two sets of important actors. While some institutional leaders reported that the university encourages disciplines to form consulting firms, one respondent reported that government frequently used foreign firms rather than locals for consultancies. Another respondent spoke about limited trust between government and the university and that the government did not always recognize the value of the institution.

6 Future Options and Lessons Learned

6.1 FUTURE OPTIONS

The Swedish research cooperation with Uganda started in 2000 and has as such been going on for nearly 14 years. The cooperation has changed over time in form and volume, but the focus has been on research and researcher training at MaK - the single most important public university in Uganda. Strong links have been maintained with Swedish universities in Ph.D. sandwich training and joint research. Four other public universities have been supported through MaK both in terms of training and organisational capacity.

This evaluation has documented positive results of Swedish support at individual and organisational levels. Qualified researchers are educated in a broad range of priority areas for Uganda. Organisational capacities are strengthened and the socio-economic relevance and impact of research are enhanced. The programme still suffers from internal and external inefficiencies, but the most critical and difficult question is to what extent there is a need for change so that the same resources could be used more efficiently and effectively in the future.

Such change is not necessarily driven by failures in the current programme, but more by changes in the research context and the mere fact that external Swedish support should supplement, catalyse and not replace national initiatives and responsibilities. MaK is the dominant research university in Uganda and Sida has been and still remains the main donor and supporter with marginal counterpart funding from the Government. This has helped to create more robust research capacity in one institution. The question is to what extent there is a need to diversify the funding and help to create a broader and more pluralistic research culture in Uganda.

There are no clear answers to such questions, but we present and discuss options through a number of different scenarios. The scenarios are not necessarily mutually exclusive and a combination of them is possible. The scenarios are of a broad strategic nature. The two first scenarios focus on MaK and represent modifications and reforms of the current strategy, while the next open up for broader support to also other institutions.

Scenario 1: Stronger focus on thematic research areas

The current programme of support (2010-2014) is broad and cover a wide range of thematic programmes and types of interventions. Its overriding goal has been to produce a critical mass of quality researchers through sandwich training and to some extent research of high socio-economic relevance and potential impact. Based on a request from the Swedish Embassy, MaK prepared a “Concept Note for Uganda-

Swedish Research Cooperation 2015-2020". The note is based on the current programme, but seeks to introduce new ideas and shift the balance between various components in the programme such as:

- Establish a small number of multi-disciplinary research teams in selected areas.
- Gradually replace the sandwich model with national Ph.D. training based on assessments of capacities in each college.
- Increase support to Post-Doc training and research (shift from researcher training to actual research) since it has been a problem that few Ph.D.´s become engaged as researchers due to lack of funds to conduct research.
- Continue and diversify institutional support to crosscutting areas such as ICT, libraries, quality assurance, gender, organisational reform, etc.
- Increase number of staff to be trained from all the other four public universities.

We have not carried out an appraisal of this proposal and it is still only at a conceptual level. It addresses some of the limitations and imbalances in the current programme and represents a logical and constructive progression taking into consideration that a large number of Ph.D.´s are trained and need opportunities for conducting research, and that the internal academic and organisational capacities in several colleges have been enhanced.

However, it is a broad proposal. Even broader than the previous and embodies a mix of expectations and aspirations from university stakeholders. A basic premise is also that MaK is and shall remain the dominant research university in Uganda.

Scenario 2: Harmonized donor support to a university research strategy and programme

There is a broad range of external donors to MaK supporting various thematic areas and colleges. There is some communication between donors, but the actual coordination of planning and reporting processes are marginal or absent. The Swedish programme is prepared separately and bilaterally with MaK and the same is true for Norad, Carnegie Foundation, the World Bank, etc.

The principles of harmonisation and alignment are not practiced within the higher education sector in Uganda. The support from Sida is ultimately linked to projects even if they are packaged within a programme. The current donor approach is accepted by the university (as a recipient with few other choices), but the multiple and partly conflicting planning and reporting requirements and the large number of delegations, reviews and evaluation place a burden on the already weak internal organisational capacity. A desirable alternative for MaK would be increased core or institu-

tional support to a joint research strategy and research programme based on consultations with all relevant donors. If the substance of such a programme and the supporting financial and managerial processes were found adequate in a joint appraisal – this scenario is an alternative for the donor community.

The next two scenarios go further and explore alternative/supplementary options to the almost exclusive focus on MaK. The arguments are: Firstly, Sida has provided support to MaK for a long period of time. Capacities are strengthened at all levels. The "job" is not completely done, but time has come to scale down and move on to avoid complacency and motivate the government to take more financial responsibility for research training and research. It is not healthy that the research agenda is almost entirely dependent on donor funding at one university. Secondly, there is a need to create a more pluralistic research structure and culture in Uganda. There are quality researchers in other universities than MaK in need of financial support. Other universities also require more and better-qualified researchers and access to research funds. A broader and more competitive research culture is healthy. There are two possible options: establishing a national competitive research fund and shift more resources to the other universities.

Scenario 3: Support a national research fund

Grant support for research allocated on a competitive basis is still practiced on a very small scale in academic institutions in Uganda, and mainly such by Makerere University for the beneficiaries within that same particular institution. However, over the last five years, greater attention has been put in developing competitive grants schemes for support to research. Competitive grants schemes are preferred mechanisms of financing research especially where resources are limited, provided that they are administered with transparency, and is merit-based and rule-bound. The recent reform in agricultural research financing established a competitive grants scheme for agricultural research under the National Agricultural Research Organization.

The Uganda Millennium Science Initiative (MSI) Project co-financed by the government of Uganda (US$ 3.35 million) and the International Development Association (US$ 30 million) starting initially from 2006/2007 to 2010/2011 are examples of financing research on a competitive basis. An associated scheme is "Support to Scientists" which the government set up in financial year 2006/2007. This scheme was initiated at the request of H.E. President Museveni to support scientists who would have innovative near-market ideas/products/technologies.

A competitive national fund will issue calls for proposals. Qualified researchers from all Ugandan research institutions can apply. It will also be competitive and only high

quality proposals will be funded. There are three options for locating a research fund. The first alternative is a national fund. The second is per university[18]. Then the fund would cater for individual researchers within that institution. The third alternative is a college or faculty. There are arguments in favour and against each of those options. However, the idea of promoting a research culture in which conventional standards for managing scientific activities apply, suggests that the fund model should be placed at the research council level, but it presupposes that an effective system is in place in which all parts are seen as interdependent and objective actors. A governance and decision making system perceived as transparent, efficient, professional and fair are required. In the absence of such a system, management easily becomes personalised with criticism of nepotism and inefficiency.[19] A national fund can easily become politicized. Currently, those concerns are too strong to be ignored and administrative components independent from anything existing may be necessary.

If Sida would consider providing more support to a national fund, it has to be on two conditions: (a) A robust governance, review and decision making system in place, and (b) dedicated qualified personnel.

Scenario 4: Increase support to regional universities

The other four public universities have benefited from the previous and ongoing programme, but only indirectly through MaK and marginally. If justified through a more systematic assessment, Swedish support could be used to strengthen the capacities in one or all the other public universities through more direct and larger support. We have not assessed to what extent this is feasible and should happen, but suggest that it is a possible scenario. The scenario might not be an easy one—compared to the smaller universities, support to the well-established MaK is the easy way out. But the scenario is justified by regional development outside the already well-off capital city, by narrowing the gap between MaK and other public universities instead of widening them, by facilitating a more diverse and pluralistic university sector, by avoiding the trap of diminishing returns with a single recipient, and by de-centralization and increased competition in the university sector.

6.2 LESSONS LEARNED

Unintended dilemmas

The Swedish investment in researcher training and research has contributed to building research capacity, research structures and not least a culture of research at MaK.

[18] See discussion of alternative locations in Hyden (2006).

[19] The Sida guidelines for support to national research development (2008) opens for establishing a National research fund or university research funds as long as ”proposals include detailed plans for development of administrative mechanisms, as well as proposer procedures for calls for proposals, selection and assessment of research applications”.

The consistent, long-term and predictable funding and support provide a model for capacity strengthening focusing on training individuals and building necessary support structures (ICT, libraries, management, etc.). However, even such a well-intended programme has its non-intended consequences. It is problematic that Sweden and other external donors after fourteen years still remain almost exclusive funders of research and researcher training at MaK. This is not sustainable and healthy for the development of future research in MaK and Uganda.

Distortion of national research priorities?

Swedish funding may have become too dominant shaping the Ugandan research agenda – not intentionally, but because of the weak Government support to Ugandan research. It is also a danger that the large volume of Swedish support delays necessary change and increase in national funding. Long-term funding can easily be taken for granted and loose its catalytic character.

A monolithic research structure

The Swedish support has also helped to consolidate MaK as the dominant university in Uganda. There is an increasing number of public and private universities in the country, but most are involved in teaching at undergraduate levels. MaK remains the only important university for researcher training (Ph.D.) and research. There are arguments for building one strong and effective university in a country with constrained resources. On the other hand, there is need and demand for more universities in the country, a more heterogeneous university structure and pluralistic research culture. If Sida wants to prioritise quality and reward success, the current model of support should be continued. If the focus is on building and strengthening future and broader research capacity, more Swedish support should be channelled to other universities.

The changing roles of higher education and universities

There is an inherent focus and bias in academic institutions towards tangible research outputs: number of Ph.D.´s graduated, books and articles in peer reviewed journals and career development. In parallel, there is an increasing (and to some extent externally imposed) pressure to be relevant to social and economic development and a subsequent emphasis on dissemination, utilisation and follow up of research. The move towards relevance is pursued differently at MaK.

The balance between often conflicting expectations of universities needs to be discussed further - taking into consideration that researchers are not necessarily the best problem solvers/consultants and that quality research is not by definition immediately applicable and relevant. The strategic roles of universities should be discussed when future support is decided. Four roles (Cloete, 2012) describes alternative orientations:

- **The university as ancillary**: In this notion, there is no need for a strong (scientific) knowledge basis for development strategies and policies. Neither is it necessary for the university to play a direct role in development since the emphasis is on investments in basic health care, agricultural production and primary education. The role of universities is to produce educated civil servants and professionals (with teaching based on transmitting established knowledge rather than on research), as well as different forms of community service.
- **The university as self-governing institution**: Knowledge produced at the university is considered important for national development – especially for the improvement of health care and the strengthening of agricultural production. However, this notion assumes that the most relevant knowledge is produced when academics from the North and the South cooperate in externally funded projects, rather than being steered by the state. The university plays an important role in developing the national identity, and in producing high-level bureaucrats and scientific knowledge, but not directly related to national development. This notion assumes that the university is most effective when it is left to itself, and can determine its own priorities. It also assumes there is no need to invest additional public funds to increase the relevance of the university.
- **The university as instrument for development agendas**: In this notion, the university has an important role to play in national development – not through the production of new scientific knowledge, but through expertise exchange and capacity building. The focus of the university's development efforts should be on contributing to reducing poverty and disease, to improving agricultural production, and to supporting small business development – primarily through consultancy activities and through direct involvement in local communities.
- **The university as engine of development:** This notion assumes that knowledge plays a central role in national development – in relation to improving health care and agricultural production, but also in relation to innovations in the private sector, especially in areas such as information and communication technology, biotechnology and engineering. Within this notion the university is seen as (one of) the core institutions in the national development model. The underlying assumption is that the university is the only institution in society that can provide an adequate foundation for the complexities of the emerging knowledge economy when it comes to producing the relevant skills and competencies of employees in all major sectors, as well as to the production of user-oriented knowledge (see Cloete 2012).

At the national level, the instrumental notion was clearly the strongest, followed by engine of development and self-governing. The engine of development notion was to be found mainly in science and technology policies and in national vision statements, but not in The Ministry of Education. In the case of the instrumental notion, government officials felt that the university was not doing enough, but there were no policies either that spell out the instrumental role. The Sida research policy and funding promotes the university as an instrument for the national development agenda.

At Mak, the narrative of the importance of a knowledge economy amongst university stakeholders is emerging, but the self-governing notion is very strong. A development orientation is also present, but the growing development awareness had not been translated into coordinated policies or implementation actions.

Annex 1: Terms of Reference

Evaluation of Swedish government funded research cooperation support to Uganda 2009-2014

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 Uganda. The evaluation results will inform the design of a possible continuation of such support to Uganda 2015-2020.

The point of departure is the overall objectives of the 'Strategy for Sida's Support for Research Cooperation 2010-2014': *to strengthen and develop research of relevance to the fight against poverty in developing countries* and in the relation to research capacity building in developing countries:*partner countries and regional research actors being able to better plan, produce and use research in the fight against poverty.*[20]

The evaluation shall cover the period 2009-2014.

The evaluation shall cover the bilateral research cooperation programme with Makerere University and the four regional partner universities Kyambogo, Busitema, Gulu universities and Mbarara University of Science and Technology, during the period 2009-2014.

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 Makerere University (MaK) since the start of the program year 2000 (i.e. impact), and how the program has contributed to change.

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

[20] *'Research for Development: Policy for Research in Swedish Development Cooperation 2010-2014 and Strategy for Sida's support for Research Cooperation 2010-2014.* p. 23.

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.

(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 Uganda was initiated in 2000 and it consisted of institutional research capacity strengthening support aimed at building sustainable research capacity. To contribute to the establishment of a coherent agenda for research and research training in Uganda, the support has been focused at Makerere University, the largest public university in the country. There has been three consecutive agreement periods since the start in 2000, which have amounted to SEK 315 million. The current agreement period 2010-2014 amounts to SEK 180 million (total support 495mSEK).

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 universities. The programme aimed to support MaK towards its goal of becoming a vibrant, internationally competitive, research university. During the current research agreement 2010-2014 four public universities were also introduced into the cooperation (see p.1).

The *main objective* of the bilateral research cooperation in Uganda for 2010-2014 was defined to be to enhance capacity of public higher education institutions to conduct

and sustain strategic and quality research that will contribute to the development needs of Uganda and beyond through building a critical mass of independent thinking researchers.[21]

The current agreement 2010-2014 which is to be evaluated entails support to 105 PhD students, 42 MA students and 20 Post-Doc researchers in 12 different units. Institutional support goes to libraries, laboratories, the Iganga/Mayuge Demographic Surveillance Site, academic quality assurance, gender mainstreaming and the 'Makerere University Research, Administrative and Financial Reform'. The support is directed to support an environment that is conducive for research and research training. The support to individual research projects within College based research and research training programs is a tool to achieve this goal and has the slogan "to support the supervisor to supervise".

3. Stakeholder involvement
Makerere University, Directorate of Research and Graduate Studies (DRGT) has given comments to the Terms of Reference of this evaluation.

Swedish coordinators and supervisors conducted a written survey on the Research Cooperation program with Uganda 2010-2013, discussed during a Research Coordination Meeting at Sida HQ 9/4 2013.[22] The report from this event has fed into the Terms of Reference of the evaluation. Swedish coordinators have also commented on the ToR.

4. Specific evaluation questions to respond to:

Relevance

1. Is the research cooperation program consistent with MaK's policy and development priorities, needs and institutional capacity?
2. Are the research projects in the program relevant to the current development goals of Uganda, especially of the aim to reduce poverty in the country?
3. Does the research cooperation program effectively and sustainably support strengthening of the research environment at the 4 partner public universities in the view of the partner universities?

[21]Assessment Memorandum, Christina de Carvalho Eriksson, 18/1 2010: 'Continued Bilateral Research Cooperation with Uganda 1 January to 30 June 2014', p. 7.

[22]See minutes: 'Final protocol MuK seminarium 9 April 2013.

4. 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 Makerere staff. How can the use of the RBM tool be strengthened?

Scientific quality

5. Produce an overview, based on available MaK data, of the number of academic publications produced within the Swedish research program published at international and national scientific journals during the evaluation period.
6. Are the current MaK quality assurance mechanisms and policy effectively used in practice? Are staff aware of 'the Guiding Principles of the Quality Assurance Policy'[23], being guided by them in their work? Does the local PhD supervision follow MaK quality assurance regulations?
7. Outline and evaluate the review process of research proposals at College level used within the program, and compare this to MaK as a whole.
8. Outline to what extent the research cooperation has impacted on academic quality and research culture in the context of PhD training and supervision in relevant Colleges at the University.
9. What is the assessed scientific quality of Makerere University PhD programs with regard to local course work (apart from generic cross-cutting PhD courses)?
10. Evaluate the use of 'Double Degrees'[24] in the Sida program. What is the added value for MaK and for Swedish institutions to graduate students with double degrees? What are the challenges?

Efficiency

11. Describe to what extent donor coordination has been implemented/improved at MaK, and if funding partners' complementarity and/or program overlap has been considered (being a basis for strategic planning/decision-making).
12. In the context of research cooperation, assess added value and comparative strengths of Sweden as a partner to MaK, as compared to other international funding partners.

[23]See 'Makerere University Self-Assessment Report October 2013', Directorate of Quality Assurance, p. 21-22.

[24]A student receiving a PhD degree from both MaK and a Swedish university.

13. What is the average time needed for completion of PhD studies within the program? What are reasons for having difficulties to finalise studies or for leaving the program? Do some units have more difficulties with this than others? Is there a gender difference?

Effectiveness

14. Outline how the program has during this evaluation period contributed to research facilities (laboratories, the Demographic Surveillance Site, ICT infrastructure, library services).
15. Assess if the 'Assessment of Application from Makerere University'[25] has been followed-up by MaK: are goals implemented and have expected objectives been reached.
16. Assess quality and effectiveness of the crosscutting PhD courses offered by MaK to all PhD candidates.
17. Assess the utilization, management, and the financial sustainability of the Iganga-Mayuge Demographic Surveillance Site (DSS).
18. Assess the Swedish and Ugandan PhD supervision within the program, including communication between supervisors, and supervisors and students. In what way has the theme/goal 'to support supervisors to supervise' been realized? Has any change in supervision been institutionalized beyond the Sida programme?
19. How have the gender policies adopted by MaK been implemented at the university and followed up by the Gender Mainstreaming Directorate (GMD)?
20. Assess the efficiency of the management of the programme (including funds) at the GMD during the evaluation period.
21. Evaluate the work of the coordination office (DRGT) following up implementations of the GMD's Swedish program. Particularly compare GMD Activity Plans and Budgets with Annual Progress Reports. Have any discrepancies between these documents been monitored, and documented, including financial consequences? Assess any follow-up to such discrepancies, if any.
22. Assess the effectiveness and value of the Program Implementation Committee (PIC) and the Sida Steering Committee for the program. Suggest possible improvements.

[25] ASSESSMENT OF APPLICATION FROMMAKERERE UNIVERSITYCONTINUED BILATERAL RESEARCH COLLABORATION WITH UGANDA1 JANUARY 2010 TO 30 JUNE 2014.

23. Assess the effectiveness of MaK- the four public partner universities' relations, particularly concerning actual benefit and ownership of the program.
24. Describe changes in the University strategies and priorities for research and research training, and ways in which the research cooperation may have contributed to strategic long term transformation and change.

Impact

25. Assess to what extent the programme has contributed to improved research capacity at MaK and in Uganda. Have a critical mass of competent researchers in targeted research areas been created? In which specific fields? To what extent?
26. In which way has the research program had an impact on policy, collaboration with ministries, industry and civil society? Give examples.
27. Assess the collaboration MaK-Swedish partner universities based on communication/scientific partnership/mutual project ownership. Suggest possible improvements.
28. What impact has the research program had on the Swedish partner universities? Could the Swedish partner universities play additional roles within the program or collaborate in a different way?
29. How has the program increased capacity to formulate research problems and proposals? Describe the role and impact of the College (previously Faculty) Funds, and propose future possible changes.
30. Have support been given in a way that enhances innovative processes and innovative thinking within MaK, the partner universities and stakeholders? Are there proofs of innovative ideas or ways of working that have emerged during this program?
31. Describe MaK developments with regard to produced scientific innovations and links to private sector development and private-public partnerships.

Sustainability

32. Assess the sustainability of research and research training at MaK when the Swedish research cooperation program supported by Sida ends. What is the current planning for sustainability in research capacity building when support is phased out?
33. To what extent have regional (Africa) and international long-term research collaborations been established? Have Ugandan and Swedish researchers within the program benefited from them?
34. In what areas does MaK have all preconditions, e.g. critical mass of supervisors, courses, infrastructure and management capacity to shift from the sandwich model to massive in-house postgraduate training?
35. Assess the coordination office's (DRGT) efficiency in coordinating the Swedish research program during the evaluation period, 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 Sida phases in the program (incl. management routines).

36. Evaluate how the units part of the Swedish program perceives the work of the DRGT with regard to the program.
37. What are the main bottlenecks for development of research capacity within MaK, such as ICT, salary issues, procurement, etc.?
38. Does MaK 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 Swedish Embassy and MaK 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 Sida's support to research at MaK since year 2000, with focus on the evaluation period?
- How can the present research cooperation with Uganda be improved and made more efficient with regard to overall goals, financial/research management, program coordination, and scientific goals?
- How can the research cooperation's contribution to viable and sustainable research environments be further improved?
- How can donor support to research at MaK be harmonized to ensure a better research environment at MaK, and avoid duplications?
- How can the program be designed in order to encourage innovative processes with partners, in order to support new ideas of working and critical thinking?
- How can the Swedish partner universities be better utilised/drawn upon in innovative and sustainable ways within the program?
- How can the link between research result uptake/innovations and public-private partnerships/private sector development be strengthened? Which role should Sweden/Sida play?
- How can Sweden/Uganda cooperate in the improvement of supervision of PhD students?
- How could the system for quality control of the local postgraduate programs be improved?
- How can the overall coordination of the program at MaK be improved, and timely implementation of the program be ensured?
- Should the cross-cutting PhD courses continue in the current set up and should they continue to be funded by Sweden?

- How can the Demographic Surveillance Site's future be secured in a sustainable way? What should the role of Sweden as a donor be – if any?
- How can the role of the 4 regional public partner universities be strengthened in the program, and their active collaboration be ensured?
- How can MaK as a key research university in Uganda play a role in strengthening the Uganda higher education and research systems?
- 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; PhD students; staff; the Steering Committee) should be consulted. The Evaluation Team should describe the groups 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 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 Uganda and Sweden
- 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. Work plan and schedule

Activity	**Period / Point in time**	**Whom**
Contracting of evaluation team/content analysis of documents	18/2 – 18/3 2014	Embassy and Evaluation team
Inception report presented to Embassy and MaK	18/3 2014	Evaluation team
Approval of Inception Report	21/3 2014	Embassy
Field work Sweden/Uganda	21/3-16/5 2014	Evaluation team
Draft evaluation report to be presented to Embassy and MaK	20/5 2014	Evaluation team
Comments to Evaluation team	26/5 2014	Embassy
Revised evaluation report to be submitted to	2/6 2014	Evaluation team

Embassy		
Possible further comments to Evaluation team	5/6 2014	Embassy
Final evaluation report submitted to the Embassy.	11/6 2014	Evaluation team

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 Swedish Embassy, Kampala, and to Makerere University/Director DRGT, no later than May 20, 2014. 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 Swedish Embassy, Kampala, no later than June 11, 2014, 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, 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.

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

9. Evaluation team

The team must include a Team Leader. The team should include persons with:

- Knowledge of sustainable research capacity building
- Knowledge of research management/institution building
- Knowledge of gender policy and gender mainstreaming issues
- Knowledge of academic contexts and circumstances in Africa

Annex 2: People Met

Makerere University

Alnaitwe, Henry, Supervisor infrastructure, College of Engineering, Design, Art and Technology
Amito, Hellen, Christine, PhD student under GMD
Arikosi, Gilbert, Senior Programme Officer, Quality Assurance Directorate
Arinaitwe, Kenneth, Ph.D. Student, Chemistry Department, CONAS
Atekyereza, Peter, Sociology Department, CHUSS
Barageine, Justus Kafuko, PhD Student, CHS
Biphomanga, Joseph, PI Engineering Materials, College of Engineering, Design, Art and Technology, CEDAT
Birevu, Muyinda, Paul Senior Lecturer & Post Doc researcher
Bwana, Charlse, Dean School of Social Sciences CHUSS
Bwanika, Gladys, Senior Lecturer & Post Doc researcher, CoNAS
Byaruhanga, Joseph K. Mechanical Engineering Department, CEDAT
Ddumba-Ssentamu, John; Professor, Vice Chancellor
Erume, Joseph, Supervisor, COVAB
Galiwango, Edvard, Site Operations Coordinator, Iganga Mayuge Health Demographic Surveillanc e Site
Gasanzwe, Ancilla, Masters Student under GMD
Guwatudde, David, Interim Executive Director ,Iganga Mayuge Health Demographic Surveillance Site
Ikwap Kokas, PhD Student, COVAB
Kaki, Mirian, Librarian, Ph.D. student
Kakoza, Lydia, Masters Student under GMD
Kamaoga, Omar, Ph.D. student, College of Engineering, Design, Art and Technology
Kanabahita, Catherine, Director Gender Mainstreaming Directorate & sub-program coordinator
Karungi, Jeninah, Asst. Coordinator, CAES
Kiggundu Ssali, Paul, Accountant, Gender Mainstreaming Directorate,
Kirabira, John Baptist, Researcher/Engineering materials, College of Engineering, Design, Art and Technology, CEDAT
Kirumira, Edward Principal College of Humanities & Social Sciences (CHUSS)
Kitumba, Frank; Director, ICT Support (DICTS)
Kobusingye, Caroline, Librarian & MSc student
Kyakuwa, Betty, Communication Officer, College of Engineering, Design, Art and Technology, CEDAT
Kyomuhendo, Swizen, Department of Social Work and Social Administration
Lajul, Wilfred, Chair, Department of Philosophy
Mango, Magero, John; Professor, Deputy Principal, College of Natural Sciences
Masembe, Charlse, Senior Lecturer & Post Doc researcher, CoNAS
Mayega, Nakayiwa, Florence, Director, Planning and Development Department
Mayenga, Roy William, PhD Student, CHS
Mbogga, Michael S, Senior Lecturer & Post Doc researcher

Mpairwe, Denis, Department of Agricultural Production
Mugabe, Nestor, Program Administrator Sida, Directorate of Research and Graduate Training
Mugabe, Samuel; End-User Support Manager, DICTS
Mugimu, Christopher, Associate Professor, Department Chair, Department of Philosophy
Mugisha, J. Y. T., Ag. Deputy Vice Chancellor Academic Affairs & Principal CoNAS
Muhammed, Ntale, Head of Department, Chemistry, CONAS
Mukadasi, Buyinza; Director, Research and Graduate Training
Mukiibi, Stephen, Researcher, College of Engineering, Design, Art and Technology, CEDAT
Musali, K .Paul, Lecturer & Post Doc researcher, CAES
Musinguzi, Moses, Dean School of the Built Environment, College of Engineering, Design, Art and Technology, CEDAT
Mwesigwa, Andrew, Librarian, Digitization Section
Nakayiwa, Florence Mayega; Director, Planning and Development
Nakileza, Bob, Department of Geography
Nalule, Deborah, Ag. Bursar
Namalwa, Justine, Senior Lecturer & Post Doc researcher
Nankya, Mwebe, Maria, II Librarian, M.Sc. student
Nasinyama, George, Directorate of Research and Graduate Training
Nawangwe, Barnabas, DVC Finance and Administration, College of Engineering, Design, Art and Technology
Ndemere, Peter, Executive Secretary UNCST & Deputy Chairperson SIDA Program Steering Committee
Ngobi, Robert, Manager, Quality Assurance Directorate
Ntale, Muhammad; Head of Department, Chemistry
Nyachwo, Frances, Asst. Coordinator, Gender Mainstreaming Directorate
Okello, Owiny, David, Dean and Sub program coordinator, COVAB
Okure, Mackay, Coordinator, College of Engineering, Design, Art and Technology
Okwee-Acai James, Lecturer & Post Doc researcher, COVAB
Olupot, Peter, Researcher/Engineering materials, College of Engineering, Design, Art and Technology
Oryem-Origa, Hannington; Professor, Biological Sciences
Rukooko, A. Byaruhanga, Dean, School of Liberal and Performing Arts
Savino, Biryomumaisho, Lecturer & Post Doc researcher, COVAB
Ssembatya, Vincent, Director, Quality Assurance Directorate
Ssenku, Jamil Ph.D. Student, Biological Sciences, COMAS
State, Liz, Senior Librarian, Ph.D. student
Tumwine, James K. Coordinator College of Health Sciences, CHS
Turinawe, Alice, PhD student and Asst. lecturer, CAES
Twinomuhangi, Prevocatus, Lecturer & Post Doc researcher, CAES
Wamala, Dan, PhD Student
Wamala, Edward, Department of Philosophy
Yiga, Solomon Ph.D. Student, Chemistry, CONAS
Ziraba, Yasin, Naku, Team leader, Innovation and Clusters Programme, College of Engineering, Design, Art and Technology

Others
Andama, Edward, Dean, Faculty of Science and Education, Busitema University
Gabona, Elizabeth, Director Higher, Technical, Vocational Education and Training, Ministry of Education and Sports
Habinka B., Annabella, Directorate Institute of Computer Science, Mbarara University of Science and Technology
Kadoodooba, Byaruhanga, Dean. Graduate School, KyambogoUnoversity
Mabweijano, Mary, Senior Advisor, Royal Norwegian Embassy
Onapa, Maxwell Otim, Deputy Executive Director, National Council for Science and Technology.
Opiyo, Elizabeth, Director, Institute of Graduate Studies, Gulu University

Sweden
Espling, Margareta, Senior Lecturer, University of Gothenburg
Hansson, Henrik, Associate Professor, Stockholm University
Magnusson, Ulf, Professor, Swedish University of Agricultural Sciences
Persson, Kristina E.M., Associate Professor, Karolinska Institutet
Roth, Peter, International Science Programme, Uppsala University
Werner, Inga Brittt, Professor, KTH
Wredle, Ewa, Associate Professor, Swedish University of Agricultural Sciences

Annex 3: References

Makerere University documents

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Self Assessment Report, October 2013
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Sida programme documents

Agreed Minutes Annual Planning Meeting April 2012
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Annex 4: Results Matrix Data

(A) BACKGROUND INFORMATION MAKERERE UNIVERSITY

- Total number of B.Sc./M.Sc. students (men/women):

Academic year	Number of registered students								
	Undergraduate			Post graduates			Grand Total		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
2013/14	15,304	18,478	34,629	741	1,251	1,992	16,045	19,729	36,621
2012/13	15,825	19,582	35,407	704	1,151	1,855	16,006	20,647	37,262
2011/12	15,302	19,496	34,798	840	1,491	2,331	16,665	21,073	37,129
2010/11	14,135	17,659	31,794	686	989	1,675	14,821	18,648	33,469
2009/10	14,116	17,491	31,607	601	904	1,505	14,717	18,395	33,112

Source Fact books: 2013/14, and Fact book 2012/2013,
N.B Postgraduates include Masters and Post Graduate Diplomas

On average the proportion of female students registered over the three year period 2011/12 to 2013/14 was 44% and 37% for undergraduate and postgraduate respectively

- Total number of academic staff (men/women) (include breakdown between staff positions if available):

Academic Rank	Full time academic staff					
	2009/10			2013/14		
	Female	Male	Total	Female	Male	Total
Professor	3	42	45	9	75	84
Associate Professor	14	70	84	23	110	133
Senior Lecturer	45	133	178	51	130	181
Lecturer	94	257	351	121	278	399
Assistant lecturer	128	244	372	177	390	567
Total	**284**	**746**	**1,030**	**381**	**983**	**1,364**
Teaching assistants	**98**	**199**	**297**	**32**	**81**	**113**

Source fact book 2009/10 and 2013/14

- Total number of academic staff with Ph.D.s (men/women):

Academic year	Number of staff with PhDs		
	Female	Male	Total
2013/14	156	485	641
2009/10	80	274	354

Source: Fact book 2009/10; Planning and Development Department Makerere University
NB Figures do not include the teaching assistants

- What/number of faculties/institutes:

Makerere University operates a Collegiate Mode of governance with 9 Constituent Colleges and one School, operating as semi-autonomous units of the University. In total there are twenty six (26) schools and two institutes. The total number of departments is ninety seven (97) and two centres.

College of Natural Sciences (CONAS) -two schools and five departments
College of Business and Management Sciences (CoBAMS),- three schools with eight departments
College of Computing and Information Sciences (COCIS)-two schools with six departments
College of Engineering, Design, Art and Technology (CEDAT) – three schools with nine departments
College of Humanities and Social Sciences (CHUSS) - five schools, & sixteen departments.
College of Agricultural and Environmental Sciences (CAES) - three schools with nine departments.
College of Education and External Studies (CEES) - three schools with five departments.
College of Health Sciences (CHS) – four schools with twenty seven departments.
College of Veterinary Medicine, Animal Science and Bio-Security (COVAB) - one school with eight departments.
School of Law with three departments.

- Total budget for the university 2013/2014

University Budget FY 2013/14 UGX 209billion

- Total budget allocated for research:

No specific budget line.

- Sources of funds:

Year	Consolidated budget				Total expenditure
	Revenue by sources of funds in UGX				
	Government recurrent funding	Private funding	Donor operational budget	Total funding	
2012/13	75,777,000,000	99,137,839,441	8,008,000,000	182,323,000,000	182,174,000,000
2011/12	55,529,108,711	92,350,459,482	4,299,581,884	152,179,150,077	148,072,022,045
2010/11	44,505,104,846	78,298,025,833	9,953,984,582	132,757,115,311	146,750,556,983
2009/10	44,952,151,664	67,410,156,341	5,788,765,456	118,151,073,461	148,346,202,332

- Is there a research policy/strategy in place in your university?

March 2008 Research and Innovations Policy

(B) DEVELOPMENT OF HUMAN RESOURCES

Research outputs

- How many PhDs graduated (2010-2014) at your university?

Year of graduation	Number of PhDs who graduated at the university					
	Overall			With Sida support		
	Women	Men	Total	Women	Men	Total
2014	11	40	51			
2013	11	50	61			6
2012	12	30	42			6
2011			55			3
2010			39			3

Source Fact book 2013/14, Fact book, 2012/13, fact book 2009/10, Graduation book January 2014; Final Sida report to Swedish Embassy by George Nasinyama.

- How many students initiated PhD training at your university's PhD programs in the same period (men/women)?

Year	Number of Masters and PhD students			
	Masters		PhD	
	Overall	Sida support	Overall	Sida support
2013/14	1829	59	546	82
2012/13	1774	67	554	100
2011/12	2203	48	552	102
2010/11	1446	28	202**	93
2009/10	1319	17	151**	89

Source: Overall figures are from Fact books 2013/14, 2012/13, 2011/2012 while Sida figures are from Final Sida report to Swedish Embassy by George Nasinyama
NB: The reported student enrolment under Sida during any given year is a build up from preceding year. The figures for 2013/14 depict the number of students still on the programme

- Has the number/ percentage of staff members with PhDs increased since 2010?

Sex	Number of staff with PhDs					
	2013/14			2009/10		Total
	No with PhDs	Total	Percent	No with PhDs	Total	Percent
Female	156	381	41	80	284	28
Male	485	983	49	274	746	37
Total	641	1364	47	354	1030	34

- What thematic areas have been supported with Swedish funds?

Unit	**Research Focus**
College of Agriculture and Environmental Sciences	Developing sustainable agricultural production systems through ecological resource management and value addition
College of Humanities and Social Sciences	Enhancing capacities and capabilities in the humanities for sustainable livelihoods
National and local responses to transformation for sustainable development	

College of Health Sciences	To consolidate and enhance the research profile of the MUCHS and the University and, to enhance transformation and utilization of research knowledge and innovations
College of Natural Sciences	Enhancing Capacity in Basic Science Research and Training for Sustainable Development
College of Engineering Design Art and Technology	Sustain Technological Development in the Lave Victoria Region
College of Veterinary Medicine	Capacity Building in Livestock Biotechnology, Production & Ecosystem Health towards Improving Livelihoods in Uganda‟s Cattle Corridor and Northern Region
Research support under the Sida collaborative programme	
Directorate of Research and Graduate Training	To improve SGS capacity to efficiently and effectively coordinate & manage Makerere University research programme supported by Sida to enhance strategic research and innovations for sustainable development
Directorate of Information and Communication Technology	Leveraging Makerere ICT services for research enhancement
Quality Assurance	The overall goal is to develop institutional capacity for quality assurance training and facilities to provide better and effective graduate training and research.
Library	Further Integration of ICTs in Makerere University Library Functions to Enhance Research
Gender Mainstreaming	Enhancement of academic and professional competences of female staff in public Universities and the generation of gender focused research for national development.

Evaluation of the Swedish government funded research cooperation support to Uganda

This report contains the findings, conclusions and recommendations from an evaluation of Swedish research cooperation with Uganda, which was initiated in 2000. The purpose of the evaluation was to analyse, assess, generate knowledge and provide lessons from the research cooperation. The evaluation covers the bilateral research cooperation programme with MaK and the four regional partner universities during the period 2010 to 2014 including the students carried over from the previous period.

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