



Tracing research capacities in Tanzania

A study of Tanzanian PhD holders trained within the Tanzania – Sweden Research Cooperation.



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Cover photo: Malena Rosman

“A Senior Lecturer/Researcher from the Institute of Marine Sciences, UDSM, Zanzibar talking to local communities on how to develop and improve marine value added products in sustainable manner.”

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ABBREVIATIONS AND ACRONYMS

ARU	Ardhi University
CoET	College of Engineering and Technology
CoNAS	College of Natural and Applied Sciences
CoSS	College of Social Science
COSTECH	Tanzania Commission for Science and Technology
EAC	East African Community
FYDP	Five Year Development Plan
GDP	Gross Domestic Product
ICT	Information Communication Technology
IKS	Indigenous Knowledge Systems
IMF	International Monetary Fund
ITP	Institutional Transformation Programme
KI	Karolinska Institutet, Stockholm
KTH	Royal Institute of Technology, Stockholm
M&E	Monitoring and Evaluation
MKUKUTA	Swahili acronym for Tanzania's National Strategy for Growth and Poverty Reduction
MoCST	Ministry of Communication, Science and Technology
MUCHS	Muhimbili University College of Health Sciences
MUHAS	Muhimbili University of Health and Allied Sciences
NFAST	National Fund for the Advancement of Science and Technology
R&D	Research and development
SADC	Southern Africa Development Community
SAP	Structural Adjustment Program
SAREC	Swedish Agency for Research Cooperation
Sida	Swedish International Development Agency
STI	Science, Technology and Innovation
SU	Stockholm University
SUZA	State University of Zanzibar
TOR	Terms of Reference
UCLAS	University College of Land and Architectural Studies
UDBS	University of Dar es Salaam Business School
UDSM	University of Dar es Salaam
UNDP	United Nations Development Program
URT	United Republic of Tanzania
UTAFITI	Tanzania's National Research Council (before COSTECH)
WTO	World Trade Organization

EXECUTIVE SUMMARY

Science, technology and innovation are considered key drivers for a country's economic growth and prosperity and universities play a central role in achieving this. In many low income countries, however, universities have not been able to shoulder this responsibility without external support. The rationale for Swedish support to research has been that each country needs at least one public university that can produce essential analytical competence and high quality research. Most of Swedish support to research capacity building over the years has focused on PhD training, with the aim to build a critical mass of academic staff who can conduct high quality research and eventually be able to train their own researchers.

The Swedish research cooperation with Tanzania dates back to 1977 and while the cooperation program has continuously been evaluated with regard to the institutional capacity obtained, there has been little or no focus on the capacities and development of individual Tanzanian researchers.

This study examines the career path of Tanzanian researchers who have completed their PhD degrees within the research program, and identifies factors that have influenced their choices¹.

150 Tanzanian PhD holders who completed their PhD training during the period 1981-2013 were identified and traced². The main method was a web-based, self-administered questionnaire sent to all traced researchers. The response rate was 68% or 102 individuals (26 women and 76 men). In addition to the survey, 37 interviews (12 women and 25 men) with Tanzanian PhD holders/supervisors were conducted in Tanzania during three weeks in February 2014.

The majority of the respondents (86%) had followed the "sandwich model" approach for PhD training, dividing their time between a university in Sweden and their home institution. After PhD graduation, regardless of gender and academic discipline, the large majority (93%) have remained at their Tanzanian universities as members of academic staff. They have all continued with research, teaching and public service/ consultancies, which are the three types of work academic staff at these universities ideally should perform. The findings indicate that this model of PhD training is highly successful in terms of retaining staff at the home university.

¹ The University of Dar es Salaam (UDSM) was selected as a key partner for Swedish research cooperation with Tanzania. Later on two colleges at UDSM became independent universities (MUHAS and ARU) and were also included in the research cooperation.

² No PhD holders who had initiated their PhD training before 1981 were identified.

Women have in general not achieved as high positions as men at the universities and they also expressed more dissatisfaction with the amount of time they could allocate to research, something which they attributed to heavy teaching loads but also to the fact that they have the main responsibility for their families. The willingness to conduct research expressed by both women and men seemed often constrained by a shortage of funding and time.

Despite these problems a large majority of the PhD holders (86%) reported that they are deeply engaged in research of direct relevance to poverty reduction and the development of Tanzania. A large percentage (90%) of both women and men stated that they work in their expert area today using the knowledge and skills they obtained through their PhD training. This is indeed positive findings and in line with the overall objectives of the research cooperation.

There is evidence that high quality research is carried out by the trained PhD holders, but more resources and adequate funding are needed for the researchers to continue with important research after their PhD completion. PhD training is basically an education for future research and lack of research funding is a serious obstacle to continued research. Hence, support to research at post doc level should also be part of future Swedish support.

There is still a need for support to PhD training since there is a shortage of highly trained academic staff at Tanzanian universities today. This has partly to do with a huge intake of students at undergraduate level at the universities in later years, leading to that the current academic staff is overworked with heavy teaching loads at the expense of conducting research.

Monitoring and evaluation (M&E) are necessary tools to inform decision-making, for accountability and institutional learning. Such tools have been weak or missing in the research cooperation program in Tanzania. This tracer study is the first of its kind in Tanzania despite many years of research collaboration. The program needs a much stronger M&E framework which can provide knowledge and ideas on how to best contribute to strengthen research environments in order to create sustainable research systems.

Acknowledgement

Many people have contributed to this study. The author wish to express her heartfelt gratitude to the many Tanzanian PhD holders, Tanzanian and Swedish supervisors and key people at the involved Tanzanian universities who generously contributed their time to complete the questionnaire, discuss research and even assist in finding

the PhD holders. For a while the study had the character of a “chaser” study rather than a “tracer study”, as it was difficult to locate some of the PhD holders and get their current contact information. Without valuable contributions from supervisors and coordinators, this study would not have been possible. The author also wish to thank The Swedish Embassy in Dar es Salaam and Sida staff members who have contributed intellectually, discussing both the design of the study and giving feed-back all along in the process of finalizing the report.

1. BACKGROUND AND PURPOSE

Sweden has for almost forty years been supporting research and research training of particular concern for addressing poverty and promoting sustainable development in low-income countries. The Swedish ambition has been to support at least one public researching university in each country to cater for and eventually become a resource for the creation of a more extended university system and for national innovation systems.

The Swedish engagement in bilateral research cooperation has been a learning process. The first 10 years from its start in 1975 could be characterized by support to national research councils³. An evaluation of this period showed that in most cases, these bodies lacked the capacity to make priorities of research based on scientific criteria. A countermeasure during the next period was to strengthen research capacity through research training using the so-called “sandwich model”, which is still in use. This modality differs from the ordinary research scholarship systems that detach the student from the local context for several years. In the sandwich model training the students spend time at Swedish universities for coursework, analysis and writing-up, while the empirical research is formulated with a local perspective and with data collected from the local context in the student’s home country. The home-based research also brings research activities to the local university, along with laboratory equipment, library and ICT facilities which can support continued research. After graduation the PhD holders are expected to continue work at their local university and form the core of research staff who

can develop postgraduate programs and train doctoral students in their own country.

The overall objective of the Swedish support to research in Tanzania is aligned with Tanzania’s National Strategy for Growth and Poverty Reduction (MKUKUTA) that calls for development of the human resources and improvement on the availability and efficient use of knowledge, research and technology as tools for increased productivity and reduced poverty.

In 1995 University of Dar es Salaam (UDSM) was selected as a key partner for the research cooperation. Since 2007 two new universities branched off from UDSM, Ardhi University (ARU) and Muhimbili University for Health and Allied Sciences (MUHAS) and were included in the research cooperation as well.

Swedish support has over the years mainly focused PhD training, but also on strengthening institutional capacity for research management and the development of reforms. While the overall support to research cooperation with Tanzania has been and is continuously evaluated⁴, little attention has been paid to individual researchers and their careers after completing their PhD degrees. This tracer study in Tanzania is the second⁵ of its kind in order to examine the career development of the PhD holders, and to assess if the methods used have been effective in achieving the objectives of Swedish research cooperation.

The purpose of the tracer study is according to the ToR three-fold:

Identify the career paths of the students that have initiated studies on a research training program supported by Sweden and identify factors that have influenced the student’s choices.

Identify lessons learnt from the Sida/SAREC research cooperation and suggest how this support can be improved.

Suggest how Tanzanian universities and Sida, systematically, could monitor/trace the progress of PhD holders who have received Swedish research support.

³ From 1975-1995 Swedish support to research was handled by SAREC (Swedish Agency for Research Cooperation with developing countries). SAREC was an independent agency under the Swedish Ministry of Foreign Affairs until 1995 when it merged with three other development cooperation agencies to form the new Swedish International Development Cooperation Agency (Sida).

⁴ Boeren A., et al: Sida/SAREC Bilateral Co-operation: Lessons Learned. Sida Evaluation 06/17; Hyden, G. University and Faculty Research Funds at universities in Mozambique, Tanzania, and Uganda. Sida Evaluation 06/23. Self-Evaluation of the Sida/SAREC Bilateral Research Cooperation Program: 1998-2008. Report of a workshop on analysis of achievements and impacts of Sida/SAREC-supported projects at MUCHS, Bagamoyo January 2007 Svensson,A. 30 years of Swedish-Tanzanian Research Co-operation. 2007, Sida

⁵ The first tracer study was carried out in Vietnam 2009

Gender aspects should also be taken into account: the number of women and men who have been studying on the training programs and how gender aspects have influenced their career paths.

The focus of this study is thus on Tanzanian PhD holders who have participated in research training programs within the Tanzania-Swedish cooperation. It is an assessment, partly a self-assessment of the PhD training and career paths of individual PhD holders. It is not an evaluation of the research cooperation as such⁶. Research output measured in numbers of publications, assessments of national research systems and the development of institutional research capacity as well as how Swedish support to research have changed over the years and the underlying economic and development theories and policies leading to these changes, are not included in the study⁷.

⁶ An Evaluation of the overall Swedish Research cooperation with Tanzania 2009-2013 has just been completed by SIPU international.

⁷ A recent PhD thesis from Linköping University, 2013: Aiding science. Swedish research aid policy 1973-2008, by Veronica Brodén Gyberg is an interesting account of how Swedish support to research capacity building have changed over the years.

2. TANZANIA – GENERAL CONTEXT

Some basic facts

Tanzania has experienced two major transitions in 50 years. The first was at independence and the formation of the United Republic of Tanzania. Tanganyika received its independence from the United Kingdom (UK) in 1961 and Julius Nyerere became Tanganyika's first president in 1962. Zanzibar received its independence from the UK in 1963, as a constitutional monarchy under the Sultan. In April 1964 Tanganyika united with Zanzibar to form the United Republic of Tanganyika and Zanzibar and on October 29 of that year the country was renamed the United Republic of Tanzania. The Republic's first president Julius Nyerere, believed that multiple political parties, in a nation with hundreds of ethnic groups, were a threat to national unity and therefore sought to ensure a one party system. To further his aim for national unity Nyerere established Kiswahili as the national language. After independence Tanzania opted for a socialist model for development which president Nyerere called African Socialism, or Ujamaa, literally meaning 'family-hood'.

Although pursued with the best of intentions, the centrally planned economy did not bring development and prosperity to the people.

The second major transition, beginning in the middle of the 90's involved integration into the global economic and political systems through a shift from the centrally planned economy to a liberalized, private sector-led market economy. The one-party rule came to an end in 1992 with the first multi-party democratic elections held in 1995. In December 2005, Jakaya Kikwete was elected the 4th president of Tanzania. President Kikwete was re-elected in 2010 and is still in power.

Since 2000, reversing decades of decline, Tanzania has made substantial progress in terms of macro-economic stability and structural economic reform⁸. Tanzania's GDP growth rate has been impressive in recent years. Since 2005 the annual growth rate average 7 percent⁹. Tanzania is a member of the World Trade Organization (WTO), and of two regional trading blocs: Southern Africa Development Community (SADC), and East African Community (EAC).

Despite these positive developments, Tanzania remains one of the poorest countries in the world. According to the 2011/12 Household Budget Survey, the levels of poverty have only been reduced from 36 percent in 2000/01 to 28 percent in 2011¹⁰. The poverty in rural areas is much higher (33.3%) than in urban areas (21.7%).

Tanzania has a population of 48 million (2013 est.) and a per capita income of about 570 USD¹¹ (2012). The economy is heavily dependent on agriculture, a sector identified as a cornerstone for growth and poverty reduction, as 80 percent of the population depends on agriculture for survival. Agriculture is still dominated by small-scale farmers¹². Main environmental concerns in Tanzania include problems with desertification, deforestation, coastal and marine environments and urban settlements. Without due attention to the environment the development of Tanzania will be unsustainable.

Tanzania's overriding goals for development was formulated in the Vision 2025 and enshrined in the National Strategy for Growth and Reduction of Poverty

⁸ Poverty and Human Development report 2007, MKUKUTA, Monitoring system. Ministry of Planning, Economy and Empowerment

⁹ National Strategy for Growth and Reduction of Poverty II, (MKUKUTA II) Ministry of Finance and Economic Affairs, July 2010.

¹⁰ United Republic of Tanzania. Tanzania Household Budget Survey 2011/12, press release 14 Nov. 2013

¹¹ <http://data.worldbank.org/country/Tanzania>

¹² MKUKUTA II, 2010

(NSGRP) or in Kiswahili MKUKUTA from 2005 and the MKUKUTA II from 2010. The vision makes higher rates of growth the central aim for national development and considers Science, Technology and Innovation (STI) the basis for sustainable economic growth and prosperity through increased productivity and competitiveness and creation of employment opportunities¹³. MKUKUTA calls for strengthening of the education sector, particularly the expansion of the higher education (HE), science, research, technology and innovation capacity.

The implementation of MKUKUTA I, recorded considerable improvements in the delivery of social services – notably in education, health, water, sanitation and social protection. The investments in education and health in the recent past have enabled Tanzania to make improvements on the Human Development Index (HDI) ranking from position 163 in 2000 to 152 in 2012¹⁴.

A Five Year Development Plan (FYDP I) was launched in 2011 with the aim of transforming Tanzania into a middle-income country by 2025¹⁵. Five core priorities have been targeted under the Plan's strategy to unleash Tanzania's latent growth potentials. They include: (i) infrastructure; (ii) agriculture; (iii) industrial development; (iv) human resource and skills development, with an emphasis on science, technology and innovation; and (v) tourism, trade and financial services. Development of science, technology and innovation capabilities are seen as critical in bolstering the country's competitiveness. ICT will play a crucial role in the transformation process from a resource-based to a skills- and technology-based economy in order to transform the country's production structure.

The adult literacy rate is 72.6 percent¹⁶. Life expectancy has increased from 44 years in 2001 to 60 years in 2013, mainly due to a decline in HIV prevalence and improved child survival. However, malaria, TB and HIV/AIDS continue to affect Tanzanians in many dimensions. During 2011/12, malaria prevalence in children (6-59 months of age) averaged 9 percent (10% in rural areas and only 3% in urban areas). The HIV/AIDS pandemic is despite a decline in prevalence still perhaps the greatest threat against development efforts in Tanzania at national, community and individual levels. According to the data from Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) 2011-2012,

the national prevalence among sexually active populations (between 15-49 years of age) is 5.1 percent which means that approximately 1.4 million people are living with HIV/AIDS in Tanzania¹⁷. National efforts to address the problem were scaled up under the National Multisectoral Strategic Framework (NMSF) on HIV/AIDS, but there are still much more to do.

Brief overview of higher education and research in Tanzania

Tanzania's education system consists of two years early childhood education, seven years primary education, four years junior secondary, two year senior secondary (A level) and three or more years of university or tertiary education.

The higher education system has grown from a relatively simple to a complex one. At independence there was only one institution of higher education (a university college) and until the late 1980's there were only two public universities in the country and education was free. In the early 1990's cost sharing in higher education was introduced due to the economic crisis during this period which reduced the government's financial support to the sector. The cost sharing was also part of wide-ranging economic and social reforms under the IMF/World Bank sponsored structural adjustment programs (SAPS). The implementation of cost-sharing was in three successive phases, the first being in 1992/93, the second in 1993/94 and the third in 2005. In 2005 the government introduced an interest free student loans system. Under this scheme all university students, including those from the private universities are eligible for loans. The provision of loans are based on the applicants' academic performance¹⁸.

Tanzania has in recent years been experiencing a fast growth of tertiary institutions and in 2010 there were 31 Universities and University Colleges (of which 11 are public universities and 20 private) in the country. However, most of the newly established universities and colleges have very little research activities in the fields of science and technology, partly due to heavy capital investments needed to acquire the necessary infrastructure and human resources and partly due to a general decline of interest by students for science, engineering and technology courses. Recent admission trends of the universities have indicated that increasingly more candidates with science combinations opt to study commerce, law and other non-natural science disciplines. There is

¹³ MKUKUTA, 2005

¹⁴ Human development Report 2013, UNDP

¹⁵ The Tanzania Five year Development Plan, 2011/12-2015/16. Unleashing Tanzania's latent growth potential, URT, Presidents Office, Planning Commission 2011

¹⁶ Tanzania National Bureau of Statistics, 2013

¹⁷ Tanzania HIV/AIDS and Malaria Indicator Survey 2011-2013

¹⁸ Msolla P (2007). Issues of Higher Education, Ministry of Higher Education, Science and Technology.

also an erosion of mathematical skills, which makes it difficult for students to enroll in science and engineering. This is a problem for primary and secondary schools to address^{19, 20}.

A total of 117 000 students were enrolled in higher education in 2010, of which 75 percent were enrolled in the public universities²¹. The total enrolment of female students have grown from 7.5 percent in 2003 to 35 percent in 2010. Almost all universities have registered a significant increase in the enrolment of students during later years, with UDSM and the relatively new university of Dodoma taking the lead. Admission to public universities is however very competitive and is based on pass mark achievement on the Advanced Certificate of Secondary Education Examinations (ACSEE).

A National Policy on higher education was developed in 1999. It stemmed from a serious concern about the lack of a clear and consistent national policy on higher education provision in the country. The policy states that the education sector should be given priority in allocation of resources by the Government. Training and research objectives shall target the development and promotion of a strong indigenous base of science and technology to enable Tanzanians to solve their development problems. One of the strategies to reach this goal put forward in the Policy was to invest in education at the rate of 20 percent of annual Government expenditure (5 % of GNP) and into Research and Development (R & D) at a rate of 1% of GNP²².

Tanzania was the second country in Africa after Ethiopia to develop a National Science and Technology Policy in 1985. It was revised in 1996 to better fit the country's newly liberalized and privatized economy. The policy is currently (2014) being reviewed again to formulate the new National Science, Technology and Innovations (STI) Policy. The new policy, which will include Innovation, a component that was missing in the previous policy, is going to guide the nation towards more effective utilization of STI capacities and capabilities. In 2009 the Government separated the administration of higher education and research, incorporating higher education in the ministry of education and creating a new ministry for Communication, Science and Technology (MoCST) to raise the profile of research.

A National Research and Development Policy was formulated in 2010²³. The policy aims to develop a competitive knowledge economy which is skills-based, knowledge and innovation driven and thus capable of generating and sustaining dynamic development. Its purpose is to increase the contribution of research to the development of the country. The policy further emphasizes on innovation and commercialization of research results which are key in bringing about economic growth while at the same time solving societal problems. Total investment in R&D is between 0, 2% to 0, 4% of GDP²⁴ (the figures are disputed) and is dominated by donors, who contribute 52 percent of resources. However, the research climate is improving in Tanzania and support to research has lately become a focus in the development agenda of other agencies²⁵.

In January 2009 the president promised to allocate 1% of GDP to research activities as proposed in the 1999 National Policy on Higher Education and reaffirmed at the African Union Summit of Heads of States in January 2007. This unprecedented promise has created a pressure on the Tanzania Commission for Science and Technology's (COSTECH) research management and coordination role and as the principal advisory organ to the Government on matters pertaining to STI and their application for socio-economic development. COSTECH administers the National Fund for the Advancement of Science and Technology (NFAST) established in 1995 to provide research grants for the development of science and technology in national priority areas considered of social economic benefit to Tanzanian society.

²³ The National Research and Development Policy, MoCST, 2010

²⁴ Human Development Report 2013, UNDP

²⁵ DFID deployed £1 billion for research 08-13. OECD has put forward a policy for innovation and EC has declared 09 the year of innovation. The UN Economic and Social Council, Economic Commission for Africa recommended in May 2009 support to innovation, research and ICT as a premise for Africa's development.

¹⁹ Msolla, P(2007) *ibid*.

²⁰ The National Research and Development Policy, MoCST, 2010

²¹ Mgaya, Y.D (2010). Critical Success Factors in Higher Education Finance and Planning: an Institutional Perspective

²² National Higher Education Policy, URT, Ministry of Science, Technology and Higher Education, 1999

3. THE TANZANIA-SWEDEN RESEARCH COOPERATION

Swedish research cooperation with Tanzania started in 1977 with support to the National Research Council UTAFTI (now COSTECH). In 1985, an evaluation showed that academic capacity in the country was far too low, and that the council could not perform its functions. As from 1986, support to research capacity building focused mainly on individuals at universities, research institute and ministries²⁶. At the beginning of 1990s it became clear that such fragmented support could not contribute to the creation of sustainable research environments²⁷. Training of researchers had to be supplemented with investments in research infrastructure and scientific equipment. In 1995 Sida decided to concentrate the research cooperation to one university, the University of Dar es Salaam (UDSM), with the aim of contributing to the establishment of a coherent agenda for research and research training in Tanzania.

UDSM was established as a National University in 1970 and is the oldest university in Tanzania. It used to consist of 6 faculties, five institutes and two subordinated University Colleges, Muhimbili University College of Health Sciences (MUCHS) and University College of Land and Architectural studies (UCLAS). The Sida decision to concentrate on UDSM in 1995 was feasible as the university had started the “Institutional Transformation Programme” (ITP) to better manage the resources available for research and at the same time enhance the quality of teaching and research. UDSM is the largest public university in Tanzania and the total number of students has grown from about 3350 in 2003/04 to approximately 19,700 in 2010/11²⁸. The proportion of female students at undergraduate and post graduate level is about 42 percent. UDSM is the major research institution in the country and the postgraduate enrolment is kept at an average of 10 percent of the total undergraduate enrolment.

In 2007 the two university colleges MUCHS and UCLAS became independent universities: Muhimbili University for Health and Allied Sciences (MUHAS) and Ardhi University (ARU). Sweden has continued to support programs within these universities, which had been part of the former UDSM support. In 2010/11 the

total amount of donor support to UDSM was 42 percent of the operating budget²⁹ (the Swedish support represented 11 percent of the total donor support). Even at MUHAS the donor support amounted to 42 percent of the operating budget in 2010/11. The amount of donor funds at ARU was 9 percent in 2013³⁰.

The three universities are very different in size, mission and vision. UDSM is as mentioned the largest university (19 700 Students) in the country with many colleges, schools, institutes, centers and administrative faculties and it provides educational opportunities and workforce for many sectors of society. Muhimbili University of health and allied sciences (MUHAS) is a medical university, much smaller and with a clear health related mission of quality research and public service. MUHAS had a total of 2 695 students in 2010, with a female enrolment of 32.5 percent. It is focused on clinical and doctoral training programs that are often based on active publishing. Ardhi University (ARU) is also a smaller university focusing on design, architecture, engineering and planning and the mission of the university is to provide integrated teaching, research and public services that are geared towards achieving sustainable socio-economic development of Tanzania. A total of 3 195 students were enrolled at Ardhi in 2012, with a female enrolment of 30.8 percent³¹.

²⁹ Facts and figures 2010/11. UDSM

³⁰ Kruse, SE et al (2014). Evaluation of the Swedish Research cooperation with Tanzania 2009-2013.

³¹ Ardhi University, Facts and Figures 2011/12

4. METHODS USED IN THE STUDY

Several data collecting methods are used in the study, both quantitative and qualitative. The main method is a self-administrated web-based (online) questionnaire sent to all identified and traced PhD holders. The questionnaire was supplemented with semi-structured interviews of a selection of PhD holders and supervisors, both Tanzanian and Swedish. The interviews were designed to help interpret the quantitative data from the survey and to identify factors that had influenced the results.

The first task was to identify and trace the Tanzanian PhD holders. This was done by reading relevant documentation about the bilateral research cooperation from its inception in 1977 and by communicating via e-mails and telephone with coordinators and supervisors at the involved Tanzanian and Swedish universities. As far as could be understood from early documentation, no sup-

²⁶ Some larger research programs like the TANSWED program was initiated already in 1986.

²⁷ Sida/SAREC Bilateral Research Cooperation: Lessons learned by Ad Boeren et al. Sida Evaluation 06/17

²⁸ UDSM, Facts and Figures 2010/11. When taken into consideration that MUHAS and ARU became independent universities in 2007, the development at UDSM is even more impressive.

port to PhD training occurred before 1986 except for a few individuals who were given scholarships to pursue their PhD studies abroad.

Unfortunately there is no available information on the number of PhD holders who have been trained over the years. According to a self-assessment made in 2007, approximately 107 individuals (32 women and 75 men) had completed their PhD degree within the program³². The information of past and present PhD holders varied at the different departments and universities. Some had updated lists, including year of PhD completion, discipline and e-mail addresses. At other places the information was scanty – a name here, an e-mail address there. Since a web-based questionnaire relies on updated and correct e-mail addresses, the lack of such made the tracing more difficult. A recurrent problem was that many e-mail addresses bounced and moreover, several individuals turned out to have two or more e-mail addresses, one university e-mail address and one Gmail, yahoo or Hotmail address. Oddly enough the university e-mail addresses were less reliable than the private ones.

After removing inadequate information the total data set consisted of 150 identified and traced Tanzanian PhD holders. There is still a high number of PhD students (127 students) that are being supported within the program. The reason for not including them in this study is that they cannot report on any work or research activities after PhD completion. Most of them are expected to graduate in 2014-2016. Attempts were also made to find drop-outs or PhD students who had decided to finalize their studies at a lower academic level, but e-mail addresses to this category of individuals were not available. There is a possibility that there are only very few individuals in this category, since most PhD students were members of staff at the collaborating universities before beginning the PhD training.

The web-based questionnaire was developed in collaboration with the online research company Netigate. The purpose of the survey was to get basic knowledge of the PhD holder: age, gender, degree (or drop out), year of PhD completion, subject area, and career path after ending the program and current position. All questions except one were closed (multi-choice) questions. Closed questions mainly address issues which can be quantified, while open questions are designed to get additional information about the researcher's views and perceptions. The questionnaire questions were sent to the responsible officer at the Swedish Embassy for approval and further suggestions. After adding suggestions given by the officer, the questionnaire was piloted on a few individu-

als in Tanzania. It became clear that one question had a faulty setting and after correcting that, the questionnaire was sent to all individuals on the list. An introductory letter was sent with the survey, explaining the purpose of the study. (The complete questionnaire form is found in annex 2).

The questionnaire was self-administered by the PhD holders and may be viewed as a form of self-assessment. According to the literature on research methods, one of the advantages with self-administered surveys is that respondents can report critical and undesirable issues more easily than they do in face-to-face interviews. Another advantage of self-administered surveys is that all respondents gets the same questions and there is no worry about interviewer bias³³.

In addition to the questionnaire semi-structured interviews were carried out. Those who were selected for interview can be divided into three groups: 1) Tanzanian PhD holders, many whom are also supervisors and department heads/coordinators today; 2) Swedish supervisors and 3) representatives from Tanzanian line ministries (Interview questions are found in annex 3).

Four Swedish supervisors/coordinators within the research cooperation were interviewed in January 2014. The supervisors/coordinators were chosen as they represent institutions with a large number of Tanzanian PhD students within the research collaboration. The supervisors gave their views and perceptions on the sandwich model training and shared their experiences of the research collaboration as such. They also discussed what the research collaboration has meant for the Swedish university and if they still are in touch with any of their former Tanzanian PhD students. If new forms of research collaborations had been established after the PhD graduation, at post doc level or otherwise were also discussed.

In total 37 Tanzanian PhD holders/supervisors (12 women and 25 men) were interviewed in Tanzania during three weeks in February 2014. The number of interviews was decided in order to be representative in terms of gender, age, academic discipline and year of graduation. Most interviews were held at the three participating universities in Dar es Salaam: UDSM, MUHAS and ARU, but since the Institute of Marine Science, which is a part of UDSM, is situated on Zanzibar, a two day visit to Zanzibar was included to interview some of the PhD holders there. The interviews lasted on average between one and two hours and gave the interviewees a chance to expand on the questions asked in the questionnaire and explore various topics more in depth. Apart

³² Self-Evaluation of the Sida/SAREC Bilateral Research Cooperation Program: 1998-2008.

³³ Bernard H R: Research Methods in Anthropology: Qualitative and quantitative approaches. 1995

from the individual interviews, two group interviews were held with PhD holders at MUHAS and UDSM, as they have the largest number of PhD holders.

Interviews were also held with staff in strategic positions at the different university administrations and with relevant government bodies. One meeting was held at the Ministry of Communication, Science and Technology (MoCST) where Tanzania's new policy on Science, Technology and Innovation was discussed. The importance of research in development was emphasized.

The following chapters present and discuss the findings of the questionnaire and the interviews.

PHD TRAINING – CONTEXT AND INCENTIVES

The questionnaire was sent to all 150 identified and traced Tanzanian PhD holders who have been trained over the period 1981 to 2013. The response rate was 68 percent or 102 individuals (26 women and 76 men). The response rate is high compared to what is considered a normal response rate for self-administered questionnaires³⁴.

Members of university staff

Out of all graduated PhD students 89 percent were already academic staff at the collaborating Tanzanian universities, many of them at the level of Tutorial assistance (TA). This implies that they had gone through the selection criteria to become staff at the respective institutions. The remaining 11 percent were either graduate students or employed by some of the Tanzanian research institutes by the time of recruitment. The high percentage of academic staff to be recruited for PhD training is in line with the purpose of the sandwich model in most of Sida's bilateral research training programs, which is to increase the teaching and research capacity of university staff.

Age when starting PhD training by gender

As shown in the table below, the majority of the respondents started their PhD training between the ages of 31 years old and 45. There is, however a variation in the representation of women and men in the three age categories. The age bias in this sample is comparatively low, only 9 individuals were between 46-55 years when they started their PhD training. Moreover, due to shortage of staff senior researchers/lecturers are often employed on contract for years far beyond their retirement age.

Table 1. Age when starting PhD training by gender

Age/ gender	25-30	31-35	36-40	41-50	46-50	51-55
women	1	10	4	8	1	-
men	6	19	21	16	7	1
total	7	29	25	24	8	1

Incentives for PhD training

What were the incentives for beginning a long and may be cumbersome PhD training? How many years did the PhD training take and how did the sandwich model training work out for the PhD students?



Diagram 1. Incentives for PhD training

In order to explore what made the respondents aim for a PhD degree, four options were available on the questionnaire (with the possibility to mark several options). "To contribute to the development of Tanzania" scored the highest (86%) among the respondents, closely followed by "interest in research" (85%). "To get a better position at the university" was also of importance (56%), while "to get a higher income" was not given high priority among the respondents (29%). The fact that "contribute to the development of Tanzania" scored the highest will be elaborated in more detail in the chapter "Impact of research".

The incentives for PhD training were also brought up during the interviews. Several interviewees explained that it was necessary to have a PhD degree to be retained as academic staff at a university. But a strong belief that science and research is crucial for the development of the country and an interest in research were the most important factors behind the researchers' decisions to aim for a PhD degree.

³⁴ According to Bernard (1995) a response rate of 20-30% is normal in mailed questionnaires.

Year of being accepted as PhD student

For reasons not made available, women were not included in the PhD training during the early days. In general, relatively few individuals were accepted as PhD students during the 1990's. One explanation to this may be that the universities in Tanzania were not allowed by their Government to employ staff between 1994 and 2004, due to the conditions imposed by the Structural Adjustment Program (SAP) developed by the World Bank³⁵. From 2004 the universities could hire staff again and as can be seen in table 2, there is a larger group of academic staff being accepted as PhD students. Another factor explaining the increased number of female PhD students may be the affirmative action strategies developed by UDSM in 2000/01 to increase the proportion of female students at the university³⁶.

Table 2. Year of being accepted as PhD student by gender

	Women	Men
1980-1984		2
1985-1989		4
1990-1994	2	9
1995-1999	3	10
2000-2004	8	22
2005-2009	13	28
total	26	75

Sandwich model PhD training

The majority of the respondents (86%) reported that their training was organized in accordance with the sandwich model. The few who reported other types of training modality had either done a full-time training in a foreign country during the 1980s or had been trained locally in Tanzania, sometimes with the assistance of a Swedish supervisor.

Sida has never given instructions regarding the format of the sandwich model in terms of duration of stay for PhD students in Sweden or exactly how the collaboration between the Swedish and the Tanzanian university should be worked out. Thus, there have been variations in terms of times and length of students stay in

Sweden (from a couple of weeks to many months), structure of the studies and roles of Swedish and Tanzanian supervisors. Most Tanzanian PhD students have defended their PhD thesis at a Swedish University but there are also some who received their PhD degrees from the participating Tanzanian universities.

Although the PhD students are based at only three Tanzanian universities, during the periods when they were in Sweden they were spread out over a large number of Swedish universities. The collaborating Swedish universities with the largest groups of Tanzanian PhD students were Stockholm University, Umeå University, Karolinska Institutet, The Royal Technical College (KTH), and Uppsala University. There have also been a few Tanzanian PhD students based at Gothenburg University, Lund University, SLU and Chalmers University of Technology in Gothenburg.

Different modalities for research collaboration have been developed over the years. The collaboration between KTH in Stockholm and ARU has during later years been such that the PhD candidates opt for a Licentiate degree³⁷ in Sweden and a PhD degree in Tanzania. The Swedish supervisor is the main supervisor up to the licentiate and then the Tanzanian supervisor takes over and becomes the main supervisor for the continued work towards the PhD degree. At MUHAS all PhD holders participating in the bilateral collaboration receive their PhD degrees from a Swedish University. At UDSM there is a variation depending upon academic discipline and traditions which have developed over the years. At the UDSM Business School (UDBS) for example, the PhD candidates take a licentiate degree in Sweden and their PhD degree at UDSM.

There were no questions regarding the views and perceptions on the sandwich model training in the survey, but during the interviews this topic was brought up. All interviewees were positive to the sandwich model. They were especially impressed by the way research was conducted in Sweden, and the enabling research environment.

"The sandwich program has been extremely important for us and still is. If you have never been out of Tanzania and you get exposed to the world and the international research community, it is mind-blowing. It is so important for us here in Tanzania to get exposed to a good research environment like the one in Sweden". (Woman)

"The courses I attended in Sweden were really inspiring and important to me; the theory of Science, research methodology, how to write academic papers etc. It was all new to me. We did not have anything like that in Tanzania". (Man).

³⁵ The World Bank called for two linked reforms: the reduction of the role of the state in higher education and the shift of state funds from higher to primary education. See for example World Bank paper 1988: Education in sub-Saharan Africa: Policies for education, revitalization and Expansion, and World Bank paper 1994: Higher Education. The Lessons of Experience.

³⁶ Onsongo J (2009) Affirmative action, gender equality and university admissions – Kenya, Uganda and Tanzania. London Review of Education, vol. 7, No. 1.

³⁷ A licentiate degree requires at least two years university studies. It is often seen as a step towards a doctorate.

“The PhD training in collaboration with a Swedish university opened up the whole scientific world to me. I could attend conferences and workshops, not only in Sweden but also in Paris and many other places. I was able to meet internationally well-known scientists, which I heretofore had only read about. It made a deep impression on me to actually sit in the same room as some of the scientific giants”. (Man)

Both women and men also expressed that the sandwich model was especially good for PhD students with families, since they did not have to be away from home for such long periods of time and by going forth and back all the time they never lost contact with their families.

However, many interviewees, especially women, did also appreciate the time away from home and from the Tanzanian institution.

“I got more done in four months in Sweden than a year and a half in Tanzania. As soon as you get home, you have to attend to your family and do a lot of teaching. There is no time for research. In Sweden I could concentrate on my studies the whole time even during weekends”. (Woman)

The fact that the PhD students also were members of staff at their universities meant that they often had heavy teaching loads and administrative work during the periods they were in Tanzania. The time spent on data collection and field work became reduced and resulted in delays in the PhD training. This is of course problematic and should be looked into when planning future support. One of the objectives with the sandwich model is that it should build research capacity and create enabling research environments at the home university, but the heavy teaching and administrative loads have at least in some of the Tanzanian institutions prevented the emergence of a conducive research environment and culture.

Supervision within the sandwich program

All interviewed Tanzanian and Swedish researchers agreed that the collaboration between the Swedish and the Tanzanian supervisors had been good and smooth. There were no differences in women's and men's experiences of the supervision. The roles of supervisors varied. In some collaborations the Swedish researcher was the main supervisor and the Tanzanian researcher was co-supervisor and sometimes the roles were reversed. Since some of the collaborations between the Tanzanian and the Swedish university have been going on for many years, sometimes since the late 1980's, the Swedish and Tanzanian supervisors had often even become personal friends over the years. It was not unusual that former Tanzanian PhD students, after receiving their PhD de-

gree, began to supervise a new generation PhD holders, in collaboration with the same Swedish supervisor as they themselves had as supervisor.

Many interviewees commented upon the different styles of supervision between the Swedish supervisors and the Tanzanian supervisors.

“In Tanzania”, one of the interviewees explained, “you obey your professors and teachers. They give you orders and you obey. But the Swedish supervisor gave me advice – he did not tell me what to do. He used to say – if I were you I would do this or that, but it is your work and you have to decide how you want to pursue with your research. When I now supervise students here in Tanzania I try to do it the Swedish way”. (Man)

Other interviewees described how their Swedish supervisors were cordial and that they had become close friends.

“I have spent all seasons in Sweden, the dark winter and the light winter and have been picking mushrooms with my supervisor in the Swedish woods and was often invited to my supervisor's family home”. (Man)

The positive relationship between the Swedish and Tanzanian collaborating universities was also expressed in terms of ownership.

“There is a sense of Tanzanian ownership in the Tanzania-Sweden research projects. In some other collaboration, the foreign researchers take back samples to their countries and do not even invite the Tanzanian PhD students to be part of the analysis. In the Swedish collaboration, Tanzania owns the samples and the Tanzanian research students are completely involved in the analysis” (Man).

All interviewed Swedish supervisors explained that they had good experiences from the sandwich program and from supervising the Tanzanian PhD students as well as from collaborating with Tanzanian supervisors. Many are still in almost daily contact with PhD students and former PhD students. In the early days of the collaboration the Swedish supervisors were the main supervisors and the Tanzanian supervisors were co-supervisors. Some Swedish supervisors experienced that the Tanzanian supervisors had problems with the bureaucracy at the Tanzanian universities and had to spend too much time with cumbersome procurement rules and regulations. Over time the Tanzanian supervisors have gained more experience and confidence in supervision and have sometimes taken the role as main supervisor, with the Swedish supervisor taking the role of co-supervisor or becoming more of a mentor. This is also in line with the purpose of the program – that the Swedish supervisors let the Tanzanian supervisors take over more

and more until the Swedish supervisors are not needed any longer.

According to some of the Swedish supervisors there is still, however, a need for Swedish competence within certain areas. For example laboratory research within the medical field is according to a Swedish supervisor not strong yet, and needs further support. Long-term collaborations were also mentioned as being of utmost importance in order to develop analytic capacity and strong research environments.

The exposure to the Swedish universities has over the years also lead to certain changes in the Tanzanian university systems, and as far as can be understood more changes are underway. For example, the Tanzanian university system does not have any requirement for coursework during PhD training and dissertations are supposed to be monographs. But lately PhDs based on coursework and article-based dissertations are being discussed at all three universities and ARU has already accepted coursework as part of a doctoral degree and recommends various methodological and conceptual courses.

Year of PhD completion by gender

As can be seen from the diagram below, an increasing number of doctoral students have completed their degrees during later years, and there is especially a large group of women (14 women) who completed their PhD training around 2010. As mentioned earlier, this should be seen in relation to women becoming involved in the program at a later stage than men, occurring at a time (2004 and onwards) when larger number of students were accepted for PhD studies.

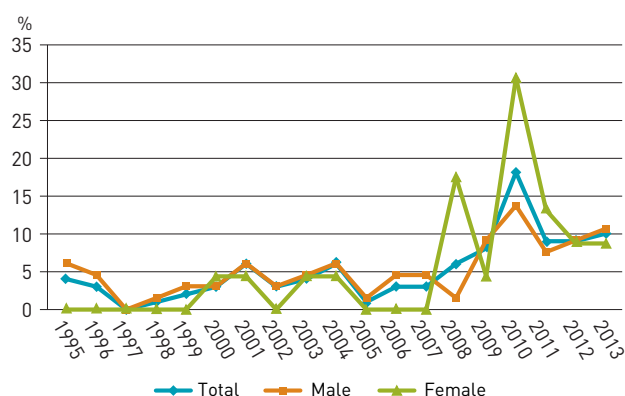


Diagram 2. Year of PhD completion by gender

Number of years to finalize the PhD degree

It has taken an average of 5.5 years for the PhD students to finalize their PhD degrees. Many of the students managed to finalize in 4 years, but several, especially the ones submitting their thesis in Tanzania, took much longer, due to a complicated waiver system with external examiners. Some of the interviewees mentioned that it could take up to two years or more after submitting the thesis, before they got their PhD degree. Some of the Swedish supervisors emphasized that it was almost impossible for the Tanzanian PhD students to finalize their PhDs in four years because of their heavy teaching- and administrative loads during the periods they were in Tanzania.

CAREER PATH AFTER PHD COMPLETION

PhD holders' geographic locations

A positive outcome of the research cooperation captured by this study is that 97 percent of the respondents (100% of the women and 94% of the men) are still living and working in Tanzania today. Only three respondents are currently not in Tanzania, one is at WHO in Geneva on a contract, and the other two are doing post doc research at universities abroad.

Employment after PhD completion

Almost all PhD holders (93%) have remained at their universities as members of staff after graduation. During the interviews several individuals mentioned that this was part of the deal. They had been selected as staff member to go for PhD training with the aim to become a lecturer/researcher at their home university.

The largest group of PhD holders is found at UDSM. 54 respondents (11 women and 43 men) are currently employed at the following academic units: the Institute of Marine Sciences (IMS); the College at Natural and Applied Sciences (CoNAS); the College of Engineering and Technology (CoET); University of Dar es Salaam Business School (UDBS) and College of Social Sciences (CoSS) including the Department of Economics and a few other units. The next largest group is to be found within the health related sciences at MUHAS. 32 respondents are employed there (9 women and 23 men). 10 respondents are employed at ARU (4 women and 6 men). The remaining 6 respondents (2 women and 4 men) are at other Tanzanian universities (Dodoma, Sokoine and SUZA), or Government agencies.

Table 3. Number of respondents according to university affiliation and gender

University	Women	Men	Total
UDSM	11	43	54
MUHAS	9	23	32
ARU	4	6	10
Other Univ. or Gov. Agencies	2	4	6
Total	26	76	102

Despite a decade of rapid expansion of higher education institutions, only a small proportion of the PhD holders are employed by other universities in the country. Employment options outside academia have attracted even fewer individuals to work at government agencies and ministries. Sometimes, however, they can be found to work on contract for a couple of years. One interviewee explained that since university staff are Government employees, they can be asked to serve at a Government institutions for a certain period and then return to their previous employment at the university.

The high percentage of respondents that have remained working at the universities is perhaps not surprising. Academic staff that were given the opportunity to pursue a research career knew from the very beginning that they were expected to return and use their achieved knowledge at their home institution. But, donors and national governments have for years been worried that highly skilled researchers from poor countries in Africa migrate to richer countries in the world, the so called “brain drain”³⁸. The sample from the current study shows that this did not occur within the Swedish research cooperation with Tanzania. Thus, the overall objective of the support to PhD training, i.e. building research capacity at selected national public universities, has indeed been achieved.

³⁸ See for example UNESCO report (2006): Universities as Centres of knowledge creation: an endangered Species?

CURRENT CAREER

Current employment positions

Most women hold positions as lecturers but there is also a fair number of women holding the position as head of department or division. Men hold positions as lecturers, senior lecturers, department or division head, professors and even vice chancellor. In general, there is a relatively

low proportion of women in higher positions at the universities³⁹.

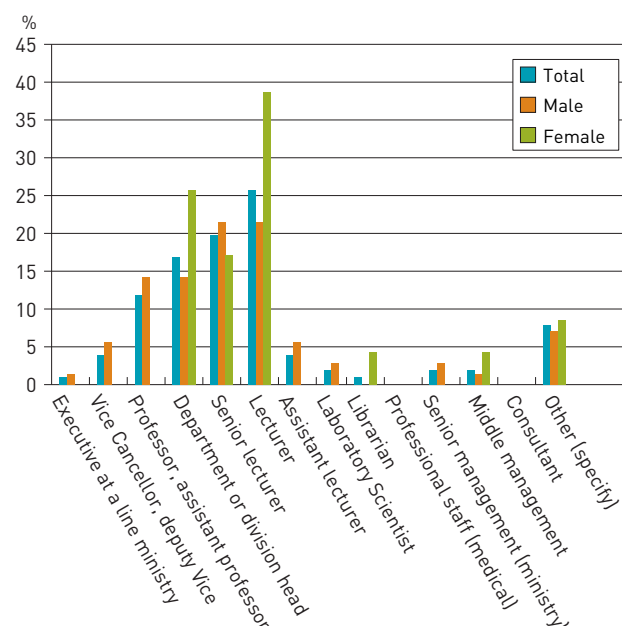


Diagram 3. Current employment positions

Most of the respondents had been assistant lecturers before the PhD training but could advance to lecturers after PhD completion. Some men, who were medical doctors before they began their PhD training, advanced to senior lecturer after receiving their degree.

Regardless if they had managed to climb the academic ladder or not some of the interviewees pointed out that a PhD degree gave them confidence and a higher status at the university.

“Tanzania is a very hierarchical society and if you as a student says something to a professor, he may say – who are you to say this? – but if you have a PhD you are more on their level and they listen to what you have to say.” (Man)

Rating of individual professional benefits

The respondents were asked to rank the professional benefits they gained through their PhD training in terms of skills recognition, progression in the same job, mobility

³⁹ The lack of women in high positions as professors were contested at a feedback meeting held at MUHAS toward the end of the data collection period, 28th February 2014. The participants argued that there are women professors within the group who had been trained with Swedish support. In order to make it possible for these women to respond to the questionnaire, the responding period was extended another three weeks, but unfortunately no women professors used the opportunity to respond.

across jobs and higher income. As much as 93 percent (both women and men) ranked skills recognition as “very high” or “high” while progression in the same job were ranked “very high” or “high” by 81 percent. Recognition through higher income was ranked less favorable by approximately 57 percent of the respondents.

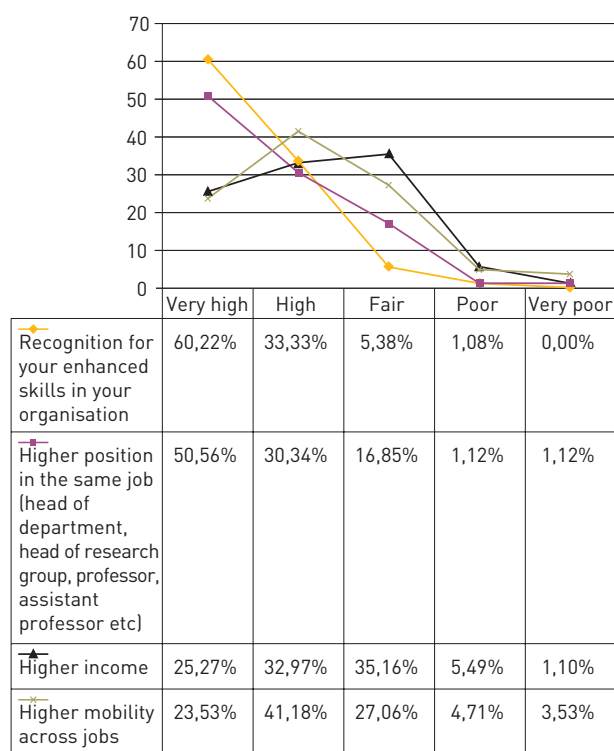


Diagram 4. Rating of individual professional benefits

Academic advancements and research groups

The only way to advance academically is through publications. All three universities (UDSM, MUHAS and ARU) have a system where single authored papers give a higher score than co-authored papers⁴⁰. This was mentioned as an unfortunate system for all sciences where people work in research groups or teams and publish their results together. Moreover, the system discourages the development of research groups and teams and this will have severe implications for the quality of research in the future if not changed. Most societal problems of today

⁴⁰ To move from the position of a lecturer to a senior lecturer, 3 points are needed. Since multi-authored papers (even in international peer-reviewed journals) give less points than single authored, a researcher may need 8 to 20 published papers to get the 3 points, depending how many authors each article has.

can only be solved by teams of qualified multi-disciplinary researchers. Most medical research, for example, can only be done by teams of researchers.

Despite the fact the Tanzanian system for academic advancement discourages co-authoring, 67 percent of the respondents reported that research groups had been formed as a result of them being part of the bilateral research program.

The problems with the prevailing system for academic advancement within Tanzanian universities were brought up by a majority of the interviewed. The point system, based on single-authored papers was seen as a big obstacle to advance academically. Moreover, it gives the researchers fewer possibilities to publish in international peer reviewed journals since these journals mainly accepts multi- authored papers.

Nature of current work

All PhD holders reported that they are involved in many kinds of academic activities. When asked about the nature of current work, teaching/supervision and research scored the highest followed by consultancy. Management and administration was also mentioned as being part of many of the respondents' duties.

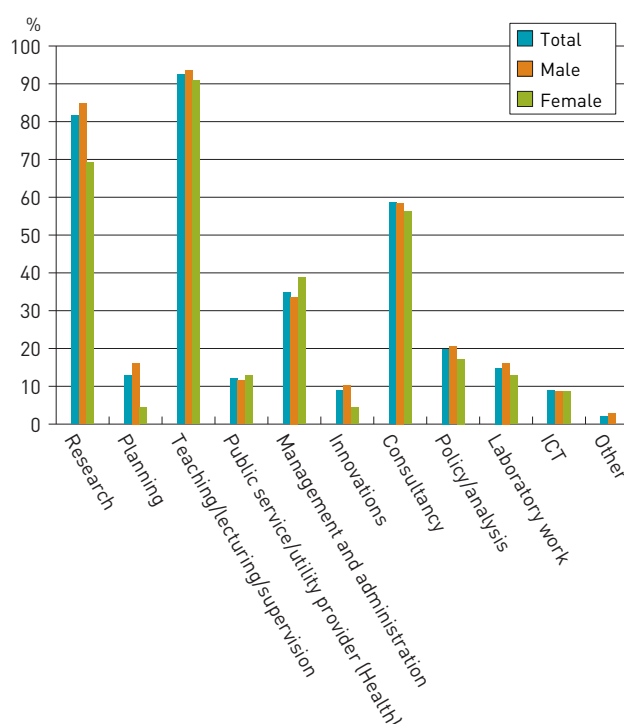


Diagram 5. Nature of current work (more than one option possible)

According to information given, a lecturer's position is ideally divided to include three types of work: research, teaching/supervising and public service and/or consultancies. For many interviewees it was difficult to find time to do all three activities.

When asked how much work time the respondents can allocate for research, 50 percent of the women and 42 percent of the men reported that it was only within the range of 10-25 %. Both women and men (40 percent) reported that they can set aside 25-50% of their time to research and finally 10 percent of the women and 17 percent of the men can allocate as much as 50-75% of their time to research.

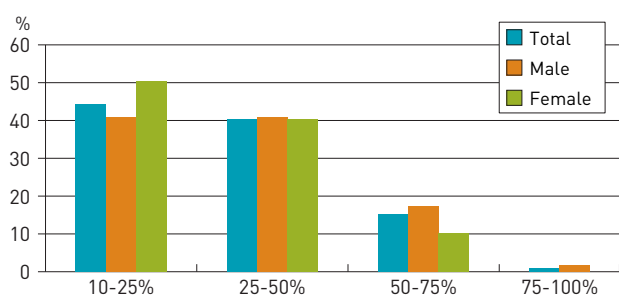


Diagram 6. Percentage of time spent on research by gender

Only 15 percent of the women and 26 percent of the men were fully satisfied with the amount of time they could allocate to research. Many of the women (35%) were not at all satisfied with the limited time that had available for research. Dissatisfaction was also expressed during interviews with women where several of them complained about heavy teaching loads and large classes. Bigger responsibilities for children and family may also be an attributing factor for less time to conduct research.

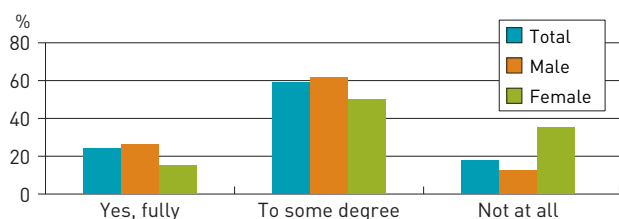


Diagram 7. Satisfaction with the time spent on research by gender.

Both men and women expressed a strong wish to dedicate more time to research than they currently do. However, time was not the only obstacle. Lack of research funding was seen as an additionally serious problem.⁴¹

"I usually write five proposals in order to get one funded. One has to hunt for funding and sometimes you get tips from friends or the internet and different networks. But it is hard work" (Man)

"Once you have a PhD you are supposed to be able to write fundable research proposals, but that is not so easy."(Man)

The amount of time that actually could be spent on research thus varied with relation to both available time and access to funding.

Public service/consultancies – the universities third mission

Public service/consultancies and community outreach are viewed as the university's "third mission". According to

UDSMs Research Policy and Operational Procedures from 2008, the university use different methods to transfer knowledge and technology to communities and ordinary citizens. Among other things the university organizes workshops, conferences and present research findings in more popularly written publications. UDSM also translates some research results from English into Kiswahili in order to reach a larger public. Researchers are requested to present and discuss their findings with communities and village governments.

Several of the interviewees agreed to that it was important to disseminate research findings and assist in the implementation of the results. They saw this as part of their work to reduce poverty in the country and strongly opposed that such activities did not lead to any academic advancement. One interviewee said:

"University leadership should be made aware that they are not promoting the reduction of poverty due to the current point system. We need to work with people, we need to talk to the pesticide users, not just write scientific articles about it." (Man)

Consultancies are also carried out at a varying degree at all three universities. According to data from UDSM, consultancy projects grew from 45 in 2005/06 to 94 in

⁴¹ COSTECH was mentioned as a source of research funding, but it was said to be difficult to get a research grant from them. Depending upon academic discipline and subject several sources of funding were said to be available for Tanzanian researchers: EDCTP, Bill and Melinda Gates Foundation, NIH, DFID, WIOMSA, CODESRIA, Wellcome Trust, Rockefeller, Carnegie and EU, but the competition was hard.

2011/12⁴². Some departments at UDSM, MUHAS and ARU have strong consultative links with Government ministries and departments. At ARU, consultancies and outreach have traditionally been perceived as more important than research and publishing. They gave examples of professional advice to industry and other important organizations. Environmental impact assessments were reported to be carried out by several of the PhD holders. Many felt that by doing consultancies they were also contributing to the development of the country. Consultancy at MUHAS is most often provided in the form of expert service for Government and public institutions.

Working conditions

Working conditions at the universities were not an issue brought up in the survey, but during interviews some researchers made comments regarding the poor infrastructure at their institution:

“The infrastructure at the university is a nightmare. No desks, no places to sit and work. There is 46 staff at the moment and only 13 desks. There are about 4000 students and not enough lecture rooms or study rooms. The environment is everything but conducive”. (Man)

“There are no laboratories in Tanzania that are equipped with gadgets for serious research in my area of specialization, therefore, I find myself difficult to engage fully in research” (Man)

Salaries were described as being low and difficult to live on and several of the interviewees explained that other sources of income were needed.

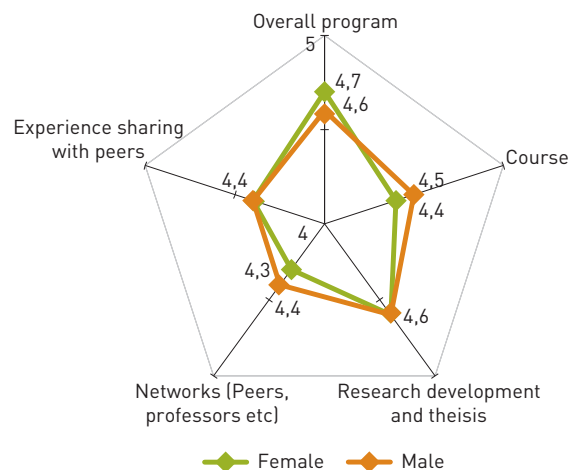
“The salaries are low, but you can survive. I do some income generating activities. I have a cow and sell milk, I also used to sell broilers.” (Woman)

The need for supplementary income was mentioned by many researchers and consultancies were also said to play a big role as an extra income generating activity. Some interviewees expressed that the Tanzanian Government still does not take research seriously since they have not earmarked enough funding to the universities. Subsequently many universities have bad infrastructure and low salaries.

Usefulness of PhD training in current work

The respondents were asked to rank their perception of the effectiveness and relevance of their PhD training with regards to its usefulness in their current work. Both women and men considered the overall program’s usefulness as “very high” and “high”, especially for the courses taken and development of research and thesis. In addition, the respondents ranked experience sharing and networking as

“highly” useful in their work. Women ranked networks somewhat lower than men.



Polar 1. Rating of usefulness of PhD training at current work

A large percentage of both women and men (around 90%) responded that they currently work in their expert area using the knowledge they obtained through their PhD training. During the interviews this view was further elaborated. The PhD holders use their knowledge, not only when they conduct research, but also when they teach and carry out consultancy assignments. They can suggest research topics for Master students in line with their own expert area and they supervise both Master students and PhD students in their specific academic fields.

Several of the interviewed researchers reported on the importance of participation in different forms of research collaborations and networks. Many had well established research collaborations and networks with Swedish researchers and Swedish Universities since the time they were PhD students, but they also reported on growing regional and international research collaborations and networks⁴³. Researchers at MUHAS for example, collaborate today with universities not only in Sweden but in USA, Belgium, Norway, South Africa, Germany, Finland and UK. Women seemed in general not to have developed research networks to the same ex-

⁴² UDSM, Facts and figures 2011/12

⁴³ Several regional and international research programs were mentioned like: CCIM (Climate Change impacts and mitigation program), VICRES, and WIOMSA. Some researchers reported that they were members of various African academic networks, like Africa network on chemical analysis of pesticides (anacapnet) and the Society for Ecotoxicology and Chemistry, or the Association of African Business Schools (AABS) and the network for operational research science in Eastern Africa (ORSEA)

tent as men, but in some research programs there were no difference between women and men.

Almost half of the respondents (48%) reported that they have regular contact with former supervisors and peers (both Swedish and Tanzanian) and 46 percent reported that they have occasional contacts. Thus, only a very small percentage have little or no contact. In some disciplines such as health sciences and marine sciences, there are still strong contacts and collaborations between many of the Swedish partners and the Tanzanian PhD holders and their respective institutions. Joint research projects continue several years after PhD completion, but now with mature collaborating researchers. Moreover, many of the PhD holders have become supervisors to new batches of PhD students and in that capacity they also continue to collaborate with Swedish supervisors and their institutions.

Gender influences on career paths

All three universities have gender policies, affirmative action programs⁴⁴ and address gender issues on various levels.

Gender issues have been a cornerstone in the Swedish support to UDSM and the support to the Gender

Dimension Programme Committee (GDPC) has contributed to an increased proportion of female students at the university. The affirmative action strategies contributed to increase the proportion of female students from 20% in 2000 to 42% in 2011⁴⁵. UDSM was the first university to develop a gender and sexual harassment policy in Tanzania. Studies on domestic violence, sexually transmitted infections and mortality have generated important findings on gender differences in health and health care use. UDSM has also had a policy impact at national level, and some of the policies (gender, sexual harassment, HIV/AIDS, ICT) are now being adopted by other universities.

MUHAS introduced a policy on sexual harassment the same year the university was established in 2007. The university has a Gender Unit, and affirmative action is in use for student selection.

⁴⁴ Affirmative action refers to a body of policies and procedures designed to eliminate discrimination against marginalized groups including ethnic minorities and women. What it means is if there are two or more qualified people to apply for a job, and one of them is a member of the disadvantaged group, then priority is given to that disadvantaged person. This priority does not mean that the minimum qualifications are ignored.

⁴⁵ Onsongo, J (2009). Affirmative action, gender equality and university admissions- Kenya, Uganda and Tanzania. London Review of Education. Vol.7, No. 1

A substantially high number of women (64%) and 31% of the men, reported that gender aspects had influenced their career path to some degree, while 23 percent of the women reported that gender aspects had not at all influenced their career (51% of the men). During interviews most women said that once they were employed by a university they did not feel any discrimination academically because they were women. The discrimination would appear at a younger age, when many parents and other adults did not think it was necessary for girls to go for a higher education. However, women still had the main responsibility for their families, to raise the children and look after aged parents and relatives, and that meant that they could not always devote as much time as they wanted to their academic careers.

"I have four daughters and feel I cannot move so fast academically because I need to spend time with my children and the rest of family" (Woman)

Given the short time available, an in-depth analysis of how gender aspects have influenced the PhD holders' career paths has not been possible to pursue in this study.

IMPACT OF RESEARCH

More than half of the respondents reported that 75-100 percent of their professional work is related to the development of Tanzania and another 37 percent reported that 50-75 percent of their professional work is related to the development of Tanzania. These are indeed high numbers and in line with the overall objective of the research cooperation.

A large majority of the respondents and the interviewees reported that they were deeply engaged in research with direct relevance to poverty reduction and the development of Tanzania. They considered themselves to contribute in several ways not only by developing important research results, but also directly in community outreach activities, extension work, public service, consultancies, innovation clusters, and in the creation of entrepreneurs.

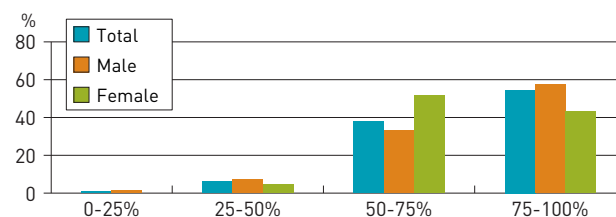


Diagram 8. Percentage of work related to the development of Tanzania by gender

The results reported are highly impressive. However, to give a full account of research results and their usefulness in terms of reducing poverty and developing Tanzania, is not possible in a study of this kind. Some examples of results that were brought up during the interviews are included below. They have to be viewed just as examples, not an exhaustive account.

Efforts are underway at all three universities to disseminate and promote the use of research results in society.

UDSM is today a recognized agent of change, 20 per cent of Tanzania's cabinet are researchers from UDSM. The current Vice-Chancellor of UDSM and the main author of the MKUKUTA (first poverty reduction strategy) were both trained within the Sida/ SAREC research cooperation. The research programs in linguistics produced the first language atlas of Tanzania. The information generated has been very important for primary education programs in different Tanzanian regions. Support to the College of Engineering and Technology (CoET) has been crucial for the establishment of the Innovation Systems and Clusters Programme in Tanzania and Eastern Africa (ISCP-Tz/EA).

TANESCO, the energy utility company in the country is now using the Insulators developed from the project research activity "Studies on insulators have of Composite Insulator Performance in Tropical Conditions".

The department of economics at UDSM contributed to the liberalization of the economy in Tanzania, when the country shifted from a centrally planned economy to a liberalized private sector-led economy. Several researchers are assisting the Government in issues on taxation, in planning and making projections on the economy and the GDP, on Tanzanian trade flows and on the impact of globalization on Tanzania's labor market.

Beneficiaries of scientific knowledge generated from the Marine Science Programme activities include many coastal sites in Zanzibar and mainland. Studies made by the program established that Marine Protected Areas (MPAs) play a key role in the conservation of habitats and management of a fishery and justified the existence of MPAs in the country. The Marine Science Programme has played a key role in the formulation of various Acts/Policies and the establishment of Marine Protected Areas. URT acts: Marine Parks and Reserve Act (1999), Forest (2001); Fisheries (2003), Environmental Management (2004) and the determination of MPA boundaries and other related policy influences.

One of the success stories of the Marine Science program is the development of the seaweed farming industry. The Zanzibar seaweed cluster initiative was estab-

lished in 2006. Seaweed export is now the second to tourism in the Zanzibar foreign currency earnings and employs about 5% of Zanzibar population. Strategies for addressing the negative effects of climate change in food insecure areas of Tanzania have also been developed.

The current Vice-Chancellor and two deputy Vice Chancellors at MUHAS were trained within the Tanzania-Sweden research cooperation. Findings from the Sida supported Kagera AIDS Project within MUHAS has led to a better understanding of trends and dynamics of HIV infection in various population groups in Kagera region. The results from this research guided the formulation of interventions that were implemented, leading to declining incidence of HIV infection in this region and subsequently other regions in Tanzania.

Results from evaluation of various HIV and malaria diagnostic technologies have led to development of National testing algorithms for HIV (HIV ELISA as well as HIV Rapid Test algorithms) and malaria rapid test algorithm. Studies on HIV testing and monitoring resulted in the establishment of appropriate technologies for improved early laboratory detection and monitoring of HIV infection in Tanzania.

Prevention of mother to child HIV transmission (PMTCT) studies have contributed to development of National Guidelines and effective interventions for PMTCT of HIV in Tanzania and also contributed to WHO policy formulation for prevention of breast milk transmission of HIV.

Studies on the natural history of HIV infection in Tanzania and the utility of potential interventions led to generation of evidence – based information which was used to guide the development of the National Guidelines for HIV care, treatment and support; and the Tanzania National HIV vaccine Framework. The establishment of baseline data and essential scientific and logistical preparations for the conduct of clinical trials in Tanzania have been made. Obstetrics database developed with Sida support has contributed to generation of information that has guided the development of home-based life-saving skills in awareness of danger signs, facility delivery and referral acceptances and care seeking during pregnancy complications.

Findings from studies in child sexual abuse and gender based violence have improved knowledge and awareness in health seeking behavior and reporting of events among survivors of child sexual abuse, rape, and intimate partner violence.

A PhD holder within the research cooperation at ARU has discovered ways of conducting protein purification-treating seed powder to extract active coagulant proteins. After treatment, the purified seed powder

was able to reduce water impurity by 90-94 percent with up to 200 times less seed powder than in the traditional method. The researcher received a patent for her method in 2011 and the findings are now being scaled up in rural areas where 80 percent of Tanzanians live and where there is a significant lack of clean water. Other research emanating from ARU includes solving conflicts regarding land ownership, land management, water issues and the development of low cost housing.

SUGGESTIONS FOR FUTURE SUPPORT

There were no questions regarding suggestions for future support in the survey, but during the interviews this issue was brought up by most researchers.

“Only young people should be part of the program from now on. There should be no training of older staff who are close to retirement.” (Woman)

“There is still a need to train people for PhD, but I would like to see the research geared towards solving community problems and not just be theoretical. To get a PhD should mean both that you learn critical thinking and analysis, but also to solve problems in society.” (Man)

“Exposure to the international research community is very important and it would still be very useful for Tanzanian PhD students to spend three months in Sweden to get that exposure.” (Man)

“There is a need for more innovative research and there should be funding for some months of post docs abroad. Women should be supported extra since it is harder for women to develop an academic career.” (Woman)

These are some of the suggestions brought up during the interviews. There was a consensus that there is still a need for PhD training, since there is a shortage of highly trained academic staff at the universities. This has partly to do with a huge intake of students at undergraduate level at the universities in later years, leading to that the current academic staff is overwhelmed by heavy teaching loads. To find time to do research was thus seen as difficult. It was suggested that only younger individuals should be given the opportunity to go for PhD training and not older individuals close to retirement. Women should be prioritized.

Most of the interviewees were positive to the sandwich model training, but argued that it was also time to focus on PhD training in Tanzania, and develop good facilities such as well-equipped laboratories and libraries,

good quality supervision and PhD courses. Many argued that it was also important for the PhD students to be exposed to international research communities, and suggested that even if the PhD students in the future will be based at a Tanzanian university they could spend a few months at a Swedish university, and/or be given the opportunity to attend international conferences in different parts of the world. Swedish supervisors could also assist by giving some courses at the Tanzanian universities.

Apart from support to continued PhD training, the majority of the interviewees stressed the importance of support to funding for continued research at post doc level.

SUMMARY AND CONCLUSIONS

In this study 150 Tanzanian PhD holders who had completed their PhD training during the period 1981-2013 were identified and traced⁴⁶. The response rate was 68% or 102 individuals (26 women and 76 men). In addition to the survey, 37 interviews (12 women and 25 men) with Tanzanian PhD holders/supervisors were conducted in Tanzania during three weeks in February 2014. The interviewees were selected to be representative of gender, age, academic discipline and year of graduation. Interviews were also held with four Swedish supervisors with longstanding experience from the cooperation, representing the largest collaborating Swedish universities.

The majority of the respondents (86%) had been trained in accordance with the “sandwich model” approach for PhD training, thus dividing their time between a Swedish university and their home institution. They had remained active at their home institution while being connected to a supervisor and taking courses at a university in Sweden.

Almost all of the PhD holders (93%), trained during the period 1981-2013, have remained at their Tanzanian universities UDSM, MUHAS and ARU as member of academic staff. They have all continued with research, teaching and consultancies and/or public service, which are the three types of work academic staff at these universities ideally should perform. Despite a decade of rapid expansion of higher education institutions in Tanzania, only a small proportion of the PhD holders are employed by other universities in the country. Employment outside academia have attracted even fewer individuals who are working at Government agencies and ministries, often only on contract for a few years.

⁴⁶ No PhD holders who had initiated their PhD training before 1981 were identified.

All three universities have gender policies, affirmative action programs and address gender issues on various levels. 64 percent of the women (31 % of the men) reported that gender aspects have influenced their career path to some degree. More women than men expressed that they were dissatisfied with the amount of time they could allocate to research which they attributed to heavy teaching loads and to the fact they have the main responsibility for raising children and looking after their families.

A large majority of the respondents (86%) and the interviewees reported that they are deeply engaged in research of direct relevance to poverty reduction and the development of Tanzania. They are contributing in several ways, in developing important research results, but also in community outreach activities, public service, extension work, consultancies, innovations clusters, and in the creation of entrepreneurs. A large majority of respondents also stated that they work in their expert area today using the knowledge they obtained through their PhD training. This is indeed positive findings and in line with the overall objectives of the research cooperation.

The study concludes that the PhD training program within the Tanzania-Sweden research cooperation has achieved its aim which is to form a core of Tanzanian academic staff through whom the continuous research training is built until sustainable.

The success of the program can most likely be attributed to the Sandwich model for PhD training, but without skilled and highly motivated individual scientists (teachers, supervisors, PhD students, research coordinators), in both Tanzania and Sweden such positive results may not have occurred.

Each of the Tanzanian university institutions have through the collaboration with Sweden increased its research capacity to carry out research and contribute to dissemination and utilization of research of importance to the country. There is evidence that the research cooperation is assisting Tanzania in its efforts to increase the role of research to develop a competitive knowledge economy.

The main findings of this study correspond with findings from tracer studies carried out in Viet Nam in 2009 and in Mozambique in 2013⁴⁷. Sweden has supported PhD training at universities in both Viet Nam and Mozambique. In conformity with Tanzania, the training has been in carried out in accordance with the

Sandwich model, and in both countries the graduates have remained at their home universities as staff members after PhD completion. There are ample evidence that this doctoral training model have contributed substantially to build the foundation for research at these universities in terms of highly qualified human resources.

LESSONS LEARNT AND RECOMMENDATIONS

The sandwich model PhD training has been very successful and the positive effects of the Swedish support can be found throughout the research cooperation. However, there is a need for continued support to PhD training since the number of qualified staff at Tanzanian universities today is still low. Since Swedish support will not go on forever it is recommended that Sida support in the future focuses on national PhD training in Tanzania, maybe with some form of support (supervisors, courses etc.) from Swedish universities. There is however important that the PhD candidates are given a proper amount of time off from teaching and other administrative work at their universities in order to concentrate on their research training.

There is evidence that high quality research is carried out by the trained PhD holders, but more resources and funding are needed for the researchers to continue with research and outreach after their PhD completion. PhD training is basically an education for future research and lack of research funding is a serious obstacle to continued research. Hence, support to research at post doc level should also be part of future Swedish support.

To conduct research and publish papers is currently the only way to advance academically. Moreover, in the Tanzanian university system single authored papers gives a higher score than co-authored papers. This is an unfortunate system for all sciences where researchers work in groups or teams and publish their results together. The system thus discourages the development of research groups which will have severe implications not only for the quality of research, but also for the internationalization of research in the future if not changed. Thus, the Tanzanian universities should be encouraged to change the point system for academic advancement. By giving co-authored papers the same score as single-authored papers, the establishment of research groups and teams will be encouraged.

In order to achieve poverty reduction research results have to be disseminated, implemented and used, thus extension work and community outreach activities, the so called “third mission” of the universities, should be taken more seriously and also lead to academic advance-

⁴⁷ Freudenthal, S (2009). Tracing Research Capacities in Viet Nam. Sida Secretariat for Research Cooperation: Felleson, M & Mählck, P. Academics on the Move. Mobility and Institutional Change in the Swedish Development support to Research Capacity Building in Mozambique. Nordiska Afrika Institutet, Uppsala.

ment. Otherwise there is a risk that the researchers focus only on publications.

Monitoring and evaluation (M&E) are necessary tools to inform decision-making, for accountability and institutional learning. Such tools have been weak or missing in the research cooperation program. This tracer study is the first of its kind in Tanzania despite many years of research collaboration. The program needs a much stronger M&E framework. To conduct tracer studies should be part of the regular M&E system. To carry out surveys on a regular basis would provide the universities and Sida with important information about how the cooperation is functioning and what options and possibilities PhD holders have to continue to conduct research after completing their PhD degrees. It would provide all involved parties with knowledge and ideas on how to best contribute to strengthen research environments in order to create sustainable research systems.

A number of internet based computer software programs are available today where the questionnaire answers are easily analyzed and turned into clear graphs and tables. It is recommended that the web-based questionnaire is sent to PhD holders every second year after PhD completion. It is suggested that the collaborating Tanzanian universities should be in charge of this and it requires that university administrations keep updated contact information of the PhD holders. Individuals who are being accepted as PhD candidates within the research collaboration can be asked to sign a contract that they will provide their university with updated contact information for 5 years after PhD completion and respond to questionnaires sent to them.

Tracer studies carried out by the universities every second year, will be valuable inputs to future evaluation studies commissioned by Sida. Such studies will make it possible to assess if the methods used have been effective in achieving the objectives of the research cooperation.

Researchers can also be traced through alumni networks, it is therefore also recommended that such networks are established, either at each university, or at one of them, including all PhD holders who wants to join. In order to attract members the alumni should be able to offer interesting seminars and other activities for researchers to meet, exchange ideas and develop new research contacts. Moreover, Facebook, LinkedIn and other internet based media could also be utilized for PhD holders to keep in touch.

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ANNEX 1

2013-10-18

Dar es Salaam

Inger Lundgren

TERMS OF REFERENCE

Tracer study of Research Students within Swedish Research Cooperation with Tanzania

1. Background

Sweden was one of the first countries to establish research cooperation with low income countries. The cooperation dates back to 1976. During the 1980s, the Swedish support was limited to cooperation with a few research institutes and contacts were made through the international research community. International exchange was considered very important. During the 1990s, the Swedish cooperation changed towards strengthening of research capacity in national priority areas and to creating conducive research environments.

Sweden has supported research capacity building at a number of universities and research institutes in low income countries and over the years through the so called 'Sandwich model' thousands of students have successfully defended their theses at various Swedish universities. The 'Sandwich Model' means that the training is divided between time spent in the PhD candidate's home country and in Sweden. The PhD candidates remain members of the staff at their home institution and carry out research relevant to problem areas in his/her country. After graduation the researchers return home to form the core of research staff through whom the continuous research support is built until sustainable.

The Swedish support to research cooperation with the cooperating countries has and is continuously evaluated with the aim to review the development of the research system and to assess to what extent the Swedish support to research collaboration has been in line with the national efforts to strengthen the research system.

Most of these evaluations concentrate on the capacity obtained and less focus is on what happens after graduation. Only one formal study has so far addressed this topic. Such studies however are imperative to under-

stand if and how the capacity created is used in academia and in society for the intended purposes. They would document important lessons learnt for Sida to consider when planning for future support.

The current tracer study will focus on the research cooperation with Tanzania. Sweden was one of the first countries to establish research cooperation with Tanzania in 1977. The support was initially channeled through the national research council UTAFITI. Since then, the cooperation has undergone adaptations to meet national needs and has led to the prevailing modality of support to research and innovation. The initial support was mainly directed to fund individual research projects. Later the focus shifted to institutional support aimed at building sustainable research capacity with research training as the crucial component, and more recently the emphasis has been placed on national and institutional ownership.

In 1995 University of Dar es Salaam (UDSM) was selected as a key partner for national research capacity building aiming at creating institutional and sustainable research capacity in Tanzania. Since 2007 two new universities branched off from UDSM, Ardhi University (ARU) and Muhimbili University for Health and Allied Sciences (MUHAS).

The focus of this study will be on doctoral students who have embarked on a research training programs within the Swedish cooperation with these universities.

2. Purpose and Scope of the Assignment

The study should be made in relation to the current overall goals of the bilateral research cooperation which have been to strengthen research capacity in the form of creating conducive research environments, providing research education and assist with methods to plan, set priorities and allocate funds for research.

The tracer study is to contribute to the following overall objectives:

1. Identify the career paths of the students that have initiated studies on a research training program supported by Sweden and identify factors that have influenced the students' choices.
2. Identify lessons learnt from the Sida/SAREC research cooperation and suggest how this support can be improved;
3. Suggest how Tanzanian universities and Sida, systematically, could monitor/trace the progress of PhD holders who have received Swedish research support.

Accordingly, in addition to tracing the carrier paths of the collaborating countries PhD holders the study should generate general lessons learnt and monitoring tools of interest to Sida.

3. The assignment

The consultant shall

1. Identify as many as possible of all doctoral students that has initiated studies within the bilateral research programme over the period 1977 to 2013. It should further identify how many that has ended their studies and at what level (MSc., Ph. Lic or PhD or dropping out without degree). It will also find out what has happened to them:
 - Are they still working in Tanzania? If not, where in which countries are they working?
 - Among those who remain? Where in the country are they working, at what institutions are they working and with what are they working? How many continue to carry out research? How many have a research based career? How many continue in research related professions (thus promoting research)?
 - How many works in their expert areas using the knowledge obtained through the research training?
 - Have the research training provided an individual platform for career development?
 - How many works in areas where they have no use at all of their research or thematic capacity? What are they doing?
 - How do the former students perceive their training and to what it has contributed?
 - How do they view their research results and its usefulness, and has this in any way influenced their positions in society (becoming entrepreneurs etc.)
2. Identify and discuss what the former students perceive as major factors being decisive for their career choices. While studies on the development of national research systems are important, it is equally important to find out more about the actors – the individuals - within these systems, about their possibilities to influence the system, but also about the ways in which they are being influenced by the system in their individual career choices.
3. Take gender aspects into account: the number of women and men who have been studying on the training programs and how gender aspects have influenced their career paths.

4. Methodology

The tracer study should build upon both qualitative and quantitative data. It should consist of two parts:

4.1 Fact finding in Sweden and writing of inception report

- study the history of the 36 years of research cooperation by reading all accessible Sida documents: assessment memos, annual progress reports etc.
- contact Cooperating and Swedish universities concerned in order to get lists students who over the years have been part of the bilateral research collaboration
- contact concerned collaborating universities and research institutions or other relevant organisations to trace the PhD holders;
- contact the collaborating country PhD holders via e-mail and through a simple e-mail based survey get basic knowledge about the PhD holder: age, gender, degree (or drop out) date of defence, subject area, career path after ending the program (with or without degree)
- make arrangements for interviews to take place in collaborating country and develop a semi-structured questionnaire to be used during the interviews

4.2 Fact finding in Tanzania

- Interview selected students;
- Interview representatives at concerned collaborating country universities and research institutes as well as representatives at some line ministries.

4.3 The consultant should make interviews with any person that is considered appropriate, but should at least include the following:

- Collaborating country PhD holders who have received Swedish support and who work in different disciplines;
- Relevant supervisors at Swedish universities and Cooperating universities
- Key staff at cooperating universities
- Some key people at relevant line ministries;
- Members of relevant research groups at universities and research institutes;
- Responsible officer at the Swedish Embassy of Tanzania.

5. Consultancy requirements

The consultant shall:

- Have solid research experience
- Experience in assessing research capacity building

- Broad knowledge of higher education and research management
- Experience from international cooperation
- Knowledge of collaboration with universities in low income countries (preferably Tanzania)
- Profound knowledge of Sida, its policies, strategies and methods for capacity building within research and post-graduate education
- Knowledge of carrying out consultancy and tracer studies
- Knowledge of Tanzania and the sub-Saharan region

6. The Tender

The tender must include:

- A proposal of how the assignment is understood, and a description of the methodology to be used.
- A time table for the assignment and a budget **in SEK**.
- CVs of all team members, including full description of theoretical qualifications and professional work experience, including list of publications.
- The tender cannot exceed 10 pages, excluding CV:s.

7. Time frame and budget

The assignment will be initiated 1 December, 2013 and completed no later than 9 March 2014.

Before the assignment starts, inception note shall be submitted to the Embassy of Sweden in Tanzania and a meeting with the Embassy shall take place to discuss in further detail the objects and methods for the evaluation. The evaluation is conducted and results shall be made available in a timely manner in relation to the purpose of the evaluation. Un-envisaged changes to timeframe and budget must be explained in the report. Any discrepancies between the planned and actual implementation and products of the evaluation must be explained. The budget cannot exceed 284 000 SEK.

8. Reporting

When the mission has been concluded, the major findings, conclusions and recommendations shall be compiled in a report in line with the scope of this evaluation. First, the consultants shall prepare a draft report in English, following the form for Sida evaluation reports, to be submitted electronically to the Embassy of Sweden for comments no later than **14 February 2014**. The major findings and conclusions from the draft report shall be presented and discussed in a seminar with stakeholders and the Embassy.

Three weeks after receiving comments on the draft report a final version shall be submitted to Sida (electronically and in two paper copies). The report shall be written in English in Word for Windows and should be

presented in a way that enables publication without further editing. The report shall contain an executive summary and it should not exceed 40 pp (annexes excluded).

8.1 Explanation of the methodology used

The tracer study report shall describe and explain the methods applied and discuss its validity and reliability. It must acknowledge any constraints encountered and their impact on the study, including their impact on the independence of the evaluation. It shall detail the methods and techniques used for data and information collection and processing. The choices must be justified and limitations and shortcomings explained.

8.2 Relevant stakeholders consulted

The report shall the stakeholders consulted, the criteria for their selection and shall describe stakeholders' participation. If less than the full range of stakeholders was consulted, the methods and reasons for selection of particular stakeholders must be described.

8.3 Incorporation of stakeholders' comments

Stakeholders must be able to make comments before a final report is written. The report shall reflect these comments and acknowledge any substantive disagreements. In disputes about facts that can be verified, the evaluators shall investigate and change the draft where necessary. In the case of opinion or interpretation, stakeholders' comments shall be reproduced verbatim, such as in an annex, to the extent that this does not conflict with the rights and welfare of participants.

8.4 Transparency of information sources

The report shall describe the sources of information used (documentation, respondents, literature etc.) in sufficient detail, so that the adequacy of the information can be assessed. Complete lists of interviewees and documents consulted shall be included, to the extent that this does not conflict with the privacy and confidentiality of participants.

Annex 2.

Questionnaire sent to all traced Tanzanian PhD holders

Tracer Study of Tanzanian PhD students within the Tanzania-Sweden bilateral research cooperation

Welcome to the Tracer Study of Tanzanian PhD students!

Research cooperation between Tanzania and Sweden has been going on since 1977. The overall goals of the bilateral research cooperation are to strengthen research capacity in the form of creating conducive research environments, providing research education and assist in methods to plan, set priorities and allocate funds for research.

The Swedish Embassy in Dar es Salaam and Sida are eager to find out what has happened to you after finalizing your PhD studies. What are the major factors being decisive for your career choices? Do you work in your expert area using the knowledge you gained through your research training? Have the research training provided an individual platform for career improvement? What lessons may be learnt from the research cooperation? How can Swedish support to research be improved?

Your participation in this tracer study is of utmost importance to The Swedish Embassy in Dar es Salaam, Sida and to the research community in Tanzania!

Personal data

1. Date of birth
2. Sex

Tanzania-Sweden bilateral research cooperation

3. Where you a staff member at a Tanzanian university before being accepted as a PhD student within the Tanzania-Sweden research program?

- Yes
- No

4. If yes, at which university were you employed?

- University of Dar es Salaam (UDSM)
- Arhdi University (ARU)
- Muhimbili University for Health and Allied Sciences (MUHAS)
- Other university or research institute

5. Year of being accepted as a PhD student?

6. What made you continue with higher education and aim for a PhD? (more than one option is possible)

- Interest in research
- Get a better position at the university
- Get a higher income
- Contribute to the development of Tanzania
- Other

7. At which Tanzanian university were you enrolled during your PhD studies?

- UDSM
- ARU
- MUHAS
- Other

8. Did you spend part of your PhD studies at a Swedish University?

- Yes
- No

9. If, yes which Swedish university?

- Chalmers University of Technology, Gothenburg
- Göteborg University
- Lund University
- Stockholm University
- The Swedish University of Agricultural Sciences (SLU)
- Karolinska Institutet (KI)
- Royal Institute of Technology (KTH)
- Uppsala University
- Umeå University
- Other University

10. In which academic discipline (research program) did you conduct you PhD research?

- Arts and social sciences
- Commerce, Management and entrepreneurship
- Culture and humanities; LOT
- Earth sciences
- Engineering
- Entrepreneurship and Business environment
- Food security
- Geology
- Gender studies
- Health sciences (Malaria, HIV, Reproductive health. Health systems research, RCS etc.)
- ICT
- ISP Programme
- Library
- Marine Sciences

Natural resources
 Political Sciences
 Renewable energy
 Science
 Urban and rural development
 Urban and planning management
 Other (name)

11. Year of ending your studies

12. At what level?

PhD
 Licentiate
 MSc
 Other degree
 Ending studies without degree

13. If you ended your studies without a degree, what was the reason?

Personal reasons (family, disease etc.)
 Did not find the PhD studies interesting
 Did not find the PhD topic of interest or worth pursuing
 Was offered a job outside academia
 Other reason

Career path after PhD studies

14. Did you continue with research after your PhD completion?

Yes
 No

15. If yes, in what capacity? (more than one option is possible)

Researcher/part of research group
 Teacher/supervisor
 Post-doctoral studies
 Laboratory work
 Research management
 Other (please, specify)

16. If you received your PhD degree more than 10 year ago, what have you done since then? (more than one option is possible)

Post doc studies in Tanzania
 Post doc studies abroad
 Conducting research alone or in a research group
 Teaching/supervising
 Laboratory work
 Research management
 Working with policy/analysis at a ministry or university

17. If you did not continue with research, what did you do?

Public service/utility providers (Health care, medical doctor, Education, teacher etc.)
 Central Government
 Regional/local government
 Financial institutions (banks, insurance, micro-credit etc.)
 International/regional organization (working for UN organizations or similar)
 Non-for-profit Non-Government Organization (NGO)
 Private sector
 Other

18. What was the reason for not continue with research?

Was offered a good position outside the university
 Was not offered a position as research staff at the university
 Was tired of research
 Found it difficult to get access to research funds or be part of research staff
 Other reason (specify)

Current career information

19. Are you living in Tanzania today?

Yes (if yes continue to point 22)
 No

20. If not, in which part of the world are you living and working?

Neighboring African country
 USA
 Europe
 Asia

21. If you are not working in Tanzania today, what was the main reason for your move? (More than one option is possible)

Did not find a suitable position in Tanzania
 Continuing further studies (post doc etc.)
 Was offered a university position
 Working for an international organization
 Working for a regional organization
 Working for a NGO or similar
 Representing public/private organization from Tanzania abroad
 Other reason (Please, specify)

22. If yes (question 19) – where in Tanzania are you working?

Dar es Salaam
Zanzibar
Dodoma
Arusha
Moshi
Other place

23. What type of organization do you work for:

Government agency/ministry
University/research institute
Public service/utility provider (health care, education etc.)
International/regional organization (UN organizations etc.)
Non-Government Organizations (NGO)
Financial institution (bank, insurance, micro-credit etc.)
Private sector
Other

24. If you have continued with research (including teaching, supervision, admin. Etc.) Where are you based?

UDSM
ARU
MUHAS
Other universities, colleges or research institutes (specify)

25. To your knowledge have research groups been formed at your university as a result of that PhD holders were trained as part of the bilateral research program?

Yes
No
Don't know

26. What is your current employment status?

Employed
Still studying
Volunteer/unemployed
Self-employed
Retired

27. With what are you working today? (more than one option is possible)

Research
Planning
Teaching/lecturing/supervision
Laboratory work
Public service/utility providers (Health care, medical doctor, agronomist, education etc.)

Management and administration

Innovations
Consultancy
Policy /analysis
ICT
Other (please, specify)

28. If research is part of your work, for how many years have you been conducting (involved in) research? (1-20 years)

29. If research is part of your work, how much of your working time can you devote to research?

10%, 25%, 50%, 75%, 100%

30. Are you satisfied with the amount of time you can devote to research?

Yes, fully
To some degree
Not at all

31. What is your current position?

Executive at a line ministry
Vice Chancellor, deputy Vice Chancellor etc. at a university
Professor, assistant professor
Department or division head,
Senior lecturer
Lecturer
Assistant lecturer
Laboratory Scientist
librarian
Professional staff (medical doctor, agronomist, forester etc.)
Senior management (ministry, university, business, international organization etc.)
Middle management
Consultant
Other (specify)

32. To what degree have gender aspects influenced your career path?

Not at all
To some degree
To a large degree

33. Do you work in your expert area today using the knowledge you obtained through your PhD training?

Yes
No
Partly

34. How would you rate the professional benefits you gained through your PhD training?

Recognition for your enhanced skills in your organization

Higher position in the same job (head of department, head of research group, professor, assistant professor etc.)

Higher income

Higher mobility across jobs

(Very high, high, fair, poor, very poor)

35. How would you rate the knowledge you gained in the different components of your PhD studies in regard to its usefulness in your current occupation?

Overall program

Courses

Research development and thesis

Networks (Peers, professors etc.)

Experience sharing with peers

(Very high, high, fair, poor, very poor)

36. How often have you been in contact with peers and supervisors you met during your PhD studies?

Regularly

Occasionally

Rarely

Never

37. To what extent do you consider your professional activities related to the development of Tanzania?

25%, 25-50%, 50-75%, 75-100%

38. Is there anything you would like to add regarding your career path?

39. Would you like to be part of a Research Alumni network?

Yes

No

If yes, please write your name here:

Thank you for your participation!

Annex 3

Questionnaire for Swedish supervisors/ coordinators

1. Your name and name of university and department
2. How long have you been involved in the Tanzania-Sweden Research program?
3. What is your role in the program?
4. Has your role changed over the years?
5. Can you tell me about the Tanzanian-Swedish research program/s at your university (department) – how it has developed over time, how many Tanzanian PhD students have been included and what kind of collaboration it has been?
6. Has the research training been according to the Sandwich model or other type of model?
7. How have you experienced the research training?
8. Have you supervised some of the PhD candidates yourself and if so what is your experience of supervising them?
9. If you have supervised, did you share the supervision with a Tanzanian supervisor and if so how has that worked out?
10. What problems (administrative or academic) have you encountered, if any, regarding the program? (Criteria for selection of PhD candidates?)
11. What has the research collaboration meant for your department or faculty at your university?
12. Are you still in touch with former Tanzanian PhD students (who today may be professors at their universities)?
13. Have any new forms of research collaborations been established after the PhD students have finalized their PhDs, like at Post-doc level or otherwise?
14. Do you have any success stories from the collaboration to share with me?
15. What lessons can we learn from the research collaboration so far and
Do you have any suggestions for how the research collaboration could be improved in the future?

Questionnaire for Tanzanian PhD holders, supervisor and coordinators

(Not all questions will be relevant for all individuals interviewed)

1. Your name, university and department
2. How long have you been involved (one way or the other) in the Tanzania-Sweden research collaboration?
3. What is your position at your University today?
4. Has your position and role changed over the years? Explain (i.e. from PhD student, to PhD holder, lecturer, supervisor, coordinator etc.)
5. What made you continue with higher education and aim for a PhD?
6. Did you carry out your PhD studies according to the so called “sandwich” model or according to some other model, and how did you experience your research training?
7. Did you have both a Swedish and a Tanzanian supervisor and how did that work out?
8. If you yourself are supervising new PhD students today, how do you find the supervising role?
9. What problems have you encountered (academic or administrative) if any, regarding the program? How about criteria for selection of PhD candidates?
10. What was the major factors decisive for your career choices?
11. Have gender aspects influenced your career path and how?
12. Did the research training provide you with a platform for career development?
13. What has the research collaboration meant for your department or faculty at your university?
14. Have research groups been formed at your university as a result of the PhD training and research collaboration?
15. Has other forms of research collaborations, contacts with the international research community, innovations or entrepreneurship been established?
16. To what extent do you consider that research achievements are relevant to the development of Tanzania and the mitigation of the poor?
17. If research is part of your work today, how much time can you devote to research?
18. Are you satisfied with the time you can devote to research? If not what can be done about it?
19. What lessons can be learned from the research collaboration?
20. Do you have any suggestions for how the research collaboration can be improved in the future?

Guidelines for Focus group discussions with Tanzanian PhD holders

The purpose of this FGD is to let you PhD holders share experiences and discuss with each other how you have experienced your PhD training and how you experience your work and role at the university today.

Let us begin by discussing what made you continue with higher education and aim for a PhD degree?

How did you experience your PhD training? (Was it according to the Sandwich model? How did it work to have a supervisor in Sweden and one in Tanzania, did you get enough time off from your teaching or other work to conduct your research? Etc.)

What did you do after finalizing your PhD studies?

What were the major factors decisive for you career choices?

How has gender aspects influenced your career path?

How do you experience your work at the university today?

Do you have any suggestions for how the research collaboration between Tanzania and Sweden can be improved in the future?



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