



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLU Global



Innovative Doctoral Education for Global Food Security 2013-2014

A Swedish Government Initiative

SLU-Global Report 2015:7



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“Words are wind”

From: Song of Ice and Fire by George R. R. Martin

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Acronyms

Acronym	Explanation
AAU	Addis Ababa University
ACP countries	The African, Caribbean and Pacific Group of States
ANAPE	The African Network for Agriculture, Agroforestry and Natural Resources Education
ASERECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASM	MSC program in Agroforestry and Soil Management at the University of Rwanda
AU	The African Union
ATVET	Agricultural Technical and Vocational Education Training
CAADP	Comprehensive African Agriculture Development Program
BITRI	Botswana Institute of Technology Research Innovation
CAEC	Makerere University's Continuing Agricultural Education Centre (CAEC) in Kabanyoro
CGIAR	Consultative Group for International Agricultural Research
CIFOR	Center for International Forestry Research
CHEA	Ministerial Conference on Higher Education in Agriculture in Africa
COMESA	Common Market for Eastern and Southern Africa
CUUL	Consortium of Uganda University Libraries
DocLinks	EU-Africa Doctoral Student Network
DRC	Democratic Republic of the Congo
EC	Division of Environmental Communication at URD SLU
EIWR	Ethiopian Institute for Water Resources
ESD	Education for Sustainable Development
EUC	Embu University College
FAEF	Faculty of Agriculture and Forestry Engineering at UEM
FARA	Forum for Agricultural Research in Africa
Formas	The Swedish Research Council Formas
GMO	Genetically Modified Organisms
GRBI	Genetic Resources and Biotechnology Institute, Zimbabwe
ICRAF	International Centre for Research in Agroforestry
ILRI	International Livestock Research Institute
ILSC	Information Literacy and Scholarly Communication Course
IPM	Integrated Pest Management
IR	Institutional repositories
ICT tool	Information and Communications Technology tool
IUCEA	Inter-University Council for East Africa
JKUAT	Jomo Kenyatta University
KU	Kenyatta University
KV	Department of Clinical Sciences
MAK	Makerere University
MFS-scholarship	Minor Field Study scholarship financed by Sida
NAIP	National Agriculture Imagery Program
NAFT	National Agricultural Forum for Training
Maklib	Makerere University library
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NOVA University Network	Nordic Forestry, Veterinary and Agricultural University Network
OA	Open access
RAFT	Regional Agricultural Forum for Training
SADC	Southern African Development Community
SASACID	Strengthening Africa's Strategic Agricultural Capacity for Impact on Development
Sida	Swedish International Cooperation Agency
SLU	Swedish University of Agricultural Sciences
SUA	Sokoine University of Agriculture, Tanzania
TAE	Tertiary Agricultural Education i.e. higher education at bachelor, master and doctoral level in subjects related to and important to agricultural development

Acronyms, *continued*

TEAM Africa	Tertiary Education for Agriculture Mechanism
UB	University of Botswana
UD	Swedish Ministry for Foreign Affairs
UEM	Universidade Eduardo Mondlane, Mozambique
UNIKIN	University of Kinshasa, Democratic Republic of the Congo
UNZA	University of Zambia
UoN	University of Nairobi
UR	University of Rwanda
URD	Department of Urban and Rural Development, SLU
USAID	United States Agency for International Development
WMI	Wangari Maathai Institute, Nairobi University
WWF	World Wildlife Fund

Foreword

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Arvid Ugglå

Professor, SLU

Chairman of Programme
Steering Committee

Agriculture is a knowledge-based operation that requires experience, skills and essential investments to be long-term sustainable. Due to rapidly growing populations and an accelerating urbanization combined with a stagnant agricultural productivity, many countries in sub-Saharan Africa urgently need to achieve greater yields from farming. A key component in this endeavour is to invest in higher agricultural education in subjects related to and important to agricultural development (in this report also called tertiary agricultural education or TAE). Farming specialists with a science-based approach play vital roles in creating programmes to advise farmers on how to increase their productivity while still adhering to sustainable farming practices. They are also pivotal in a necessary process of modernizing and increasing the capacity of national educational systems in agricultural sciences. Moreover, they are needed in the advancement of knowledge and new ways of implementing this knowledge in society, not least in the national policy spheres. At the recent sixth Africa Agriculture Science Week and in the FARA general assembly, this challenge was expressed as “Africa feeding Africa through agricultural science and innovation”.

The Swedish University of Agricultural Sciences (SLU) has a governmental mission to conduct research and education to support natural resource management and the agricultural sector in its broadest sense, and to conduct national environmental monitoring and assessment. A global perspective is an integral part of most activities at SLU, and participation in international collaboration and capacity development projects together with partners in low-income countries has always been vital to our university. SLU’s Agricultural Sciences for Global Development programme (SLU Global) is a university-wide platform for international development cooperation in research and higher education. The objective is to facilitate wider multidisciplinary cooperation and communication for many disciplinary groups throughout SLU. The coordination and reporting of the current programme is one example.

Since 2009, the Swedish government, through the Ministry for Foreign Affairs (UD), has made specific investments in programmes aimed at supporting long-term food security with an emphasis on sub-Saharan Africa. In 2010, the ministry made an allocation of SEK 40 million with the purpose of strengthening research capacity in agricultural sciences at some African universities in collaboration with SLU. The programme was reported in *The SLU Global Food Security Research and Education Programme 2010-2013. A Swedish Government initiative. SLU-Global Report 2013:2*. The following year, 2011, an additional allocation of SEK 15 million was made, this time with a focus on facilitating multidisciplinary cooperation and communication potential for many disciplinary groups and this programme was reported in *The SLU Global Food Security Research and Capacity Development Programme 2012-2014. A Swedish Government Initiative. SLU-Global Report 2014:6*. Here we report results from the third, and final, UD allocation that SLU received in 2012 to be used during 2013 and 2014 with a focus on the education of doctoral students in collaboration with East African partner universities. Doctoral students are obviously an important group from a socio-strategic perspective as they will be future leaders not only in academia but in many sectors of society. A progressive and dynamic educational system will thus have a long-term impact on economic and community advancement in addition to its more obvious influence on scientific progress. To this end, SLU initiated the *Innovative Doctoral Education for Global Food Security* programme in order to contribute to capacity development in higher education and doctoral studies related to agricultural sciences and natural resources management.

The present funding was decided by UD in December 2012 and a programme manager was appoint-

ted in February. The last activity was concluded on 22 December 2014. Beginning and successfully executing a programme with many and different activities was possible through:

- experienced researchers/teachers, with ongoing research collaboration and the ability to adjust their activities and recruit colleagues at the partner universities;
- professional facilitators at the university library and pedagogical development units;
- the experienced support structure of SLU Global.

It can be a dilemma to ensure long-term effects of extensive programmes of very short duration. If they build on and maybe also reinforce already established networks and programmes the prognosis is good. However, they also disrupt both ordinary business as well as institutional development. On the other hand, if the programmes are short but more or less involve the same partners, some kind of continuum can be created, provided that key people remain in the organisations.

On behalf of SLU and our partners we wish to express our thanks to the Swedish Ministry for Foreign Affairs for its foresight and its generous support of the programme. This support has contributed strongly to the consolidation of an extensive network and a platform for continued investments in collaborative agricultural research and capacity development activities between SLU and its partners, in particular in sub-Saharan Africa. The platform is an integral component in the maintenance of a Swedish internationally competitive resource base in the fields of agricultural and environmental science. It is our hope that the foundation created and the links established with African universities, research institutes and organizations over the course of the UD's now five-year investment in SLU's capacity development programmes will continue in other ways now that this particular governmental initiative has come to an end. SLU has the commitment and capacity to participate in future efforts to contribute to sustainable global food security.



How the aims and achievements of the programme **Innovative Doctoral Education for Global Food Security** align with those of TEAM-Africa and NEPAD

TEAM-Africa



There is an increasing consensus that sustainable growth and development of agriculture in Africa require urgent reforms in Tertiary Agricultural Education (TAE) systems in order to produce a workforce that has the capacity to guide and facilitate agricultural transformation and to promote the competitiveness of African agriculture. African Union (AU) leaders have underscored their vision to improve agriculture through the Comprehensive African Agriculture Development Programme (CAADP) as a continental framework for higher levels of growth (6 percent of annual growth) with increased investments (at least 10 percent of national public expenditures) in the agricultural sector.

After ten years' experience of CAADP implementation, the review of constraints in 2013 pointed out that actors implementing at the country level have suffered setbacks due to lack of qualified technical staff. The Ministerial Conference on Higher Education in Agriculture in Africa (CHEA) held in Kampala in 2010 recognized this in their final statement and asked for a continental strategy to re-invigorate higher education (TAE) and human capital in the agricultural sector. Obviously, the majority of graduates produced today in African TAE systems seem to no longer meet the needs of the actors in a modernizing agricultural sector with market-oriented agro-producers, agro-processors and dynamic service suppliers to the consumer demands.

In response to these intentions and the underlying challenges, African TAE experts and their partners have developed the Tertiary Education for Agriculture Mechanism called TEAM-Africa. This has a mandate to serve as a platform for the advancement of a radical transformation of African TAE in order to provide means for a critical mass of well-trained graduates for implementing CAADP objectives.

The New Partnership for Africa's Development (NEPAD) of the AU is responsible for coordinating and implementing the AU's mandate and has agreed to host TEAM-Africa through its planning and coordinating agency in order to synergize with the Agricultural Technical and Vocational Education Training (ATVET) mechanism for improvement of agricultural training.

In this context, the SLU programme *Innovative Doctoral Education for Global Food Security*, which emphasizes that farming specialists with a science-based approach have vital roles in agricultural development and productivity growth in Africa through modernizing and increasing the capacity of national agricultural educational systems, aligns extremely well with NEPAD's goals and priorities and interlinks with TEAM-Africa's vision and objectives.

The programme 'Innovative Doctoral Education for Global Food Security' implemented multiple activities to develop the capacity of higher education and doctoral studies related to agricultural and environmental sciences in Africa and thus contributed significantly to support the ongoing initiatives of TEAM-Africa to transfer cross-cutting pedagogical and research approaches, quality assurance routines and good supervision practices to African TAE institutions. In 2013 and 2014, the SLU project supported some key activities for TEAM-Africa like the TAE leadership seminars to sensitize university leaders in the needed reforms at the institutional management (including strategic planning, quality assurance and self-assessment), teaching and learning (updating curricula and use of ICT tools) and resource mobilization (business models in TAE institutions). The project's extensive efforts and support are very much appreciated.

With best regards,

Hamidou Boly
 Professor

TEAM-Africa Coordinator

Introduction

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In their functions as educational centres and knowledge producers universities have a key role in the work for global food security. To develop their core capacities, it is crucial that the proportion of the educational staff with a doctoral degree increases at all universities. Irrespective of whether the doctorate holders have a career inside or outside academia, their work will require an ability to work in interdisciplinary, international contexts and to communicate and lead in a pedagogically efficient manner.

In the *Innovative Doctoral Education for Global Food Security* programme, we have given priority to activities that support targets and principles that the European Commission has identified as crucial for innovative doctoral training (ERA Research policy 2011*). These include:

- research excellence
- attractive institutional environment
- interdisciplinary research options
- exposure to industry and other relevant employment sectors
- international networking
- transferable skills training
- quality assurance

To meet these specifications we have conducted:

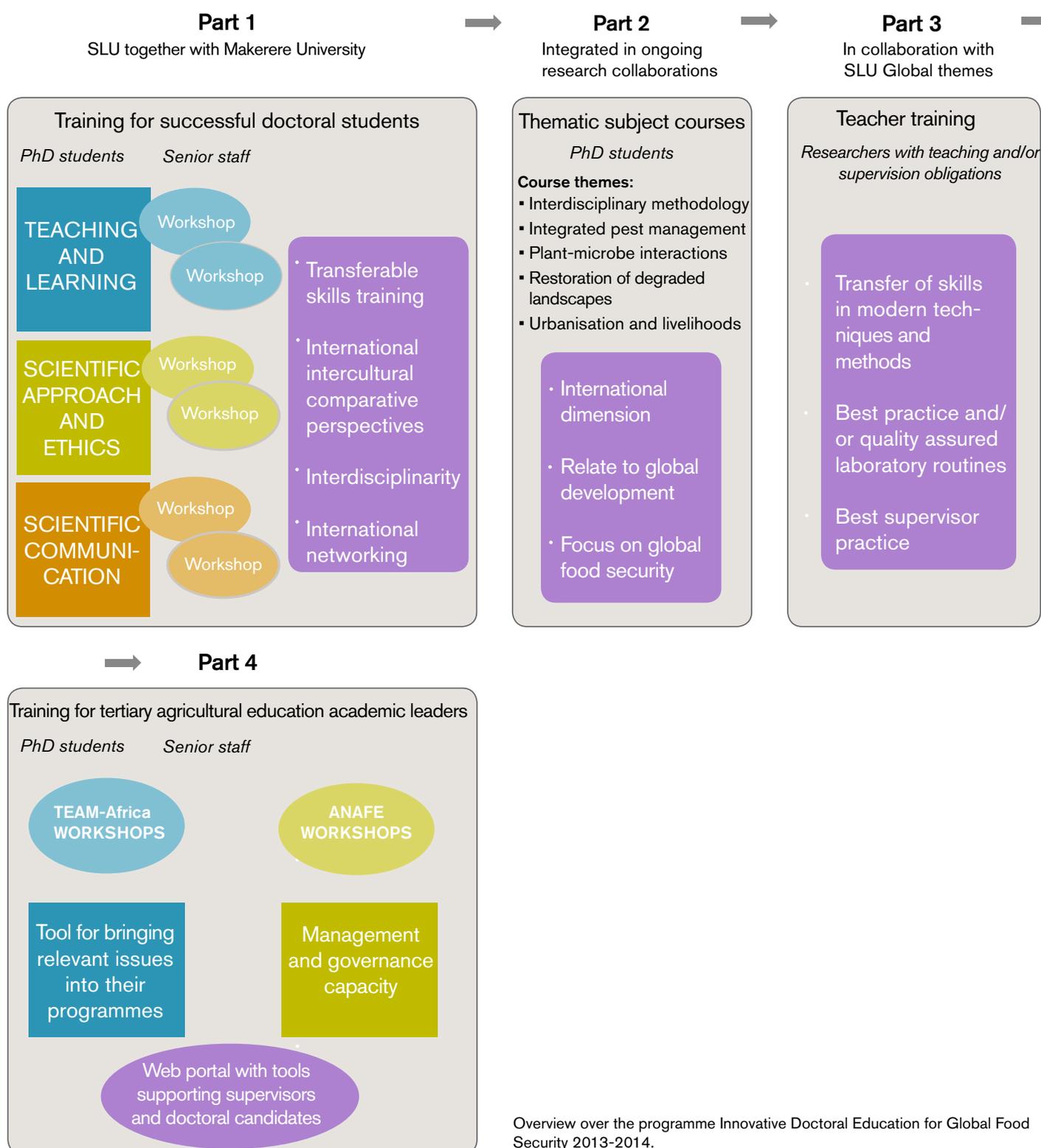
- thematic subject courses for doctoral students as described in Chapter 1, *New knowledge and methods for achieving global food security – joint higher education between SLU and six East African universities*;
- transferable skills training courses for doctoral students and transferable skills training workshops for senior lecturers, supervisors, librarians and senior staff as described in Chapter 2, *Innovative doctoral education – training of transferable skills to build for tomorrow’s research quality together with Makerere University*;
- workshops in academic and educational leadership as described in Chapter 3, *Agri-food sector in rapid change requires reforms of institutional management, governance and leadership of higher agri-education*;
- exchanges of teachers/researchers between African partner universities and SLU as described in Chapter 4, *Mobility – transfer of skills in modern techniques and methods, best practice and quality assurance routines through teacher exchange*.

As a result, doctoral students, supervisors, senior staff and doctoral education capacity have developed both in a number of African universities and at SLU.

Courses for doctoral students

The thematic subject courses for doctoral students, see Chapter 1, were created within the scopes of ongoing research collaborations between researchers at SLU and universities and international research institutes in Africa. Within their respective subject themes, researchers jointly planned and conducted doctoral courses related to global development of relevance for food security. Course themes were either subject or methodology centred and they were conducted at the African partner university with teachers from both universities. The courses were announced through established research networks, which resulted in students appearing from a large number of African countries and sometimes even from Europe, including Sweden.

A course for doctoral students entitled Transferable skills training for successful doctoral students, see Chapter 2, was jointly developed and implemented by facilitators from Makerere University



Part 4

Training for tertiary agricultural education academic leaders

PhD students *Senior staff*

TEAM-Africa WORKSHOPS

ANAFE WORKSHOPS

Tool for bringing relevant issues into their programmes

Management and governance capacity

Web portal with tools supporting supervisors and doctoral candidates

(MAK) in Uganda and SLU. The course was based on experience of courses that both universities already offer their doctoral students. At MAK they are called cross-cutting courses and at SLU general basic courses. Skills such as communication, leadership and teamwork are typical examples of transferable, or as they sometimes are called, generic skills. Of course, doctoral students have more or less already mastered some of these skills but a more systematic understanding and training adapted to what is requested in future careers, are a relevant part of the doctoral education. Based on these existing courses, the team developed a novel course in which doctoral students from a large number of African countries practised teaching and learning, scientific approach and ethics, and information literacy and scholarly communication over a period of three weeks.

*“Innovative
doctoral education
— tomorrow’s scientific
quality”*

International, intercultural and comparative perspectives

The international background of both teachers and doctoral students, and the fact that the courses were conducted in Africa gave opportunities to include international, intercultural and comparative perspectives in teaching. In addition, all courses had elements that required the students to perform exercises together and to cooperate through practising and applying knowledge and skills acquired from the coursework. By conscious grouping, these elements also helped the doctoral students get to know each other and learn about each other’s projects, which created conditions to build long-lasting networks.

Interdisciplinarity

Research and other activities aimed at contributing to global food security largely need to be done in an interdisciplinary context. Insight into and understanding of the knowledge traditions and scientific approaches of various disciplines provide a basis for effective collaborations. It is therefore important that doctoral students during their training meet contexts and activities that are not solely motivated by the benefits of their own dissertation work. These other contexts can often become breeding grounds for issues and methodological developments they will be working with for the rest of their professional careers. The participants in all courses included in the programme had mixed disciplinary backgrounds.

Senior lecturers, teachers, supervisors, librarians and senior staff

In addition to educating the doctoral students, the joint courses were also intended to support the development of the pedagogical competence of staff at partner universities. Teachers and facilitators active in both the thematic and the transferable skills courses were supported with pedagogical training during the course planning phases.

The ability of teachers and supervisors to teach and supervise in interdisciplinary contexts and to utilize modern methods and techniques of research communication and publishing was trained at two-day workshops held jointly by facilitators from MAK and SLU, see Chapter 2. Participants from many African countries took part in these workshops.

Quality assurance

National regulations governing university activities vary and every university has its own local regulations and administrative structures that set the framework for how education will be conducted and the requirements for graduation. In addition, pedagogical standards are diverse and can have a major impact on how the teaching is done. This results in different standards for syllabuses, course credits, the form of and requirements of examinations, teachers’ skills, criteria for students’ prior knowledge, etc. Collaboration on education is a way of gradually developing quality assurance systems towards compatible standards.

Institutional governance and management

The need to improve institutional governance and management in Tertiary Agricultural Education (TAE), i.e. education at bachelor, master and doctoral level, in subjects related to and important to agricultural development, has been emphasized by both the World Bank and the African Union. In collaboration with the current programme, the African Network for Agriculture, Agroforestry and

Natural Resources Education (ANAFE), a long-time SLU partner, organised a regional training workshop for university leaders in order to compile experiences and lessons learnt in handling challenges in institutional governance and management and devise an action plan for the way forward. The workshop is described in Chapter 3, *Agri-food sector in rapid change requires reforms of institutional management, governance and leadership of higher agri-education*.

As part of a method study, two leadership training workshops were also organized in collaboration with the Tertiary Education for Agriculture Mechanism (TEAM Africa) and institutions in Tanzania and Mozambique, see Chapter 2.2, *Improving tertiary agricultural education leadership in Africa – a training tool for African academic leaders* to bring relevant issues into their programmes. During these workshops, about 70 young African academic leaders were given the opportunity to reflect in depth about the situation of TAE at their home institution. They discussed practical solutions with respect to (1) policy and governance management, (2) teaching methods, and (3) resource mobilization for improving the performance of the TAE system in Africa in general and in the particular region where the workshop was held.

In addition to supervisor training workshops, see Chapters 3.3 and 3.4, pedagogical support in the form of a web portal was initiated during the programme. The web portal is connected to other ongoing SLU projects and its development will therefore continue when the programme ends and the portal will be a public accessible domain.

Exchanges of academic staff

Scholars engaged in teaching and research at an African organisation collaborating with an SLU Global theme visited SLU for shorter or longer periods, see Chapter 4, *Mobility – transfer of skills in modern techniques and methods, best practice and quality assurance routines through teacher exchange*. Their area of research had to be relevant to global food security and they were expected to have good opportunities to influence institutional capacity development at their home institution. Some SLU scholars also visited African partner organizations.

The exchanges aimed to;

- train participants to use modern techniques and research methods and be able to instruct students and colleagues in the same skills; or
- set up techniques, methods, equipment, quality assurance routines and/or teach new users; or
- act as mentor for supervisors, advising on good supervision practices and routines and structures supporting supervisors.

In all, 20 scholars changed their place of work for a shorter or longer time. As a result of the exchange, all of them produced manuals, instructions, course plans, course programme descriptions, etcetera to provide support in the next step in skill transition.

Footnote

*Extract from "Report of mapping exercise on doctoral training in Europe. Towards a common approach" of 27 June 2011, adopted by the European Research Area (ERA) steering group on human resources and mobility. The principles were defined with the help of experts from university associations, industry and funding organisations. They reflect the Salzburg principles of the European University Association (EUA), good practice in member states and the Marie Curie experience. The principles have been endorsed in the EU council conclusions on the modernisation of higher education, Brussels, 28 and 29 November 2011. http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/educ/126375.pdf



New knowledge and methods for achieving global food security
– joint higher education between SLU and six East African universities

Introduction

Erik Karlton

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SLU

While many universities in Sweden struggle to get students to some of their educational programmes the situation in low-income countries is different. The governments have high ambitions to expand higher education, new universities are being formed and the intake of new students is high. The expansion of university education is creating an increasing demand for qualified university teachers with doctoral degrees. In most countries there is also a growing agricultural business sector that requires highly qualified professionals.

Earlier, the normal way for an African student to get a PhD was to be granted a scholarship and study overseas. This has changed. Many African universities have begun their own PhD programmes but due to limited resources they face challenges. There is usually little money for research, limited availability of qualified supervision and a research infrastructure with room for improvement.

One of the most important ways to assist academic capacity building that has an impact on food-security alleviation is to support doctoral education in agriculture. SLU, as a university of high academic standard, has over the years contributed to capacity building programmes by receiving and examining PhD students from all over the world. However, due to the shift towards establishment of national PhD programmes, this support is undergoing a transition from receiving students at SLU towards participation in doctoral education through collaboration with partner universities in low-income countries. In the future it will be more common for SLU teachers to contribute supervision and teaching at a partner university. The PhD students may stay for short periods at SLU to acquire some international experience and have access to resources when needed. This will make the support to PhD education more cost-effective since expenses for accommodation and upkeep can be kept much lower.

A common way to contribute to doctoral education for students from low-income countries is to invite students to our universities to participate in doctoral courses. This approach certainly has advantages. The good infrastructure, access to well-stocked university libraries, modern and functional laboratories and many qualified teachers most often contribute to a good result. There is, however, also a major drawback. If the course deals with developmental perspectives, it is taken out of the local context. Learning about how to do research in developing countries in a classroom in Sweden may become a little like learning how to swim by practising the movements on land. It does not necessarily work when you get in the water.

To avoid this, we used a different approach and organized thematic courses at some of our partner universities in Africa. Five different doctoral courses were given in Kenya (2), Uganda, Ethiopia and Botswana and one course for master students in Kenya. One obvious advantage when you give a course related to development and agriculture in a developing country is that the problems the course is addressing are accessible for study visits and field exercises. However, it is not without its challenges. Frequent power cuts, transport problems, unreliable Internet connections, limitations in laboratory facilities, and bureaucracy in the transfer of funds are just some of the difficulties that the course organizers encountered.

So what is it that SLU can contribute to these courses? The most important thing is that we have teachers with excellent competence in their subject areas. They have insights into contemporary science and can provide a course content that is up-to-date and relevant. SLU also has a good tradition in pedagogical training so the teachers not only know their subject well, they are also good at sharing their knowledge with others. A third aspect is networks. Senior SLU teachers often have a wide and extensive network and can share contacts and introduce students to other researchers and institutions around the world.

It is important to understand that it is also of benefit to SLU and its teachers and students to work with and attend these courses. Organizing the courses widens perspectives, gives new insights into development related problems and provides contact with colleagues in the collaborating institutions. Ideas for new research projects and further collaboration are often conceived when you work closely with new partners. This will prove useful since the amount of research funding that is available for research related to poverty alleviation and food security is considerable and experience from working in these environments and having networks can provide opportunities to apply for new research funds. One common observation when reading the evaluations from these five courses is that the participants were very satisfied with the course contents while they found more problems related to the practical arrangements in some of the courses. This is not strange or necessarily due to poor course planning. It is more difficult to organize courses in these countries, especially if you are including field and laboratory work in the course content.

Developing new courses is time- and effort-consuming. Teachers generally put in more work than they are paid for through the budget. Running a course for the first time also gives you experience and opportunities to improve the course content to make it more relevant. The impact of the work and resources invested would be multiplied if the courses were given more than once. It would be worth discussing how some of the course formats developed in this programme could be utilized either with fresh funding or in ongoing or planned capacity building programmes.

It may be difficult to measure the long-term impact of these courses exactly but the beneficial effect of training PhD students is lasting. People with PhDs will contribute to capacity and societal development for a long time after graduation, either in universities or at other institutions. This is one of SLU's contributions towards realizing the Swedish Government's *Policy for global development*.



Global challenges in food security – theory and methods

A collaboration with University of Nairobi and the Green Belt Movement

Project leaders: Rolf Johansson, Nadarajah Sriskandarajah and Kiama Gitahi



Photo: Rolf Johansson

Participants in the course Global Challenges in Food Security. Theories and Methods in Conservation, Development and Communication, doing group work. At the Green Belt Movement's training facility, Langata, Nairobi, Kenya.

Summary

This course was conducted in March 2014 in collaboration with the Green Belt Movement and Nairobi University and had 17 participants from seven countries in the Global South. They were trained in developing a research programme from a problematic experience in a real life situation. The course had 10 days of lectures, seminars, workshops and field studies. This was the third time this course was offered and it has been developed at the Department of Urban and Rural Development at SLU.

Introduction

The course welcomed participants from different disciplines with PhD

projects related to issues of food security. The idea behind the course was to introduce theory of science and research methodology and then go to the field in order to identify researchable topics and outline research programmes, indicating researchable problems, theoretical frameworks, and methodological approaches.

The course, conducted from 17–28 March 2014, had a four-week workload for the student and was a collaboration between the Green Belt Movement, Wangari Maathai Institute for Peace and Environmental Studies, University of Nairobi, and the Department of Urban and Rural Development at SLU. From SLU, scholars from the

Summary in Swedish

Kursen genomfördes i mars 2014 i samarbete med Green Belt Movement och Nairobi University och hade deltagare från 7 låginkomstländer. De tränades i att utveckla ett forskningsprogram med utgångspunkt från en problematik som upplevdes i en verklig situation. Kursen bestod av 10 dagar av föreläsningar, seminarier, workshops och fältstudier. Det var tredje gången kursen erbjöds och den har utvecklats vid institutionen för stad och land vid SLU.



Photo: Rolf Johansson

Kiama Gitahi (Wangari Maathai Institute/University of Nairobi) (left) och Nadarajah Sriskandarajah (SLU/Urban and Rural Development), teaching the course Global Challenges in Food Security. Theories and Methods in Conservation, Development and Communication. At the Green Belt Movement's training facility, Langata, Nairobi, Kenya.

three subjects Environmental communication, Landscape architecture and Rural development were engaged. The venue was the training facilities belonging to the Wangari Maathai Institute, located in Langata, Nairobi, Kenya.

The 17 participants came from seven countries: Kenya, Uganda, Tanzania, Ethiopia, South Sudan, Nepal and Bolivia. Two of the participants were registered as PhD students at SLU.

Course objective

The theme of the course was “Global challenges in food security: Interdisciplinary exploration of theory and methods in conservation, development and communication”, and the participants elaborated on themes in the field of research methodology and research design. They also discussed theoretical and methodological issues in relation to their own PhD projects. Practical applications were discussed in the context of selected field cases.

Learning outcomes

On completion of the course, participants would be better able to position themselves in the lands-

cape of theories and methods and have improved skills to develop a problematic issue into a research design and methodology choice.

Specific expected outcomes from the course were that after having finished the course, participants would be able to:

- discuss and relate to literature within the themes of global food security, conservation–development nexus and gender in the context of natural resources management;
- relate theoretical perspectives and methodological approaches to their own research project;
- utilize the field experiences offered in the course to develop researchable issues and a suitable research design for now and the future.

Course description and content

The course had 10 days scheduled for lectures, seminars and field excursion.

The first three days were lectures on theory, methods of scientific inquiry, and a keynote speech relating this to food security. In lectures, key concepts and themes in the interface of na-

tural and social sciences research were discussed, such as social constructionism, systems thinking, reflexivity, gender and development, and methodologies such as action research and case studies. Three days were devoted to a field excursion to the wildlife migration corridor in Nairobi National Park, where the conflict between wildlife conservation and urban development was in focus, and to the village of Othaya, where different aspects of natural resource management (especially agriculture and forestry) and development were studied in the context of an interplay between rural livelihoods and conservation and sustainability.

The last four days were in-class workshops and the concluding session.

In total, the course required four weeks of course-work from the participants.

Evaluations and lessons learned

This was the third time this course was delivered. Each time, the overall theme has been adapted to fit the current context and a keynote speaker specifically addressing the theme was included. Colleagues at Nairobi University were engaged in the planning phase of organising and facilitating the field studies.

The course has been developed and refined each time, and the overall impression from the evaluation is that it is appreciated in the form and content it now has. However, the participants would like to spend more time in the field and have more time for feedback on their own research projects. They also, in this case, asked for a greater amount of commitment from our collaborating partner.

Many of the participants were working on research proposals they had to deliver to their university right after the course and for that reason they wanted more discussion and feedback on their projects than was planned for in the course.

Teaching and learning considerations

The participants had PhD projects more or less related to food security, but came from different disciplinary backgrounds: social sciences, natural resources management, agricultural innovation, communication/extension, environmental sciences, project and business management. This worked fine, since the basic idea of holding the course is to bring different disciplines together, offer theories, methods and skills, then go to the field and experience a problematic real-life situ-

ation, and finally identify researchable issues and suggest an approach.

The facilitators come from two universities with differences in administrative procedures and systems, academic tradition and pedagogical approach. To handle these differences during the course process, i.e. planning, implementation and evaluation, is one part of internationalisation of the education.

When implementing the course, one problem was that the local facilitators had difficulties setting aside their other duties and consequently did not participate in the teaching as much as envisaged.

We had a low response rate in the course evaluation with only ten out of seventeen submitting one. One reason was that the students from Makerere were very busy preparing their research proposals and eager to focus on that alone as soon as the course finished each day. The overall impression from the evaluation and the students' commitment to the course is that on the whole it was appreciated and useful to them.

There was a problem with late dropouts. 23 applications were submitted and 20 of those applicants were accepted. Close to course start, seven had dropped out or could not be contacted. At a late stage more students from Nairobi University were accepted and the course finally had 17 participants. 14 fulfilled all requirements and passed the course. Three did not submit their final assignment.

Areas of improvement/Next steps

The content of the course was appreciated and there is no obvious reason to change it. If the course is repeated, an expanded field excursion could be considered since this was suggested by many of the students. This demand can be met in the next course, although as a consequence the course will then probably have to be scheduled for more than ten days. During the course many of the participants were in the phase of formulating their own research project and they asked for more discussions of their own projects. If that is the case when the course is repeated, it would be wise to allocate more time to discuss individual projects.

Possible future impact on educational development

All participants that filled in the evaluation form said they will share their experiences from the



Rolf Johansson (SLU), Nadarajah Sriskandarajah (SLU), Seema Arora-Johnson (SLU), Niek Koning (Wageningen) and most of the participants in the course Global Challenges in Food Security. At the Green Belt Movement's training facility, Langata, Nairobi, Kenya.

course with their colleagues at their home university, or that they had themselves acquired useful skills that will improve their own teaching. If they manage to do this there is an obvious capacity building effect from the course. Countries and institutions from which the course participants were drawn represented those with which SLU has had an ongoing engagement. In this sense, the course was of benefit in terms of SLU's own internationalisation efforts in education in general and PhD training in particular.

University of Nairobi and its Wangari Maathai Institute (WMI) were chosen as the venue for the course in view of an ongoing partnership being developed between WMI and SLU, and the mutual interest of the two institutions in the theme

of the environment, peace and development. Further SLU involvement in PhD education at WMI, and research and outreach collaboration via the Green Belt Movement are under consideration for the future. ■

Integrated pest management and food security in the tropics

A collaboration with Addis Ababa University

Project leaders: Abigail Walter, Birgitta Rämert, Abebe Getahun and Habte Tekie

Summary

Integrated pest management (IPM) is a pest management philosophy that aims to obtain the greatest economic, social, and environmental benefits from agriculture while minimizing risks. A PhD course on the topic was presented jointly by SLU and Addis Ababa University in November and December 2014. The goal of the course was for participants to move beyond a narrow focus on their own research and be able to establish an IPM programme for system-level pest management. In order to achieve this goal, students completed assigned background reading, attended lectures and discussions given by subject matter experts, visited farms in the Ethiopian Rift Valley, and worked in groups to analyse pest management at one of the visited farms. We encountered several challenges in organizing this course, the most notable of which was the tragic passing of Dr Emiru Seyoum, the Ethiopian organizer. Drs Getahun and Tekie of AAU stepped up to provide excellent support for the course, especially with regard to the field trip. Overall, both students and instructors were very happy with the course, although there were several aspects that could be improved in the future. The instructors would be very eager to participate in a similar course in the future, and feel that there would be great benefits from consistently and reliably offering this type of course.

Introduction

Integrated pest management is a principle for pest management in agricultural production that calls for maximizing economic, social, and environmental benefits from agriculture by combining control methods and limiting pesticide use.

In this course, we intended for students involved in pest management to move from being narrowly focused on their own research projects to having an applied, system-level perspective.

The course was conducted in collaboration between the Department of Zoological Sciences at Addis Ababa University (AAU) and the Department of Plant Protection Biology at SLU.

Fifteen PhD students from AAU, three from Hawassa University, Ethiopia, five from Jimma University, Ethiopia, and five from SLU took the course. A person from the Ethiopian Horticultural Development Agency audited the course. The course featured expert speakers working in Ethiopia, Sweden, Kenya, Norway and the United States.

Course objective

The goal was to enable the students to develop a fundamental understanding of how to integrate basic disciplines such as biology, ecology, and land management to create resilient and sustainable management of pests and diseases in different cropping systems. The students were also expected to have two-way communication with growers concerning pest problems and possible solutions. The goal was to allow students and expert instructors from diverse backgrounds to learn from each other.

Learning outcomes

On completion of the course, participants were expected to be better able to:

- describe the diversity of pests and potential managements that are available;
- explain the principles of Integrated Pest Management (IPM) and the advantages that IPM may offer compared to traditional pest control;
- select appropriate management strategies for a given crop and anticipate the consequences of the management for the target pests and other pests, the cropping system, and the environment;
- identify knowledge gaps that impede the adoption of IPM for a given system;
- design an IPM programme for a

Summary in Swedish

Integrerat växtskydd (IPM) är en bekämpningsstrategi som siktar på att uppnå de största ekonomiska, sociala och miljömässiga fördelarna inom jordbruket samtidigt som riskerna minimeras. En doktorandkurs i integrerat växtskydd hölls gemensamt av SLU och Addis Ababa University i november och december 2014. Målet med kursen var att deltagarna skulle viga vyer och se bortom sin egen forskning och upprätta en IPM-strategi i ett odlingssystemperspektiv. För att nå detta mål läste studenterna referenslitteratur, deltog i föreläsningar och diskussioner hållna av ämnesexperter, besökte jordbruk i Rift Valley, samt gjorde ett grupparbete där de analyserade växtskyddet vid en av de besökta gårdarna. Både elever och lärare var mycket nöjda med kursen, även om det fanns aspekter som skulle kunna förbättras i framtiden. Lärarna skulle gärna ge en liknande kurs i framtiden och känner att det skulle finnas stora fördelar med att regelbundet erbjuda en sådan kurs.



“This project was a great opportunity for networking for me!”

Interview

Abigail Walter – one of the project leaders

What are your most important reflections from the project? I think that it is so important that researchers here in Sweden and in Africa really communicate. The groups of students and teachers I worked with had so much to learn from each other. It's very important to set aside what we think we know and really listen to what the other person is saying about what is needed and what the solution could be.

Did you create new networks during the project? This project was a great opportunity for networking for me! I had the opportunity to work in Ethiopia with colleagues that I had previously interacted with only when they were visiting Sweden. Being with them in Ethiopia really helped me to understand their situation better. I also formed new collaborations with some of the guest instructors in the course. This has resulted in new applications, and hopefully will bring new research topics and students soon.

Have any new skill, method, way of thinking or doing things come out of the project? I hope that I am becoming a better communicator. I think before the course I would have had certain assumptions about what is known and what the common goals should be within my field of research. Now, I realize that backgrounds and goals can be very different. It's important to talk about what are goals are for research and education, and why we have those goals.

Would you like to share any unexpected experience? My course relied heavily on guest lecturers who were experts in their sub-discipline. At the beginning of the course, we made a list of a 'dream team' of instructors to invite, and we were shocked when every single one said yes! Many of these international experts spent several days or a week with us, even though their lecturing was over after just one day. I think it says a lot about how much people want to help, if you can just make the opportunity for them to do it.

specific pest or cropping system that minimizes environmental impact and meets the social, economic and technological needs of the grower.

Course description and content

The course represented a workload of five weeks for the students. The students completed assigned background reading before the course met in Addis Ababa in November 2014 for two weeks with daily lectures from subject experts working in Africa, Europe and North America. Every day, the students had at least one hour (usually two hours) for small-group discussions with the speakers after the lectures. After the first week, there was a field trip to a variety of farms in the Ethiopian Rift Valley. Finally, students worked in groups of four to analyse the pest control program being conducted for one of the crops and sites visited on the field trip. This analysis was the basis of the examination and was presented as an executive summary and oral presentation and discussion on the last day of the course.

Evaluations and lessons learned

The Department of Plant Protection Biology at

SLU and the Department of Zoological Sciences at AAU have a long history of fruitful collaboration and shared MSc and PhD students, which facilitated the collaboration.

Tragically, the course coordinator from AAU, Dr Emiru Seyoum of AAU passed away prior to the course, in January 2014. The role of project leader from AAU was taken over by Dr Abebe Getahun, Head of the Department of Zoological Sciences, and Dr Habte Tekie. Drs Abebe and Habte are commended for their great efforts in taking over to make arrangements for the course. They often had to work outside their specialties and professional networks to make the course run smoothly.

The systems for examination and awarding credits for courses at SLU and AAU proved to be incompatible. Consequently, it was decided that the course would be offered on a pass/fail basis. The lecture topics were decided jointly and lecturers were nominated from the professional networks of the respective universities.

The organization of the field trip was an area where differences between Swedish and Ethiopian practises became very apparent. There was an



Photo: Abigail Walters

Banner at the main entrance to the natural science campus of Addis Ababa University announcing that the Integrated Pest Management and Food Security in the Tropics Course is underway.

extensive administrative procedure involved in arranging farm visits in Ethiopia (permits from the Ministry of Agriculture, stamps and seals from the farm, pre-visits, etc.) that was not anticipated by the Swedish instructors. Dr Habte and Dr Abebe invested a great deal of time and effort in making the field trip a reality.

Also, the procedure for passing money from SLU to AAU for course expenses was complex and the course account at AAU was consequently not opened until the first day of the course.

Teaching and learning considerations

Topics were selected to provide a broad overview of the field, and to meet needs that were evident in the AAU and SLU PhD training programmes. The instructors were happy with the balance of topics in the course.

The learning outcomes were written to reflect the skill felt to be needed by a PhD student ready to work independently in the field of IPM. Overall, most of the students felt that the learning outcomes were met and expressed a high degree of satisfaction with the course, giving an average rating of just over nine on a ten-point scale.

The students came from different backgrounds and fields and as a consequence they learned much from each other. However, in some cases, the instructors assumed that the students had more extensive background knowledge than some of them actually had. In the group-work backgrounds, specialties and gender were mixed. Based on the students' presentations and their comments in the evaluations, it was considered that the mixing worked.

The students wanted more time on the field excursion. They also wanted more time to interview the growers, but this had to be balanced by the willingness of the growers to reveal business aspects of their farm.

In terms of the most valuable topics, students singled out the lectures on pesticide conventions, farmers' field schools, theory and practice of IPM, and nematology as being especially valuable. They considered management of GMOs and molecular aspects of plant resistance to be of less value.

After the student evaluations, it was concluded that some topics should be added to the course or improved. The importance of vertebrate pests such as rodents, birds, and large mammals like



Students scouting for pests during the field trip to the Rift Valley, Ethiopia.

Photo: Abigail Walters

hippos was overlooked in pest management in Africa, and those aspects should be addressed. Discussions between students and instructors were considered an important teaching/learning aspect of the course. There was, however, a concern that students would not be prepared to interact in this way. The importance of discussion and interaction was emphasized in the materials distributed before the course and during the welcome session. It was therefore gratifying to observe the level of interaction that was achieved.

One challenge that was found in terms of teaching/learning activities was how the students treated the compulsory reading assigned before the course and which several students did not complete. There were some initial technical problems: some of the students reported problems in accessing the Fronter page for the course, where the texts were made available.

Areas of improvement/Next steps

One area of improvement has to do with the scheduling of the course. To get the maximum benefit from the field trip, it would be good if it took place by the end of September at the height of the growing season and when the greatest diversity of pests can be observed. However, this timing could clash with the season for other field work for both Swedish and Ethiopian students. A second concern during the field trip was that some of the growers spoke only Amharic and the instructor engaged for translating was unable to attend due to scheduling conflicts. In future, there a professional translator should accompany the group on the field trip.

There are a number of important social science aspects to be considered in order to implement IPM at the farmer level. The lectures on farmer field schools and pesticide conventions included some of these aspects, but many of the students asked for more consideration of social science. With the present construction of the course, it is difficult to include more social science topics, but some lectures could perhaps be altered to emphasize the contributions of social theory. One observation was that during discussions of GMOs, there were four instructors in favour and no one prepared to discuss drawbacks. More balance of viewpoints should be aimed for in future.

The SLU and Ethiopian students were housed at different locations. If this course is given again, efforts should be made to house all of the students in the same location to allow them to



Students interviewing strawberry growers during a field trip to the Rift Valley, Ethiopia.

Photo: Abigail Walters

interact more with each other. The students' accommodation may need to be improved, but the students also need to be better informed about local conditions and their expectations need to be handled better.

Possible future impact on educational development

Most course participants came from universities and research centres in Ethiopia, so this course is an important component in building the manpower needs of these universities. Furthermore, the course bridged a gap in IPM expertise at AAU. Because so many external speakers were included, the course also bridged gaps in training at SLU (i.e. risk assessment and conventions on pesticides).

This course was also important for strengthening the relationship and educational collaborations between SLU and AAU. Our universities share a large number of PhD students under various arrangements. The interactions between the co-advised students and their Ethiopian and Swedish advisors that took place parallel to the course activities created added value. This also provided an avenue for contact between educators from SLU and Ethiopian universities, an important first step towards joint training of students in the future.

Given once, this course was an excellent experience for the participants. However, a possible repeat of the course could become an essential part of the PhD education experience for students from Sweden, Ethiopia and other African countries. If the course were to be repeated, it would be possible to make it much more international by attracting students from other African countries. A reliable scheduling of the course, for example every one or every two years, would allow it to be fully integrated into the educational programmes of SLU, AAU and the other collaborating universities.

Concluding remarks

This course was a challenge to organize for both SLU and AAU, but the outcome was extremely satisfying. Training by leading international experts was offered to nearly 30 PhD students from within and outside Ethiopia. Both students and invited speakers expressed a high degree of satisfaction with the course. The organizers would be eager to offer a similar course in the future, and it is obvious that repeated and reliable offerings



Photo: Abigail Walters

Tadesse Amara, Pesticide Action Network-Ethiopia, conducting a class discussion.

could make this an important experience for many of Africa's future practising scientists and advisors. ■

Plant-microbe interactions – exploring microbes to improve crop productivity

A collaboration with Makerere University

Project leaders: Johan Meijer, Sarosh Bejai and Settumba Mukasa



Photo: Johan Meijer

The teacher Sarosh Bejai demonstrates the real-time PCR instrument.

Summary in Swedish

En forskarutbildningskurs om hur gynnsamma bakterier kan stärka grödor genomfördes i Uganda med deltagare från 11 afrikanska länder. Avsikten var att visa hur grödor kan gynnas av vissa mikroorganismer och hur man kan testa och utveckla sådana symbioser med enkla tekniker. Även studier för mer mekanistiska analyser behandlades för att kunna besvara mer specifika grundvetenskapliga frågeställningar. Kursen byggde på en blandning av lektioner, litteraturseminarier, gruppövningar, laborationer, dataövningar och studiebesök. Flera av doktoranderna har redan omsatt den nya kunskapen i befintliga projekt och uppföljning sker via internet.

Summary

A postgraduate course on how beneficial bacteria can strengthen crop plants was given in Uganda with participants from 11 African countries. The intention was to show how crops can benefit from certain microorganisms and how to test and develop such symbioses with simple techniques. Mechanistic analyses were also reviewed to be able to answer more basic scientific questions. The course was based on a mix of lectures, literature seminars, group exercises, laboratory work, computer exercises and field trips. Several of the students have already translated their new knowledge into existing projects and monitoring is done via the Internet.

Introduction

Agriculture is facing many problems

and future food production even more to ensure food security and food safety in satisfying increasing demands in a changing world. Crops that are more tolerant to stress would boost production. Plant breeding can improve properties of crops, assuming such traits are known and available in the germplasm but it is still a slow and expensive process. An alternative strategy is to use beneficial microorganisms that interact with plants and improve growth and stress tolerance. This is a simple, inexpensive and robust approach well-suited to small scale farming and local needs.

The course was given at Makerere University, Uganda, from 17–27 November 2014 at the Kabanyola field station campus and represented a worklo-

“Agriculture is so much more complex in Africa than in Sweden”

Interview

Johan Meijer – one of the project leaders



What are your most important reflections from the project? That agriculture is so much more complex in Africa than in Sweden and need more case to case attention. That cultural differences play a greater role in academics than anticipated. The generous attitude and social skills of the students to support each other was very satisfying and gave perspectives on our culture.

Did you create new networks during the project? Yes, with students that we are following up by SKYPE and email to solve problems they may encounter, guide on strategies and support project development.

Have any new skill, method, way of thinking or doing things come out of the project? I will incorporate more internationalisation aspects in my teaching at SLU and also address this more in writing of proposals and manuscripts. I have become involved in collaborative projects with African scientists somehow connected to SLU and also co-supervision of SLU students doing studies in Africa.

Would you like to share any unexpected experience? The practical shortcomings related to electricity, internet and maintenance was unexpected but we left the lab in much better shape than when we arrived. The positive attitude of the students and their strong commitment to make a change was very encouraging.

ad of almost three weeks for the participants. The 19 participants came from ten countries although most of them were studying at Makerere University.

Course objective

The course aimed to provide recent information concerning how microbes interact with plants and how beneficial microbes can promote growth and improve stress management, discuss strategies to develop systems, and provide a survey of information platforms and systems available for such studies.

Learning outcomes

After completion of the course the participant were expected to be better able to:

- understand and describe the basic factors that direct plant-microbe interaction with the focus on root tissue;
- plan and conduct simple experiments to study such interactions;
- know the basics of functional genomic bioinformatics and apply these in studies of gene homology and gene expression by interaction studies;
- receive comprehensive information and knowledge about possibilities and limitations to make cost-benefit analyses concerning exploitation of

microorganisms in crop production

- develop strategies to identify beneficial microorganisms that result in productive interactions with specific crop plants.

Course description and content

The course had 10 days of scheduled lectures, literature seminars, lab practical exercises, computer exercises, group exercises and a study visit. The course covered the following topics: plant nutrition and abiotic and biotic stress reactions; general plant-microbe interactions with an emphasis on microbes that promote the growth and stress tolerance of crop plants; gene expression and cell signalling during interactions including common techniques to study this; state-of-the-art functional genomics and bioinformatics tools to study interactomics. The practical topics included different procedures to illustrate the use of simple and advanced techniques to study interactions and what related common databases and tools are available.

The students gave presentations at the beginning and end of the course to familiarize everyone with the problems they were interested in and what was unique and unifying on different levels among the participants' topics. The initial presentations also gave the teachers opportunities to address some of the issues brought up during the course and to monitor progress until the last pre-

“My conclusion is that science is multidisciplinary.”

Interview

Blessing A. Odugwu – doctoral student



What are your most important reflections from the project? To make my research relevant I need to explore recent trends or techniques available for contribution to knowledge and impact in the lives of the end users of my research. For instance as a plant breeder I saw the need of incorporating the use of plant growth promoting bacteria (PGPB) to supplement my breeding program. These bacteria are the rhizosphere bacteria that can enhance plant growth by a wide variety of mechanisms like exhibiting antifungal activity, production of volatile organic compounds (VOCs), induction of systemic resistance, promoting beneficial plant-microbe symbioses, interference with pathogen toxin production etc. The potentiality of PGPB in agriculture has steadily increased as it offers an attractive way to replace the use of chemical fertilizers, pesticides and other supplements. This will require collaborating with experts in this field to achieve my goal. My conclusion is that there is no stand-alone science but that science is multidisciplinary. That means for me to attain my career goal, I need to collaborate with not only scientists in my area of specialisation but with others from other fields.

Did you create new networks during the project? Yes, I developed networks with some individuals (which included the facilitators). We have been sharing information on research funding opportunities and collaboration for further trainings and applications of the new technologies learnt during the course.

Have any new skill, method, way of thinking or doing things come out of the project? I have recently written a proposal on the use of RNA interference (RNAi) technology (taught during the plant microbe interaction course) to develop durable resistance to bean rust. This will be the first time RNAi technology will be applied in beans and a biotrophic fungus, *Uromyces appendiculatus*.

sentation. During seminars, students with more practical experience in for example extension were given room to explain small-scale farmers' attitudes, which was helpful for understanding intercultural dimensions and values in both academic and practical situations.

All teaching material from SLU teachers were available at the Fronter web portal and this tool was also used for lab and project reports to secure efficient course management.

Evaluations and lessons learned

Planning started during 2013 with outlining course contents, scope and pedagogical features. It was important to have a contact person with authority to handle local administrative routines and systems that seemed to be run in a top-down fashion. Also many teachers had other activities going on to support them economically making less time available for the joint course.

A planning meeting at Makerere University and a visit to the field station campus were made two months prior to the course to settle practical details and make sure premises, computer connections, staff etc. were available. The SLU

staff did most of the work of organizing, describing and outlining parts of the course while local practicalities were dealt with by the people at Makerere. The content of the lectures as the responsibility of the teacher in charge while the SLU staff planned the literature seminars, group exercises and practical exercises in consultation with the teachers at Makerere. However, several changes had to be made during the course due to practical circumstances. A number of unexpected power failures also made it necessary to improvise, which caused some delays.

The course lab was fairly well equipped and some additional supplies were brought from Sweden to make things run better. Some of these materials were left after the course to support other educational activities. In general, the exercises were planned not to be dependent on advanced equipment. The bioinformatics exercises also used easily available data sources and software that did not need powerful hardware or expensive licences. Some of the materials were shipped beforehand to have things ready at the start of the course but due to shortcomings in the local organization the full potential was not

"The training was very beneficial to me in terms of the skills and knowledge."

Interview

Emmanuel Afutu – doctoral student

What are your most important reflections from the project? The two weeks I spent attending the training was very beneficial to me in terms of the skills and knowledge I acquired during the period. Things which hitherto appeared complex and abstract (e.g. gene silencing or expression as a result of transformation) were broken down and made easy to understand.

Did you create new networks during the project? Yes, I created networks during the project. The aim for creating the network was to be able to obtain some guidelines in the area of my PhD research because the facilitators touched on some subject areas which were closely linked to my research. I recently used the network when I had a Viber (phone) call with one of the facilitators (i.e. Sarosh Bejai) to seek his guidance in the selection of some molecular markers for my research work.

Have any new skill, method, way of thinking or doing things come out of the project? Yes, I have started implementing new skills as a direct consequence of the project. Some of these skills include:

- a) Being able to do the extraction and quantification of the DNA of my samples without any assistance from anybody.
- b) Using the skills acquired from the bioinformatics sections/component to analyze my molecular data.

Would you like to share any unexpected experience? My unexpected experience was a positive one. That is, though I had finished the course work component of my doctoral training, I never had any practical skills in the field of Molecular or Biotechnology even though my programme of study for the PhD is Plant Breeding and Biotechnology. I had always lamented about this and was always scared of the molecular biology/biotechnology component of my PhD research and I never expected to have received that high level of training in terms of practicals in the area of biotechnology within a time as short as the two weeks within which the training was held.



realized.

Overall, the students' interest and commitment were impressive and they supported each other to explain different matters. The course evaluation was generally positive. The students' projects were followed up after the course using email and SKYPE to maintain momentum.

Teaching and learning considerations

The mixture of different educational forms seemed to work well to cover the themes and also help the students reach the learning goals by providing them with knowledge, tools and strategies for basic and applied work. Since elements of several disciplines were discussed during the course, and also to some degree integrated, this provided insights into differences in tradition and scholarly methods in different disciplines.

The students' oral presentations (with PowerPoint slides) and written reports also showed that they had grasped the novel information well and could integrate it into their own scientific areas and activities. Within the time frame given, this blend was a good balance. The students were overall good at presenting their projects with

clear, simple hypotheses and research questions as well as appropriate tools.

Having students from several countries and agricultural practices is in itself a great opportunity to get multifaceted inputs on food security and food safety issues. This was also a good basis for supporting the aim to obtain both local and global perspectives of the issues discussed.

However, differences in disciplinary backgrounds were in many cases not obvious since the course's theme was quite specific and had attracted students with similar interests and academic backgrounds. Many students had used the same English textbooks in classes in genetics, breeding, etc. at the master level, which contributed to homogenizing some differences in earlier education. A few students with a French-speaking background were less comfortable with English but the course gave opportunities to improve this.

According to the evaluation, many students were satisfied with the course, including the theory lectures and practical parts. The participants were positive as regards the practical sessions since these exposed them to molecular



Students and teachers in front of the Biotechnology laboratory.

Photo: Pauline Gibson

biology and microscopy techniques to which they had not previously been exposed.

Some of the students suggested a longer time for the course but this was due in part to the fact that they had not read the papers before the course and recurrent power failures sometimes made the days longer than planned, but also the fact that more information was provided per day than they were used to. Many students did not seem familiar with reading scientific papers critically, and another challenge was that they were not used to expressing their opinion on scientific matters. Perhaps their respect for foreign teachers increased their reluctance to express their opinions but the fairly informal interaction rapidly improved the latter challenge.

The cooperation gave opportunities to compa-

re academic traditions and attitudes to interaction with students. For example, the ambition to ensure that the students grasped things and to follow up loose threads and adjust coming lectures to earlier questions and to knowledge levels, differed between the traditions. The ambition to develop the students' ability to reflect and critically analyse matters and become more proficient in practical lab work also differed between the traditions.

Areas of improvement/Next steps

Based on the feedback and experience from this course, it is obvious that students need support in reading articles critically and expressing their opinions. They also had less practical experience from computer and wetlab work than anticipated

since they were used to demonstrations or presentations of simplistic problems instead of hands-on exercises. However, many of them seemed to grasp the theory satisfactorily. A web-based quiz before the course would give some hints as to the level of the students and possible adjustment of the teaching. A lab “driver’s license” should be taken on day one to ensure that students have basic lab proficiency.

The teaching material developed will be used in future courses given at Makerere and will therefore also be more widely used by other students.

The SLU teachers obtained a good understanding of the PhD training system and its conditions at Makerere as well as general African opportunities and problems. This is likely to lift the teaching at SLU and will contribute to improving internationalisation aspects of agricultural resource management.

Possible future impact on educational development

The course provided students from several countries with up-to-date information on how simple, robust technology based on local resources could improve crop production in a sustainable way. Follow-up meetings with the students will further increase their problem-solving capacity and improve their scientific skills. Finally, the course also initiated networks supporting food security aspects on both local and global levels.

The different teaching approaches have hopefully inspired the students to test alternative paths in their teaching. The challenges for agriculture in Africa demand the development of better tools for crop protection and to disperse the knowledge of them at both graduate and undergraduate level. The strong commitment shown by the students to improve agriculture and their positive attitude to new information and good social skills give great hope for future development. This course has contributed to capacity development and internationalisation of doctoral education at both universities. ■

Restoration of degraded semi-arid landscapes – livelihood, livestock and land use

A collaboration with Jomo Kenyatta University, the International Centre for Research in Agroforestry (ICRAF) and International Livestock Research Institute (ILRI)

Project leaders: Ewa Wredle, Gert Nyberg and Peter Mwangi

Summary

With this PhD course in Restoration of degraded semi-arid landscapes with focus on Livelihood, Livestock and Land use, we wanted to give young researchers an understanding of the multifunctionality and complexity of semi-arid rangelands. The course was held jointly by SLU and Jomo Kenyatta University of Agriculture and Technology, Kenya, from September until December 2014. This was a multidisciplinary course and the students were supposed to relate their own research topic to new insights and knowledge gained in the course. Field work was the core of the course and the students worked in pairs or small groups for most of the course. The core team of teachers knew each other before planning started and this was very valuable and also made implementation easier. Several challenges arose, especially during the practical part of the course, but all issues could be resolved and neither teachers nor students complained. The students appreciated the course very much and in addition to the actual learning goals that were fulfilled they now have a good network in the region as well as between Sweden and the East African countries.

Introduction

Pasture grasslands in arid and semi-arid lands are important for food security through a range of animal products. Many of the rangelands are however severely degraded as a result of reduced tree cover and soil organic matter due to overstocking, overgrazing and insecure land tenure. In these landscapes, productivity and multi-functionality need to be restored in order to secure livelihoods, sustainability and ecosystem services for a growing population. An increased need of resilience and climate/drought adaptation is also part of this challenge.

This multidisciplinary course with relevance for students in different disciplines such as animal science, soil science, agroforestry, ecology, agricultural economy, rural development, etc. focused on restoration, management and use of grasslands in semi-arid areas. The course was conducted in collaboration between Jomo Kenyatta University of Agriculture and Technology (JKUAT), the Vi-Agroforestry office in Kitale, and SLU (Department of Animal Nutrition and Management and Department of Forest Ecology and Management).

Twenty PhD students of eight nationalities came from 10 universities in six countries: Kenya, Rwanda, Tanzania, Ethiopia, Sweden and Uganda.

Course objective

The course aimed to increase understanding of the multifunctionality and complexity of semi-arid rangelands. Students were also exposed to future research areas of importance for food security. After finishing the course, the students were able to relate their new knowledge to their own research topic, but also to other disciplines in a multidisciplinary context. The students also gained insight and understanding in participatory methods and experience in using some of the methods. In addition, through small project assignments, the students did multidisciplinary analysis and reflection.

Learning outcomes

On completion of the course, participants were better able to:

- describe pastoralism and the multifunctionality of rangelands;
- describe grazing strategies and explain consequences of overstocking of animals;

Summary in Swedish

Torra och halvtorra tropiska regioner är utsatta för fattigdom och har en snabb befolkningsökning. En multidisciplinär doktorandkurs i restaurering av degraderade semi-arida landskap med fokus på levnadsvillkor, boskap och markanvändning utfördes gemensamt av SLU och Jomo Kenyatta University of Agriculture and Technology, Kenya. Kursen innehöll övningar, studiebesök och egna fältförsök och var utformad så att deltagarna kunde relatera insikter och nya kunskaper till sina respektive forskningsprojekt.

Även om de kursansvariga var rutinerade lärare och kände varandra väl så krävde utveckling och genomförande, och då särskilt av den praktiska delen av kursen, nya lösningar och anpassningar. Både lärare och studenter var mycket nöjda med kursen. Förutom att lärandemålen uppnåddes skapades både nätverk i regionen och mellan Sverige och länder i Östafrika.

"It is valuable to blend students from different countries and cultures"

Interview

Ewa Wredle – one of the project leaders



What are your most important reflections from the project? It is important to establish a friendly and open classroom environment to allow all students to give their point of view. I think we succeeded very well with this and all students in the group were active in the discussions throughout the course and they listened to each other's point of view. Equally important for us teachers was that the students felt trust and did not hesitate in arguing with us as well as their course mates. Another conclusion from the course is how valuable it is to blend students from different countries and cultures and how much added value this gives in discussions about various things. This is not only the case for the students but also for us teachers. I have learnt a lot during the course!

Did you create new networks during the project? Well, I have used the one I already had and it has deepened during the course planning and implementation.

Have any new skill, method, way of thinking or doing things come out of the project? I have used and extended my skills in some pedagogical tools for example an Internet based program (i.e. Fronter) where we communicated with the students.

Would you like to share any unexpected experience? Perhaps not unexpected but it became clear that many universities in African countries are suffering from a heavy bureaucracy that delayed and hampered many things.

- discuss animal husbandry and animal production in relation to sustainable intensification;
- describe, discuss and analyse co-benefits and trade-offs between desired landscape functions of different restoration methods/techniques;
- describe the drivers of vegetation changes;
- explain carbon sequestration in rangelands under different management regimens;
- use participatory research methods in practice.

Course description and content

The course, with a workload of seven weeks for the students, began in September 2014 with a streamed introductory lecture from SLU. The students then performed literature studies at their home universities. They met for the first time at JKUAT in Nairobi for two days of lectures and discussions with researchers from JKUAT, SLU, University of Nairobi (UoN), World Agroforestry Center (ICRAF) and International Livestock Research Institute (ILRI).

The practical part (field work) took 14 days and was very intensive with no free day at all. It was done in a "real case" in an area where restoration of degraded rangelands had been established at different times since the mid-1980s by Vi-Agroforestry (a local NGO) and is still going on. This gave the students a unique opportunity to learn

about processes and changes in rangeland restorations but also to relate their own research topics to a bigger picture. They visited and interviewed farmers in West Pokot and Kitale, collected some basic data and performed "transect walks". The outcomes of the field work were presented orally at a seminar. In addition, they drafted a feedback document of one page for the farmers/local NGOs and government extension officers. These documents will be translated into local languages (Pokot and Swahili), which will enable feedback to the communities and local leaders.

To pass the course, the student were required to participate in mandatory segments, carry out assignments during the course and present the outcome of the field work in a scientific report and a popular science article.

Evaluations and lessons learned

It was a great challenge to jointly plan and conduct this kind of course. However, both project leaders and teachers knew each other from a larger initiative (Triple L) in West Pokot where the field work was carried out. The planning of the course was done in a good and inspiring climate. The participation of Triple L and Vi-Agroforestry was crucial since they all have local contacts in the area that was needed for the different excursions and interviews.

“I created new networks during the project”

Interview



John Nyaga – doctoral student

What are your most important reflections from the project? Through the field visit I was able to appreciate limited natural resources in drylands and the effort by farmers in the areas to efficiently use the scarce resources to meet their needs which range from water, food, building materials, reasonable quality of life and to maintain the functioning of natural ecosystem on which they all depend. In the last 30 years, there has been increased land demarcations and establishment of enclosures as a way to mark ones' ownership or a pasture management practice. This was clearly observed during the field visits and interviews with

farmers. Establishment of enclosures in the area has curtailed the migratory tendency of the pastoralists during droughts and has a great ramification on both social and economic way of life for the local. This can be concluded as follows:

a) A diversification of economic activities with crop farming being taken up. This is in an effort to supplement income from livestock keeping. Also, favorable conditions created by improved soil and water conservation measures may allow growth of crop to maturity.

b) Men are now taking up other economic activities such as taxi drivers using motorbikes popularly known as boda boda and abandoning livestock keeping. However, it is women who are now taking up crop farming and also the reduced number of cattle, goats and sheep. There is change in gender responsibilities at the household levels.

c) There is also greater responsibility towards the land health as ownership became private as compared to communal. This was evidenced by tree planting, better pasture management and soil conservation measures.

Did you create new networks during the project? Yes. I created new networks during the project and the main one is for extending my current study to include dryland areas.

Have any new skill, method, way of thinking or doing things come out of the project? As a consequence of the project, I realized the importance of water in an ecosystem and I shall be evaluating the impact of selected tree species on water availability within smallholder maize production systems.

Would you like to share any unexpected experience? Through the project I realized the evolution of Pokot men (the main tribe). Traditionally, the men were pure pastoralists and in drought they would move with cattle leaving behind starving women and children. In current days, life is almost sedentary and the men are finding it tough to adjust to new way of life. Women on the other hand are more empowered even though with increased amount of work as they are in charge of crops and livestock.

The much appreciated, multicultural and multidisciplinary approach was created when teachers from SLU, two Kenyan universities, two CGIAR institutions and NGOs and officials from a local government in Kenya met with students with different research backgrounds, e.g. agroforestry, social sciences and agronomy.

Adaptive logistics (changing times, changing the schedule, finding alternative forms) had to be used extensively and it worked surprisingly well for teachers as well as students.

Teaching and learning considerations

During their field work, the students worked in pairs with a fellow student from a different country. We could see differences in how the students worked and interacted with each other and the farmers depending on their background.

The student group was gender-balanced but the paired groups were not balanced so some of the pairs consisted of two females or two males. This

had some drawbacks when the students were out in the field interviewing farmers as well as when they interpreted the data they had collected. The majority of the academic staff were men and none of the policy-makers and field officers were women, so more female teachers should have been involved.

During the course, several checkpoints were used to ensure that the students were active, e.g. they had to carry out various assignments throughout the course, and in order to participate in the practical part they had to submit a report. This resulted in some drop-off from the course. Some students dropped out after a month because they discovered that the course work took more time than they had expected. Further, some did not complete the assignments required to participate in the field work and thus dropped out at a late stage of the course.

According to the evaluation, the course fulfilled all the intended learning goals, and the overall



Photo: Ewa Wredle

Lunch break among cows.

evaluation score for the course was 8.1 on a scale where 10 represented excellent. The students felt that the course was an excellent beginning to establishing a network and developed an understanding of the multidisciplinary research, the semi-arid production systems and the potential for rangeland rehabilitation on the ecosystem and livelihoods. Lectures, field work and especially the participatory methods were considered to be very good and useful. The field work where the students met many farmers was particularly appreciated.

Due to bad Internet access or other internal restrictions at the universities, students from the African countries had problems accessing some of the information and literature that were uploaded on the Fronter web portal. Also, the streamed introduction lecture did not at all work out well due to bad Internet access for many of the students. Finally, students commented that some day off would have been nice as a rest during the very intensive 14-day field course in Kenya.

Areas of improvement/next steps

The course was very much appreciated and the students expressed a wish that the course should

be given again. We see, however, very small possibilities to run the course in the same way in the future. One of the things that made the course so good was that the students came from many different universities and countries and this was possible only because the course paid for travel and accommodation. But if it is run again we must find other ways to communicate with the students who do not have satisfactory Internet access. ■

Global challenges to food security: urbanisation, livelihoods and food security

A collaboration with University of Botswana, the EU-Africa Doctoral Student Network (DocLinks) and the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE)

Project leaders: Linley Chiwona-Karlton and Jose Jackson Maletle

Summary in Swedish

22 doktorander från Afrika och Europa deltog i en kurs om urbanisering, levnadsförhållanden och mattrygghet. Deltagarnas forskningsfokus varierade från klimatförändringen och dess inverkan på livsmedelsförsörjningen, livsmedelsvetenskap och nutrition, folkhälsa, kommunikation, växt- och djuravel, aqua-marina vetenskaper, förnybar energi, hälsa, vatten resursförvaltning till stadsutveckling och landsbyggdutveckling.

Kursen hade genus som ett övergripande deltema och syftade till att

- lyfta fram nya trender och tankar om urbanisering, försörjning och mattrygghet
- ge möjlighet för unga forskare från flera discipliner som arbetar inom området att nätverka med varandra för potentiella framtida samarbeten;
- stärka samarbeten för att öka förståelsen och etablering av ett starkare nätverk mellan afrikanska och europeiska doktorander.

Kursen var ett samarbete mellan institutionen för stad och land vid SLU och University of Botswana och partners och lärarna kom från alla organisationerna. Kursen bestod av både av enskilda förberedelser och efterarbeten men tre av de sju kursveckorna genomfördes ett kursinternat på University of Botswana. Med hjälp av föreläsningar, seminarier, grupparbeten och enskilda presentationer breddades deltagarnas perspektiv och förmåga att arbeta multidisciplinärt och förstå kopplingar mellan urbanisering, försörjning och global livsmedels-säkerhet.

Kursvärderingarna var positiva. De afrikanska deltagarna betonade att deras deltagande endast är möjligt om kursen kan stödja dem ekonomiskt med ersättning för resor, uppehälle och förlorad inkomst.



Students conducting field groupwork on super markets in Gaborone, Botswana..

Photo: Linley Chiwona-Karlton

Summary

The Department of Urban and Rural Development in collaboration with the University of Botswana and partners organised a seven-week doctoral course on Urbanization, Livelihoods and Food Security. The objectives of the doctoral course were three-fold: to highlight emerging trends and thinking about urbanization, livelihoods and food security; to provide the opportunity for young scholars from multiple disciplines who are working in the area to network with each other for potential future collaboration; to strengthen collaborative efforts for increasing understanding and establishment of stronger links between African and European doctoral education scholars.

Comprising a three-week residential face-to-face period in Botswana, 94 students applied for the course and 22 doctoral candidate students were selected and attended the programme. Students came from Europe and Africa and their research focus ranged from climate change and its impact on food security, food science and nutrition, public health, communication, plant and animal breeding, aqua-marine sciences, renewable energy, health, water resources management, urban development and rural livelihoods. Throughout the course, gender was discussed as an overarching sub-theme. Apart from the three members of the Swedish organizing team, all the resource tutors came from Southern African institutions. The course was positively evaluated; however, students indicated that financial support, especially for African participants, is necessary if their participation is to be optimized. Although gender was a cross-cutting theme in the programme, some participants had difficulties respecting different opinions, something that needs to be addressed in subsequent courses.

Introduction

Since 2010, the Department of Urban and Rural Development at SLU has actively been conducting research and exchanging teaching experiences with the University of Botswana (UB). A strong partnership has developed with regular exchange of students, teachers and scientists. The present joint venture was conducted as a full-time residential graduate course with a focus on issues of urbanization, livelihoods and food security. The course was offered as a joint undertaking between the Swedish University of Agricultural Sciences, the University of Botswana, the African Network for Agriculture, Agroforestry and

Natural Resources Education (ANAFE), the Association of Commonwealth Universities, the EU-Africa Doctoral Student Network (Doc-Links) and the Botswana Institute of Technology Research Innovation (BITRI).

The course comprised pre-course work as well as post-course work and face-to-face sessions were held in Botswana from 28 July – 8 August 2014. The total workload for the participants was seven weeks. A total of 94 applications were received and a final 22 selected participants from 13 countries in Africa (16) and Europe (6) attended the course.

Course objective

The objectives of the doctoral course were:

- to highlight emerging trends and thinking about urbanization, livelihoods and food security;
- to provide the opportunity for young scholars from multiple disciplines who are working in the area to network with each other for potential future collaboration;
- to strengthen collaborative efforts for increasing understanding and establishment of stronger links between African and European doctoral education scholars.

Learning outcomes

By the end of the three-week course students were able to:

- build new and strong networks for their professional development;
- understand the interconnections between urbanization, livelihoods and food security;
- apply a gender lens in their analytical work and decision-making;
- broaden their perception and skills of multidisciplinary approaches in research.

Course description and content

With its young population, it is estimated that Africa will have doubled its population by 2050. The course addressed current trends and such concerns as what will happen, what is already happening and how we can learn from what we already know to prepare for meeting the future scenario of a growing urban population. Some of the challenges highlighted included increasing animal source food consumption, malnutrition plus (overweight), malnutrition minus (under-nutrition), food security and climate change. ▶



Outdoor market in downtown Gaborone, Botswana.

Photo: Linley Chihwona-Karltun

Combining case studies and lectures, the course covered topics ranging from a global perspective using data and maps to grasp the processes of change and urbanization; factors pushing and pulling urbanization; effects and impacts; livelihood patterns and trends; future prospects for meeting change; transformations – land, diet, nutrition and health; mega-cities and mega-supermarkets; gender-urbanization, livelihoods and food security interface.

The target audience were doctoral students from Europe and Africa whose research focus ranged from climate change and its impact on food security, food science and nutrition, public health, communication, plant and animal breeding, aqua-marine sciences, renewable energy, health, water resources management, urban development and rural livelihoods. Throughout the course, gender was discussed as an overarching sub-theme.

Through individual presentations of their research topics and an interdisciplinary group project

that they worked on throughout the course, students were encouraged and supported to work together. This gave them the opportunity to learn more about each other, build networks and work away from their comfort zones. All presentations given in class as individual or group assignments were evaluated and students were given feedback in oral and written form. Some of the students expressed a need to have their papers published in the form of an edited report or book. The organizers approached SLU Global to determine if this could be an SLU Global report, but the proposal was declined. Other forms of publication are being explored at the time of writing.

Evaluations and lessons learned

The planning of the course began approximately eight months before its scheduled execution. There was one course convener from each of the countries/institutions. The conveners were supported by both course administrators and a senior scientist from each country. Planning sessions for the course took place through Skype meetings as well as email and telephone communications. In order to capture as many students as possible, the course flyer was circulated to several email lists and communities from December 2013 to May 2014. In all, 94 students submitted complete applications for the course online.

Apart from the supporting senior scientists, Professor Rodomiro Ortiz and the course administrator, Marta Zdravkovic, all the resource personnel were from the SADC region. This means that the content and examples were current and relevant to the theme and the region where the course was being held.

A selection committee comprising five people independently ranked the applicants for eligibility. This was based on the application, an abstract describing their research work and a motivational narrative as to why they wished to attend the course. All applicants had to be recommended by their supervisor and show proof of registration within the institute of study. Because the whole application process and submission was in electronic form with a closed zone for the facilitators, it was easy for the course team to follow the process of evaluating the applicants. A preliminary selection of 30 students was made. Due to increased costs of tickets and new rules for transit visas via South Africa for non-SADC member countries, both routing participants via other routes to Botswana and the need to purchase transit visas

affected the budget. As a result, not all of the 30 applicants could be offered bursaries, resulting in only 22 participants

Since SLU had an established long-standing collaboration with the University of Botswana, certain routines had been established, e.g. a memorandum of agreement was signed to clearly specify the roles of each institution. Nevertheless, the operation of activities against invoices differed immensely and funds had to be transferred to UB in advance to cover related activities such as booking of venues, transport, accommodation and travel for the resource personnel. SLU learned from its UB colleagues about hosting international students, for example having each student sign an indemnity form.

The course benefitted from the well-developed Internet connections on campus, high speed and accessible to all. UB has many international university exchange programmes, which made it easy for our students to feel at home, and the facilities were well maintained. In terms of pedagogical approach, the programmes were rather similar to the ones at SLU.

An unexpected major challenge was to anticipate the amount of time it would take to organize and arrange the practicalities around the course, in particular the resource personnel's and students' travel and visas. Locally, the rule of using established procedures to source services had to be observed. Unfortunately, the bus company hired proved to be inefficient and unreliable. This not only delayed some of the activities but also frustrated the students and the organizers, making the transport hire look unprofessional and out of the organizers' hands. This was also reflected in the evaluation.

As for the students, the evaluation showed that the majority rated the workshop aspects as very good and that most of the sessions were useful or very useful. The facilitators were highly appreciated, as well as the possibilities for professional development and networking. However, the evaluations indicated a need for improvements, primarily as regards transport and logistics issues and financial support for African students.

Teaching and learning considerations

The participating students were a diverse group in terms of ethnic background, education systems, and age as well as gender and study discipline. However, they did not differ much in their quest for knowledge or need for support. The

one thing that cut across was the need for financial support especially for students coming from Africa and based at African institutions. There were challenges in terms of working in groups, in particular gender issues and some participants having difficulty respecting the group members' suggestions and opinions. Gender appeared to be a challenge for some participants and this is where more work would be required in the future.

Impact of the course for SLU-UB and future collaboration

Before the course ended, partners from SLU and UB expressed the need to hold the course biennially with every other course in Botswana or Sweden. This was reiterated by the students as well. We hope to be able to find the funds to host this course in Sweden at SLU.

Both course conveners plan to continue to source funding for future joint courses. One of the things to explore in the near future is the Linnaeus-Palme teacher student exchange programme.

The three students from SLU, as well as the course administrator, gained insights into their research questions in the context of the Botswana government food security policies. Botswana aims to eradicate hunger by implementing food self-sufficiency strategies rather than importing food. This is very much in line with much of the current thinking and wider debate around food sovereignty. With global security under threat, countries like Botswana that have the means, are seriously recycling urban waste water and using it for large-scale food production in Gaborone. Similarly, the Botswana Meat Company is strengthening its ties with local community livestock farmers to ensure it meets the growing demand for animal source foods. ■

Global development, natural resources and livelihoods – a field course for master students

A collaboration with Kenyatta University and Embu University College

Project leader: Jan Lagerlöf



Photo: Jan Lagerlöf

Planning of group work.

Summary in Swedish

Tillsammans med Kenyatta University och Embu University College genomförde SLU en multidisciplinär kurs för mastersstudenter. Fyra veckorskursen syftade till att öka studenternas kunskaper och förståelse av socioekonomiska, ekologiska och miljövetenskapliga aspekter på naturresursanvändning och då särskilt livsmedelsproduktionen. Kursen har tidigare rapporterats i SLU-Global Report 2014:6 men på grund av att den även finansierades av det aktuella programmet, men då för att finansiera de Kenyanska deltagarna, så ingår kursen även i denna rapport.

Summary

Together with two Kenyan universities – Kenyatta University and Embu University College – SLU conducted a multidisciplinary four week MSc field course aimed at studies of the socio-economic, ecological and environmental aspects of the use of natural resources, in particular in food production. The course was mainly funded by the *SLU-Global Food Security Research and Capacity Development Programme 2012-2014*, and thus reported in the *SLU-Global Report 2014:6*. However, this programme *Innovative Doctoral Education for Global Food Security Programme 2013-2014* also funded the course – this time to

ensure the participation of Kenyan students. Consequently, a short description of the course and the results are also included in this report.

Aims

The aim of the course was to give the students in-depth knowledge of ecological and socio-economic limitations to the development and use of living natural resources. The course was multi-disciplinary and gave the students opportunities to see problems from many points of view and to test their theoretical knowledge in the real world. The agricultural and forestry sectors were in focus but with special

emphasis on food production.

Course description and results

The course consisted of one week of theoretical studies at the students' home universities and three weeks of field studies in Kenya followed by a few days of summing up of results and submitting reports. The 16 students (half from Kenya and half from SLU) worked in groups of two SLU and two Kenyan students. They collected information and tested their research questions on different aspects of the use and development of natural resources by interviewing farmers, representatives of different companies and officers from local governmental administrations, and were supervised by both SLU and Kenyan teachers.

The course programme also included field trips to a national park to study the importance of nature protection for tourism and water supply and studies of a Rift Valley lake where exploitation and conservation aspects are in conflict during the economic development of the area.

The students' achievements were presented in the form of oral and written project reports and individual excursion reports. The project reports were of high standard and the students had managed to design their work properly, collect and analyse data, and present their results well in oral and written form. The themes for the reports were 1) coffee production, 2) tea production, 3) fish farming, and 4) illegal logging. The excursions and field trips went well and gave new insights.

The course was very successful and according to the course evaluation, both the Kenyan and the SLU students learned a great deal and upgraded their skills and abilities in relation to the aim of the course. The multidisciplinary approach was appreciated and work in mixed group with students from other backgrounds was rewarding but challenging.

The outcome of the course was very positive and learning outcome as well as course administration were given the highest ratings in the course evaluation.

Collaborators

Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden
 Kenyatta University (KU), Nairobi, Kenya
 Embu University College (EUC), Embu, Kenya

SLU teachers

Jan Lagerlöf, course leader, responsible for ecological and natural science aspects

Oscar Jansson, deputy course leader, responsible for socioeconomic aspects

Emelie Zonabend, lecturer in animal husbandry

KU teachers

Michael Gicheru, leader of KU part, lecturer health and ethics

Pius Wanyonyi Kakai, lecturer Kenyan history

Fuchaka Waswa, lecturer society and nature

Kokwaro, lecturer natural resources

Lucy Kavinda, lecturer democracy, governance and development

Benson Mwangi, lecturer research methodology and natural conditions and land use

EMU teacher

Jamleck Muturi John, leader of EUC part and principal organiser of field activities

SLU students

Kristina Berglund, *Maria Kjellander*, *Elsa Lagerqvist*, *Clara Limousin* (France), *Martha Mancheva* (Bulgaria), *Nea Pakarinen* (Finland), *Emma Söderberg*, *Aksel Ydren*

KU Students

Brenda Akinyi (Kenya), *Joseph Kibe Karanja* (Kenya), *Reginald Kashakuro* (Tanzania), *Mark Sindeti M'masi* (Kenya), *Julius W. Teathon* (Liberia)

EUC Students

Alex Kipnyargis (Kenya), *Sammy Musyoka* (Kenya), *Evelyn Wambui Njogu* (Kenya) ■



2

Innovative doctoral education – training of transferable skills to build for tomorrow's research quality. A collaboration with Makerere University

Marabou storks (*Leptoptilos crumenifer*) on the roof of the Makerere University Library, Kampala, Uganda.
Photo: Lotta Hansson

Introduction

Lotta Hansson

Associate Professor, SLU

Programme Manager

SLU collaborates with several universities in Africa where the collaboration with Makerere University (MAK) in Kampala, Uganda, has a long tradition. The first Memorandum of Understanding, signed in 1992, describes areas of mutual interest and fields of cooperation, including joint research and publication as well as students and staff exchanges. SLU is also an active partner in the Swedish research collaboration with Uganda that was initiated in 2000 and is funded by Sida.

Both MAK and SLU offer their doctoral students courses in transferable skills. At MAK, they are called cross-cutting courses and at SLU general basic courses. Skills such as communication, leadership and teamwork are typical examples of transferable, or as they are sometimes known, generic skills. Of course doctoral students more or less already master some of these skills but a more systematic understanding and training adjusted to what is requested in future careers, is a relevant part of the doctoral education.

Cooperation on the joint development and implementation of a course for transferable skills training was initiated through contacts with the Director for Research and Graduate Studies at MAK, professor Mukadasi Buyinza. A set-up of doctoral courses for transferable skills training and adjacent workshops for senior staff was agreed upon. The courses focus on three areas: teaching and learning in higher education; scientific approach and ethics; information literacy and scholarly communication. Three teams of teachers/facilitators, one for each area, were appointed at both universities.

At two workshops, one at SLU in Uppsala in October 2013 and one at MAK in Kampala in February 2014, pedagogical strategies, forms for communication, time plans and course plans, intended learning outcomes, forms for exams and several other issues were discussed and agreed upon.

Each team of facilitators continued preparations between and after the workshops, while the Programme Manager and Director Buyinza found common principles for financing and arranging the courses and workshops at MAK twice during 2014 and an agreement was signed.

All events were primarily announced on the SLU Global website, and then announced (with links to SLU) on MAK's website. The announcement was also distributed using networks and contact lists. This was apparently successful since the SLU Global website had over twelve thousand unique visitors during the period 2013–2014 and almost all events attracted plenty of applicants.

The applicants registered through a web-based entry form and in addition to their contact details they also described their disciplinary background, pedagogical competence and experience and stated their reasons why they wanted to participate. The programme manager and Director Buyinza used this information as selection criteria to obtain gender-balanced, pedagogically engaged groups with participants who had experiences of relevance to global food security from different disciplines. When approving funding of the programme, the Swedish Ministry for Foreign Affairs expressed a desire to support the eastern African region in particular. Participants from MAK and the University of Rwanda, Jomo Kenyatta in Kenya and Sokoine in Tanzania were therefore given priority.

The directorate, and Mrs Carolyn Mirembe in particular, arranged all practicalities before, during and after the courses and workshops, including arranging housing, travel and reimbursement for the in all 210 participants as well as supporting the facilitators with adequate infrastructure and administrative service.

The *Transferable skills training for successful doctoral students* course consisted of:

- *Segment 1: Teaching and learning for doctoral students.*

- *Segment 2: Scientific approach and ethics for doctoral students.*
- *Segment 3: Information literacy and scholarly communication for doctoral students.*

It lasted for three weeks, one week for each segment, and was conducted twice – once in June and once in August 2014. A total of 54 doctoral students participated, representing six universities in eight countries.

The workshops for senior staff covered the following themes:

- *Improving and internationalizing university courses (3 days).*
- *Doctoral supervision (2 days).*
- *Scientific approaches and ethics (2 days).*
- *Open access and scholarly communication: Global and local perspectives (2 days).*

They were held twice in connection with the course. A total of 156 staff participated, representing several universities in eight countries.

Each team assessed their process of joint course/workshop development, planning and co-teaching a group of international participants with different disciplinary backgrounds. They were asked to discuss and report on working methods, the course content, teaching and learning considerations, lessons learned, areas for improvement/next steps and possible future impact on educational development.



Commentary

Mukadasi Buyinza

Professor, Makerere University

Director of Research and Graduate Training



I am honored to have this opportunity to share my views on the critical role of the Transferable Skills Training for Successful Innovative Doctoral Education for Global Food Security.

The Swedish University of Agriculture (SLU) in partnership with Makerere University (MAK) implemented a one-year Innovative Doctoral Education for Global Food Security project funded by the Swedish Ministry for Foreign Affairs. The aim of the project was to provide doctoral students with a solid pedagogical and research platform to support their role as current or future lecturers at their home universities under an overarching theme of joint development of internationalization and transferable skills.

The collaborative Transferable Skills Training for Successful Doctoral Students course consisted of three modules, namely; Teaching and learning in higher education; Scientific approach and ethics; and Information literacy and scholarly communication jointly developed and implemented by a competent team of resource persons from MAK and SLU. The training was conducted at the Centre for Agricultural Extension and Continuing Education (CAEC). The participants were drawn from universities in Kenya, Zambia, Nigeria, Ghana, Ethiopia, Rwanda, Tanzania and Uganda.

The major objective of the course was to equip the doctoral students with pedagogical knowledge and skills to effectively teach and train students in their respective universities with a local and global lens. The participants were taken through the program using active learning strategies like interactive lectures, group discussions, panel discussion, brain storming, role play, individual research and other cooperative learning strategies. Overall, the participation was very good. Participants' assessments revealed that the course was highly rated as very useful and offering important insights for lecturers in higher education.

However, from participants' comments and self reflection by facilitators, it was agreed that we needed to scale down on the content in some areas such as active learning strategies and assessment and to focus more on problems of delivering in large classes. Key lessons learnt include the importance of adequate preparation and harmonization of positions by facilitators and the use of a computer-aided learning management system was useful and the facilitators adequately complemented each other well. It was recommended that preparations for the next session needed to begin as soon as possible.

Furthermore, short-term workshops lasting two days were also organized for the senior academic staff which focused on the following areas: Internationalizing of higher education; Doctoral supervision; Scientific approaches and ethics; and Open access and scholarly communication: global and local perspectives.

156 university senior academic staff from partner public universities in the region attended the workshops. This achievement re-enforces the fact that Makerere University and Uganda in general have enjoyed and continue to benefit from the generosity of the government of Sweden in the areas of human resources capacity building, research, library services/information technology and infra-structural development.

This joint MAK-SLU doctoral training programme has been monumental and critical to the realization of our core functions of teaching and learning, research and innovations, as well as partnerships and networking. I am happy to verify that over 54 doctoral students and 156 academic staff were trained.

Insights and perception about possible future collaboration

In general, the courses and workshops were successful, as can be seen from the participants' evalua-

“The training created a good opportunity for the participants to better understand their research tasks and how to go about them when they return.”

tion reports. The participants were from Kenya, Tanzania, Rwanda, Ethiopia, Ghana, Nigeria, Zambia and Sweden. It was an enriching experience and the sharing from such a variety of cultures was very good. The disciplines were also varied, although the majority were agriculturally related sciences.

The training created a good opportunity for the participants to better understand their research tasks and how to go about them when they return, in addition to giving them good skills in pedagogy, information literacy, research, authorship and critical ethical issues related to research.

The rationale for the innovative doctoral education package was that the senior academic staff who play a role in a context made up of several activities, all of which are aimed at attaining the goal of allowing the doctoral students to acquire the knowledge and skills needed to carry out research independently. The activities included, among other things, teaching, supervising, counselling, and managing the graduate research exercise. Any intervention aimed at professionally building one’s capacity should therefore cover much more than training in pure research and in supervising students’ dissertations. Lecturers need to have knowledge and insights broad and deep enough for them to be able to support the doctoral students in all aspects of the study programme. For example, doctoral supervision is a very special relationship between a doctoral student and a supervisor. It is often a relationship between two individuals where one has the advantage of being in a formally superior position, while the other finds him/herself in a dependent position. It is crucial to be able to handle differences of opinion without causing conflict to handle the dynamics of a prolonged process. A course aimed at supporting the supervisor must therefore contain a substantial part where knowledge of interaction in dyadic situations and conflicts, and handling of conflicts is the main theme. This in turn requires that one or more professional individuals be engaged to lead these course elements in a collaborative manner.

Quality assurance and quality enhancement at any university should prioritise the senior academic staff and their professionalism – assuming that the doctoral students admitted have the proper background and competence for higher studies. The academic staffs need continuous support in their efforts to develop this professional role. It is not a question of training only the new lecturers, it is also a question of lifelong learning. In view of the fact that new pedagogical approaches are coming up concerning issues of scientific approach and ethics, teaching and learning (pedagogy) and supervision, there will always be need to update and refresh their skills through short-term skills enhancement workshops.

There is a need to integrate international activities such as capacity development, joint international initiatives (staff exchange and shared doctoral courses, co-publication, and joint examination and awards) in the existing model and in the overall strategy of internationalization.

The MAK-SLU innovative doctoral education training became an opportune moment to re-learn how to work on a cross-disciplinary platform, also for a significant duration of field-based research. The significant shift from single-individual-based teaching mode to the integration of the expertise from both North and South universities within the broader doctoral education programme to the student, academic staff, institutional and national level is itself appreciated as an invaluable lesson and opportunity, as well as a challenge. The significant qualitative gain from such a vital undertaking is well-cherished by all the various stakeholders.

Future perspectives

1. Collaboration is important in graduate research training and hence we need to build research collaboration networks.
2. Global learning and internationalization: Our research environment is becoming increasingly global, our students increasingly diverse, and our research topics increasingly interconnected. Therefore, we need to work on internationalizing our academic and research systems. How do we teach students from all over the world and make the content relevant to each of them? How do we handle a global classroom?
3. Supervising doctoral students is a specialized skill and we therefore need to invest substantial resources in supervision skills enhancement. Given our diversity, we need to discuss and agree on what characterizes a professional, ethical and responsible supervisor.
4. Academic staff should undertake a mandatory supervision course (both senior and emerging researchers). Regardless of past experience, under this new arrangement, no staff shall be appointed to supervise graduate students without a valid supervision certificate. We need to redefine the role of the supervisor and find alternative paths to enhance the supervisor-candidate relationship.
5. The universities' educational development divisions should be strengthened to be able to offer timely pedagogic/teaching in higher education to all teaching staff. We need to critically assess teaching and reflect on the different approaches to teaching. All academic staff must be trained in teaching and learning methods and other pedagogical skills relevant to higher education systems. The College of Education and External Studies will play a leading role and help develop the required curricula to address these and other salient skills, e.g. grading and assessment.

Above all, the programme proved to be an opportune learning process and also a meaningful and worthwhile experience. Senior staff members were taken back to the classroom, built their capacity to collaborate and network, and have also been able to supervise and mentor PhD students.

To conclude, it is heartwarming to report that we successfully developed and implemented the joint curricula and I want to thank the Swedish government for their continued financial support to Makerere University, in particular in the areas of building capacity and improving the environment in support of graduate research training. The Sida funding is by far the largest support given to graduate training at this university. A number of our staff have received skills enhancement training through Sida funding.

I also wish to thank the Vice-Chancellor of Makerere University for the patronage and guidance received during the planning and implementation of the collaborative courses and workshops.

Through the current programme, Makerere University has continued to enjoy an excellent working relationship with the Swedish University of Agricultural Sciences. This connection has been nurtured and I am happy to have been part of building this deepened relationship.

Transferable skills training Segment 1

Project leaders: Natalie Jellinek and Joseph Oonyu



Activities held outside during the *Transferable skills training*, Makerere University, Kampala, Uganda, 2014.

Summary in Swedish

I juni och augusti 2014 planerade och genomförde pedagogiska utvecklare från SLU och Makerere University gemensamt två doktorandkurser. Kurserna syftade till att styrka deltagarnas pedagogiska kompetens och att stödja dem i deras kommande uppdrag som lärare på sina hemuniversitet. Deltagarna kom från både östafrikanska universitet och från SLU.

I anknytning till kurserna genomfördes även två workshops för erfarna lärare: *Improving and internationalizing university courses*. Det huvudsakliga syftet var att bidra till en förstärkt internationalisering inom undervisning, ett ämne som blir allt mer relevant inom högre utbildning. Dessutom gav workshoppen en möjlighet till att bygga regionala nätverk för erfarna lärare.

Summary

During June and August 2014, a team of facilitators from SLU and Makerere University (Uganda) organised two courses for doctoral students, with the aim of providing them with a solid pedagogical platform to support their role as current or future lecturers at their home universities. Participants came from both East African universities and SLU.

In connection with the courses, two workshops for senior lecturers, entitled *Improving and internationalizing university courses*, were also conducted. The main aim of this initiative was to contribute to the further internationalization of higher education curricula, a topic that is becoming increasingly relevant in higher education. In addition, the workshop also enabled the creation of a regional network of senior lecturers.

Teaching and learning in higher education for doctoral students

Introduction

Many university lecturers today are researchers who also teach. However, many of them do not feel appropriately prepared to teach undergraduate students professionally. Very often, PhD students are engaged as university lecturers in undergraduate education and should therefore have a solid foundation in their new positions. A course in university pedagogy gives them the possibility to gain skills in academic teaching and after completion of the course can feel more confident in their future roles. The course is then an important first step in their teaching careers.

The teaching and learning segment was the first of three segments in the three-week course *Transferable skills training for successful doctoral students*. The course was conducted in June and August 2014.

Course objective

The aim of this segment was to provide doctoral students with a solid pedagogical platform to support their role as current or future lecturers at their home universities.

Target group

The target group for this one-week segment were doctoral students active in the area of global food security, both at SLU and participating partner universities. Doctoral students from outside East Africa were also welcome to attend. Priority was given to those engaged in teaching and among those to female doctoral students. Most of the participants had never received training in educational pedagogy; the potential to reach many more doctoral students beyond those in the Food Science realm is immense.

Intended learning outcomes

Upon completion of this segment, the participants were expected to be better able to:

- reflect about their role as lecturers in their own university context;
- formulate their own educational philosophy statement;
- report on learning theories and global contemporary trends and issues in higher education;
- apply the theory of constructive alignment in

the preparation of a university course, justifying choices;

- justify choice of instructional strategy aimed at facilitating active learning in different contexts;
- discuss and evaluate how to integrate Education for Sustainable Development (ESD), as linked to global food security, into higher education pedagogy;
- discuss and evaluate how to integrate a gender, diversity and internationalization perspective into higher education pedagogy.

Course description and content

The course lasted five full days and included lectures, discussions, group work, and peer and group reviews.

The following subjects were covered:

- development of intended learning outcomes
- instructional strategies
- learning styles
- methods of assessment
- education for sustainable development, gender consciousness, and internationalization
- teaching large groups
- departmental culture and student support
- critical incidents and education philosophy statements.

The participants were taken through the programme using active learning strategies like interactive lectures, group discussions, panel discussions, brainstorming, role play, individual research and other cooperative learning strategies. A compendium of materials was distributed to all participants.

Teaching and learning considerations

Internationalisation

Internationalisation as a topic was covered in the course and participants were given time to reflect about the issue in both a national, regional, and global context; gender and education for sustainable development were also included in the course content and discussed in much the same way. A key concern of this course was the inclusion of local examples and cases to try to make connections to the everyday lives of participants

so that the issues could be best integrated into their own experiences.

Team teaching

There were six facilitators, two from SLU and four from Makerere University. The fact that the facilitators came from different countries and thus from different disciplines/educational backgrounds was clearly enriching and not only appeared as a positive aspect in the course evaluations, but was also a benefit experienced by the whole teaching team. Facilitators from different educational systems did not hinder the free flow and interaction between them that led to successful co-presentations. In this regard, differences in teaching styles between the different facilitators can be considered a strength since participants were exposed to a variety of teaching styles from a diverse set of perspectives, both cultural and disciplinary.

Results

The sixty participants in the two sessions were drawn from universities in Kenya, Zambia, Nigeria, Ghana, Ethiopia, Rwanda, Nigeria, Tanzania, Uganda and Sweden.

In their comments, many participants noted that what they most appreciated was the participatory nature of the course and discussed the transformative process of teaching and learning:

“It is an opportunity so great for any young career like mine”

“I enjoyed the course immensely and now understand better how I can contribute effectively to the body of knowledge”

“I am grateful for this course. I believe the change it has made in my profession will leave an impact in my life”

“I am very happy having attended this course. I feel I am a better teacher than the way I came. I promise to deal with students in a better way and I believe I can now produce life-long learners”

The majority of participants were of the view that the course was very useful and relevant to both their personal and professional development. They rated each of the various training sessions as *Very Good* to *Excellent*.

Future impact

Invest in networks

An important network was created during the training: doctoral students from different countries and disciplines were able to share their experiences and learn from each other during an intense three weeks. A key aspect of this project’s sustainability would be to establish ways to guarantee durable networking opportunities for this newly-created group.

Training leadership/mentoring

Participants repeatedly pointed out the need for training decision-makers at their home universities, including policy-makers. Those in charge of planning programmes and courses, making the financial decisions, deciding on pedagogical strategies and curriculum content should be sensitized towards a more flexible student-centred approach to teaching and learning. This is one of the ways in which structural problems might be addressed by training members of the university’s management hierarchy.

Continued capacity development

The need for targeted and conscious capacity development remains a key challenge at many of the universities involved in this project.

In addition to training in teaching and learning for doctoral students, one of the main areas of interest is the training of doctoral supervisors, as supervisors do not usually receive training before being assigned to be supervisors.

Materials: contextual and relevant

The issue of production of contextual and relevant teaching materials was also discussed and highlighted as a main challenge for many instructors and is potentially an important future area of focus

Names of the staff members who facilitated the course

Betty Ezati, Natalie Jellinek, John Okiror, Charles Opolot-Okurut, Joseph Oonyu and Peter Aspengren.



Improving and internationalizing university courses – a workshop for senior lecturers

Introduction

It is essential for experienced university teachers to exchange experiences in order to continue to develop. As a senior lecturer you have the opportunity to put your education in a broader context and integrate the major issues into your courses. You should base your teaching on several key perspectives such as internationalization, gender equality, and sustainable development. In this particular case, participants were given the opportunity to immerse themselves in one of these perspectives – internationalization.

The SLU-MAK teaching and learning team conducted two workshops designed for senior lecturers with a focus on internationalizing course content. The workshops were held in June and August 2014 at Kasangati Resort near Kampala in Uganda.

Workshop objective

The two workshops focused on providing senior lecturers with the knowledge and skills they need to develop courses in the context of internationalization.

Target group

Participants in the workshop were senior lecturers with teaching experience and course responsibility, active at MAK partner institutions in the field of global food security and interested in infusing an internationalization perspective into their current courses. They were seasoned instructors with several years of teaching of experience and also some level of administrative responsibility. Most were responsible for courses, sat on decision-making boards, and had some degree of freedom to undertake curriculum reviews.

Intended learning outcomes

Upon completion of the workshop, the participants were expected to be able to:

- reflect about their role as a lecturer in their own university context;
- apply the theory of constructive alignment in the preparation of their courses, justifying choices;

- justify choice of instructional strategy aimed at facilitating active learning in different contexts;
- integrate an internationalization perspective in the preparation of his/her courses.

Workshop description and content

The workshop included:

- constructive alignment and development of intended learning outcomes
- methods of assessment
- internationalization of courses
- teaching large groups.

Teaching and learning considerations

Regional heterogeneity

There was great heterogeneity in terms of use of pedagogical concepts and assessment practices. All participants reflected on the importance of internationalization in their own university context and interpretations and concrete applicability of policies varied greatly from case to case.

Incompatible systems

Participants sometimes faced the challenge of reconciling university systems that did not have a single way of approaching various teaching and learning issues, causing confusion and sometimes a lack of compatibility between what is expressed.

Structural vs individual challenges

Many times, instructors had difficulties finding strategies for dealing with issues that seem impossible to resolve at the individual level. It was thus important for the session to identify different areas of action and spheres of influence such as what an instructor can do in his/her own classroom and what can be done at the course/programme/department and institutional levels.

Results

There were 20 and 30 participants at the June and August workshops, respectively. They were drawn from universities in the region: Kenya, Zambia, Nigeria, Ghana, Ethiopia, Rwanda, Tanzania and Uganda.

Active networks

The workshop participants were willing to continue the cooperation and were perhaps more accustomed to creating networks than their doctoral student peers. They were quick to create fora for exchange and continue communication. What was most appreciated was the introduction of new concepts such as internationalization and constructive alignment:

“The necessity for constructive alignment and the urgent need to internationalize the courses given the [global] village nature of the world”

Participants highlighted the importance of raising discussed issues to higher levels of authority:

“Diversification of participants: at least higher education policy makers should be involved. Advocate the issues with my home university, ministry of education, policy makers and other concerned bodies”

“Involve members of the University Board of management (person in charge of curriculum) so that implementation is effective”

Concluding remarks

This workshop proved that internationalization is indeed a topic that is becoming increasingly relevant in higher education globally while at the same being difficult to implement or translate from mission and vision to the work of a lecturer.

All of the universities represented work with internationalization in some kind of way, yet it differs greatly from one context to another. The way in which universities work on educational development issues also varies greatly and can sometimes be a challenge, for both the lecturers themselves and for people developing relevant and informative training content.

Given the purpose and focus of the course on curriculum development, there is likely to be a need for institutions to review their existing programme/course curricula in order to integrate internationalization aspects and review teaching methodologies. These changes will require administrative and resource support, which is why, as mentioned earlier in the case of the PhD course, it is imperative to put forward these issues and sensitize university management and policy-makers.

Names of the staff members who facilitated the workshop

Betty Ezati, Natalie Jellinek, John Okiror, Charles Opolot-Okurut, Joseph Oonyu and Peter Aspengren.



“This workshop proved that internationalization is indeed a topic that is becoming increasingly relevant in higher education globally”

Transferable skills training Segment 2

Project leaders: Per Sandin and Wilfred Lajul

Summary

Over the course of a week doctoral students with different disciplinary and national backgrounds trained understanding of approaches in different fields of scholarship and the ability to conduct an ethical assessment in a scientific context.

In a two-day workshop senior staff trained supervisors of doctoral students in philosophy of science and research ethics.

Summary in Swedish

Under en vecka tränade doktorander från olika discipliner och olika länder på att förstå vetenskapligt förhållningssätt som det tillämpas inom olika discipliner samt att göra etiska bedömningar i vetenskapliga sammanhang.

Under en tvådagars workshop diskuterade senior akademisk personal, det vill säga lärare och forskare, vetenskapsteoretiska och forskningsetiska frågor från ett handledarperspektiv.



Course participants.

Scientific approach and ethics for doctoral students

Introduction

The *Scientific approach and ethics* segment was the second of three parts of the three-week course *Transferable skills training for successful doctoral students*. The course was conducted in June and August 2014.

Irrespective of research subject and discipline, doctoral students need a thorough understanding of the concepts of science and knowledge as well as an awareness of ethical questions relevant to science and how to consider these in the different roles of researcher, teacher, supervisor and administrator. Considering for instance the current debates on pesticide use and genetically modified crops, the segment has high relevance for food security and related fields.

This interdisciplinary segment was directed at doctoral students in both humanities and sciences working in the field of global food security. It enabled students to widen their understanding of science, knowledge and research and intensify their basic approaches towards research.

Objectives

The objectives of the segment were to provide an understanding of different approaches in different fields of scholarship, equip participants with the ability to conduct an ethical assessment of research, provide skills in solving research problems in

national and international contexts, and relate the above to food security issues.

Learning outcomes

After having completed the segment, the participants are expected to be able to:

- suggest a suitable scientific approach in relation to the research topic at hand;
- recognize the different knowledge interests in research activities;
- identify causative/correlative and explanatory/predictive relationships between research problems and theories;
- discuss ethical concerns in research on humans and animals and societal consequences of science;
- justify decisions on authorship credit with reference to acknowledged international codes;
- critically reflect on their own research activities in terms of outcomes.

Description and content

This segment was based on existing courses at both Makerere University and SLU (Philosophy of Method and Research Ethics, respectively). Combining the topics was very fruitful and gave opportunities for intellectual cross-fertilization. ►

Universities, including SLU, appear to be opting to an increasing degree to treat methodological/philosophical and ethical issues jointly. We believe in the potential of this approach.

The segment was held at MAK’s Continuing Agricultural Education Centre (CAEC) in Kabanyoro, north of Kampala, over five full days of lectures and interactive workshops. The segment covered such topics as patterns of reasoning and research strategies, aspects of knowledge, theoretical and conceptual frameworks, science and ethics, and scientific innovations as a critical dissection.

A large part of the segment involved group and plenary discussions, during which participants and teachers generously and with great insight shared experiences, thus highlighting both their common background in research related to global food security and agriculture as well as their respective differences.

In order to provide scope for a multitude of views and perspectives the facilitators came from both universities and had different disciplinary backgrounds.

Evaluations and lessons learnt

Planning began in autumn 2013, initially by means of e-mail exchanges between MAK and SLU contributors. Course planning kick-started during the February meeting at MAK, and the bulk of the planning work was carried out there. The teachers mostly collaborated in pairs on their respective topics. The opportunity to actually meet in person was very highly valued by the collaborators. Unfortunately, the remaining planning did not quite work out as hoped and some issues (e.g. examination form) had consequently not been fully settled when the segment began. Some facilitators also had to withdraw from contributing to the teaching, which led to some rearrangements. Evaluation of the segments was carried out continuously by Dr Lajul with the aid of the eminent administrative staff from MAK.

The main lesson learnt from the teachers’ and segment organizers’ point of view is the importance of adequate planning. Perhaps the amount of time for physical meetings well in advance of the segment was underestimated. There were also some practical details (e.g. interruptions in Internet access and electric power supply) that required teachers to plan ahead for such contingency. Unfortunately no SLU students participated, possibly due to short planning time and less than optimal recruitment efforts.

Teaching and learning considerations

Students faced teachers with different teaching styles, which can be both challenging and enriching. The participants in the segment showed impressive determination and were very active in taking charge of their own learning. Some differences between SLU and MAK teachers (and students) regarding the length of lectures and the frequency and length of breaks were also noted.

Areas of improvement/next steps

After the first run of the segment (June) we noted that one very concrete point for improvement would be to provide clear and comprehensive information to the students beforehand. A memo indicating literature, examination, etc. could be sent out before the start. At the start of the segment the students should be given an information pack containing all required reading. More participation by facilitators at each other’s lectures would also be desirable. Finally, the course would benefit from further coordination of topics between facilitators in order to allow them to better connect their presentations to those of other facilitators and avoid some potential instances of repetition. These suggestions were implemented the second time the segment was held. The main impact of the education for the future will likely be through teachers’ increased awareness of each other’s teaching methods. Teaching materials (lecture notes, presentations, etc.) were also exchanged, allowing teachers to better connect to the theme of food security.

Possible future impact on educational development

On the part of SLU teachers, the added value in this respect was experience of teaching students from different cultural and educational backgrounds with a very wide array of competences. Unfortunately no students from SLU participated, which would have been desirable and which would have further strengthened the forward-looking aspects of the projects. Further, a closer connection between ethics/philosophy and the students’ fields of study would improve the usefulness for the students and their possibility to see links to their own work.

Names of the staff members who facilitated the course

Rolf Johansson, Edward Wamala, Wilfred Lajul, Per Sandin and Mukadasi Buyinza □

Scientific approach and ethics – a workshop for supervisors of doctoral students



Kasangati, Kampala. Makerere University College. Rolf Johansson (SLU), Per Sandin (SLU) and the participants in the course Scientific Approach and Ethics.

Introduction

The reason for arranging the workshop was a perceived need for increased training in philosophy of science and research ethics for supervisors of PhD students. The topics are of relevance to food security and related fields (e.g. pesticide use and genetically modified crops). To a large degree the topics overlapped with those of the PhD course in Scientific method and ethics, but they were approached from a supervisor's perspective. The facilitators are aware that supervisors often lack opportunities for sharing experiences with other supervisors, and therefore an important focus of this workshop was to provide such opportunities in an open discussion climate. The workshop was held in June and ran for two full days at the Kasangati Resort Centre, north of Kampala. The planned August workshop had to be cancelled at a rather late stage due to lack of participants.

Working methods

The participating facilitators came from both universities. The workshop was planned in a process parallel to that of the PhD segment on

Scientific method and ethics, which meant that the bulk of the planning work was carried out during the February meeting at Makerere University. This opportunity to actually meet in person was greatly appreciated by the collaborators and is recommended for future work. Planning then continued through e-mail exchanges, which must be regarded as a less-than-optimal method. For the future, greater use of IT aids (e.g. Dropbox, Fronter or similar e-learning systems, and video conference) would be advisable.

Content

The topics covered were research strategies, creativity in research, principles of research, knowledge and knowledge types, and ethics in research and publication (authorship issues including publication strategies). The segment ended with a general discussion on supervision issues with all teachers participating.

Teaching and learning considerations

Most of the segment involved discussions, during which the participants and teachers shared expe-

rience, based on their responses to in-class tasks and questions provided by the facilitators. Since the number of participants was small, most discussions were held ‘in plenary’, led by facilitators taking turns. The discussions were very fruitful because of the participants’ engagement. However, they take a great deal of time. We believe that allocating enough time for each task is essential and there might be room for improvement here.

Evaluations and lessons learnt

The main lessons learnt were that the workshop might need even more focus – the topics covered are broad and invite a great deal of discussion, which means that the time management issue will be critical. Perhaps some topics could be merged or some items dropped to allow even more depth in the discussions.

We also experienced some difficulties in recruiting participants, an issue which must be considered seriously. One explanation might be that supervisors are typically very busy but also once they have allocated time for participating in exercises of this kind usually find it rewarding and useful in their professional lives. One possibility is therefore to include the topics in some form of de facto compulsory training that a supervisor must have to become principal supervisor for a PhD student, as is the practice for example at SLU.

The announcement of the workshop probably did not appeal to the supervisors. Therefore, a possible suggestion would be that the name of the workshop be changed to ‘Supervisors’ workshop on scientific approaches and methods’. To make it more cost-effective, instead of conducting the workshop only for two days, we could hold the training twice in the space of one week with two different sessions, one from Monday to Tuesday and the second from Thursday to Friday. A new advertising strategy should also be designed.

Next steps and possible future impact on educational development

The future impact at MAK will likely be the availability of a greater number of appropriately trained supervisors. Educational materials were also exchanged between the facilitators. We believe that there is a need for workshops of this

kind, since the topics are relevant for all supervisors, not only those working in the field of food security.

Unfortunately, no SLU supervisors participated. This would moreover have been difficult due to the distance and the short duration of the workshop. However, for the future, opportunities for such exchanges would be highly appropriate if they can be arranged in a resource-effective way. An attractive scenario would be to have both a few SLU PhD students participating in the segment and their supervisors participating in the workshop.

“We believe that there is a need for workshops of this kind, since the topics are relevant for all supervisors, not only those working in the field of food security.”

Names of the staff members who facilitated the workshop

Rolf Johansson, Edward Wamala, Wilfred Lajul, George Nasinyama, Ferdinand Mutaawe Kasozi, Per Sandin and Helena Röcklinsberg

Transferable skills training Segment 3

Project leaders: Charlotte Håkansson and Maria Musoke



Photo: Moa Hedbrant

Outside the Makerere University Library.

Summary

The university libraries of Makerere University and SLU together planned and conducted two courses for doctoral students in *Information literacy and scholarly communication* at Makerere University. Facilitators from both universities trained doctoral students with different disciplinary and national backgrounds in information retrieval and communication. The cooperation resulted in a more common view on curricula, pedagogics and assessment as well as an inclusion of international perspectives in the education. According to the course evaluations the expectations of the participants were met.

Also two workshops about open access

and scholarly communication were performed. The workshops included presentations, open discussions, thematic group discussions, and hands-on exercises. The key issues surrounding the open access movement and what it means for researchers, information professionals and research institutions were discussed. Steps of developing and implementing an open access policy were outlined.

Summary in Swedish

Biblioteken på Makerere University och SLU genomförde tillsammans två doktorskurser om *Information literacy and scholarly communication* på Makerere University. Lärare från båda universiteterna tränade doktorander med olika disciplinära och nationella bakgrunder i informationshantering och kommunikation. Samarbetet innebar att en mer gemensam syn på kursplan, pedagogik och uppföljning utvecklades samt att internationella perspektiv inkluderades i undervisningen. Kursutvärderingarna visade att deltagarnas förväntningar hade infriats.

Dessutom genomfördes två workshops om open access and scholarly communication. Med hjälp av presentationer, diskussioner i plenum och mindre grupper utvecklade deltagarna, seniora akademiker och bibliotekarier, sin förståelse av open access och dess betydelse för forskare, informationsansvariga och universitet. Under workshoppen diskuterades olika sätt att utveckla och implementera en open access policy.

Information literacy and scholarly communication for doctoral students

Introduction

The *Information literacy and scholarly communication* part was the third of three segments of the three-week course *Transferable skills training for successful doctoral students*. The course was conducted in June and August 2014.

Scientific information is available in variable forms and through multiple channels. The uncertain quality and expanding quantity of information pose a large challenge. It requires a complementary cluster of abilities necessary to use information effectively. An information literate individual is for example able to:

- determine the extent of information needed;
- access the needed information effectively and efficiently;
- evaluate information and its sources critically.

Outcome from the content of the course covers the essential parts of the definition of information literacy.

The libraries of Makerere University (MAK) and SLU both have informational literacy programs that are aimed at enhancing access to the wealth of information resources and putting the skills of research publishing strategies within their reach. Makerere University library (Maklib) annually runs two major information literacy cross-cutting courses:

- Information competence and management: a graduate cross-cutting course
- Digital literacy (formerly *Learning and teaching in a digital world*)

Likewise, the SLU library has been running the PhD course "Information retrieval and methods of scientific communication".

Librarians from Maklib and SLU library reviewed the content of their respective information literacy course between September 2013 and June 2014 in an attempt to find synergies and develop the joint doctoral item *Information literacy and scholarly communication* (ILSC), which was conducted twice in 2014, i.e. in June and September/October.

Objectives

The aim of the segment was to contribute to the development of high-level collaborative and international research by training information competence and scientific communication skills and knowledge.

Learning outcomes

After completing the segment, the participants are expected to have acquired durable information skills and knowledge and be better able to:

- plan and perform literature searches;
- critically evaluate literature search results;
- evaluate information and its sources critically;
- interpret the conditions and patterns of scientific publishing, including the use and limitations of bibliometric tools and methods, copyright and intellectual property rights;
- apply web tools for communication and collaboration in academic work;
- use basic functions in a reference management software to create a collection of references relevant to participants’ research topics.

Description and content

The course was held at Maklib over five full days of lectures and interactive workshops. The hands-on (practical) nature of ILSC necessitated that it be conducted in a computer laboratory with reliable Internet connectivity because it mainly focused on promoting access to and the use and management of electronic information alongside traditional/print resources that support teaching, learning and research.

The segment covered essential components of the search process in relation to information literacy and scholarly communication:

- qualities of a good research article, critical and analytical reading
- search strategies and search process
- international and institutional online databases (e-journals, e-books), awareness of access conditions, document delivery services, etcetera

- other resources (print and non-print)
- social media, web tools for communication and collaboration
- professional citing and quotation and reference management
- scientific communication, open access. strategic publishing including bibliometrics.

ILSC was conducted mainly by hands-on instruction with theoretical instruction. This called for full-time participation/commitment by the entire team of facilitators. Whereas each module had two lead co-facilitators from Maklib and SLU, the rest of the team participated in providing hands-on (computer-based instruction and discussion) support to the participants. Pre-course assignments decided in planning were also distributed to all participants.

Evaluations and lessons learnt

The ILSC planning and content review meetings, which began in 2013 and were concluded in 2014, took place at both SLU and MAK. Part of the planning was online through e-mail exchanges of documentation and online chats. However, due to the low bandwidth at Maklib it was not possible to hold virtual meetings via Skype, etcetera and we therefore had to limit our communications to e-mail exchanges and a few face-face meetings at SLU and Maklib.

It would be preferable to have more time together to plan the segment. This would give us an opportunity to get to know each other and map our different competences and expectations of each other better, which we believe would benefit the course as a whole.

Facilitators learned that they belonged to one team and no longer the Maklib team or SLU team. This encouraged the sharing of tasks. However, the cooperation between facilitators from both universities could be improved. A presentation does not necessarily have to be made by just one person and the interactivity between the two parties could be more responsive and reflective to show differences as well as similarities in a global perspective. More direct collaboration in the classroom would have been preferable to

overlapping teamwork. A suggestion is to create more frequent (online, e.g. via Skype or Google Hangout) contact between SLU and Mak teachers in the joint preparation of their lectures.

Teaching and learning considerations

“The joint planning and execution enabled the different views to be practised together and resulted in a professional discussion and analysis of the pros and cons of the different views.”

From the lessons learned from the occasion in June as well as the participants’ desire for more hands-on practice, the second ILSC programme mainly reflected more hands-on instruction with less theoretical instruction. The ILSC team therefore adopted the flipped classroom (learner-centred) style by embedding more discussion and hands-on sessions in response. It was also emphasized the fact that all the facilitators had to be fully involved to support the lead facilitators.

We learned to reflect on the segment as an ongoing professional development for both facilitators/teachers and participants. For example, the teams at Maklib and SLU in part operate according to different views as regards how to teach and evaluate, and understanding of the role of learning outcomes in the participants’ learning process. The joint planning and execution enabled the different views to be practised together and resulted in a professional discussion and analysis of the pros and cons of the different views.

During the last 15 minutes of each day, each participant filled in an online evaluation and assessment. They reported that their expectations of the course had been met and the following sessions were mostly mentioned to have imparted new skills and knowledge:

- reference management, specifically by means of Endnote
- professional citing and reference styles
- presentation of research work and how to make a poster
- search strategies and searching online databases.

Participants were particularly appreciative of the spirit of cooperation exhibited among the facilitators from both Maklib and SLU. The international composition of facilitators provided synergies and a blended teaching approach/style, which promoted learning. Similarly, the international composition of both participants and

facilitators provided a global view of the concepts taught and discussed during the segment and hence made participants and facilitators reflect on the implications of globalisation for their professional work.

The multi-disciplinary composition of participants’ backgrounds provided various interdisciplinary viewpoints that enriched the participants’ contributions to the delivery and enabled the facilitators to give examples and illustrations in the context of the participants’ research topics. Participants also said that the unity among them encouraged learning from each other, hence making use of the intercultural composition among them to leverage intercultural learning.

The examination was based on oral presentations and written assignments.

Areas of improvement/next steps

The schedule could be adjusted to improve the doctoral students’ self-reflection, e.g. instead of having a full day of lectures on one specific reference style and an instructional film put up on the student web showing how and why to use that particular style. Students can then be told to watch the film in preparation for their class. In-class contact time with the doctoral students can then be used for hands-on exercises, where the lecturers function as a resource.

The use of the computer room could be limited to sessions with hands-on activities and other lectures should be given in a room with possibilities to rearrange the furniture in a flexible way. Interactive learning (i.e. discussions, group work) requires that all participants and lecturers are able to see and hear each other.

Conclusive remarks

Facilitators from the libraries at MAK and SLU together with participants in various disciplines from different universities created a global context that was experienced as valuable.

The complexity of the content is also what makes it important. We were given components to understand the conditions at other teaching institutions, including learning, facilities and tools. We were also given components to sharpen our own cultural self-awareness and our ability to adapt cross-cultural coherence and understand the value of this diversity.

Possible future impact on educational development

Participants were able to make observations of the education, which hopefully can influence information literacy programmes at their home institutions. Maklib and SLU library have gained further international recognition for contributing to development of the knowledge and information competency skills of researchers in Africa. Additional experience has been gained by Maklib and SLU librarians in instructional skills, which will help implement the information literacy programmes at both universities more innovatively than before.

Names of the staff members who facilitated the course

Maria Musoke, Agnes Namaganda, Caroline Kobusingye, Andrew Mwesigwa, Liz State, Jane Frances Alowo, Merit Kabugo, Britt Marie Bergquist, Moa Hedbrant, Charlotte Håkansson, Nicolette Karst, Camilla Söderquist and Linda Åström Wennbom □

Open access and scholarly communication: local and global perspectives – a workshop for senior staff

Project leaders: Andrew Mwesigwa and Maria Musoke



Photo: Mosa Hedbrant

Classroom situation during the workshop at the Makerere University Library, Andrew Mwesigwa in front.

Introduction

Open access (OA) means unrestricted online access to peer-reviewed scholarly research. OA is primarily intended for scholarly journal articles.

Both Makerere University library (Maklib) and SLU library have been engaged in OA initiatives. Maklib has made deliberate efforts to sensitise researchers to the implications of OA in various fora. For example, in May 2013 Maklib librarians presented papers at the first OA international conference to be held in Uganda, organized by the Consortium of Uganda University Libraries (CUUL). CUUL is the brainchild of Maklib and librarians at MAK hold key offices in CUUL, including the e-resources national coordinator and general secretary.

The ILSC team developed a separate workshop for senior academics, research policy makers and librarians with a focus on strategic publishing, OA and institutional repositories, which form

part of the ILSC modules. The workshop theme was “Open access and scholarly communication: global and local perspectives” and the Maklib team conducted a two-day workshop twice in 2014, i.e. in June and September/October. The SLU team became short of human resources in early 2014 and could not participate in the actual workshops.

Working methods

Planning for the OA workshop was initiated at the joint meeting between SLU librarians and the MAK librarians in September 2013. In preparation for the workshop, various e-mails were exchanged between Maklib and SLU library. Librarians at Maklib also held several internal planning meetings.

Several calls for the OA workshop were made on SLU' and MAK's websites and were also sent out via the MAK academic staff list and the

CUUL. At the June workshop, Maklib received an overwhelming number of applications and therefore made a selection of candidates based on academic status criteria. Priority was given to senior academics at MAK from both agricultural and humanities disciplines as well as a few librarians. The selected participants from both the first and the second call were sent invitations. Of the 35 participants invited, only 18 actually attended the workshop. At the October workshop, on the other hand, all applications were made via the SLU website. 33 participants attended the October workshop. The team of workshop facilitators comprised the following categories:

- MAK librarians,
 - senior researchers and fellows of the Uganda National Academy of Sciences, other partnering institutions in Uganda, the editor of a local journal and the editor-in-chief of the African Crop Science Journal, which is an OA journal whose editorial secretariat is based at MAK,
 - senior academics who had coordinated OA projects;
 - lawyers and an academic with special interest in intellectual property and laws related to publishing and who had participated in the registration of the Creative Commons Organisation in Uganda.
- The second workshop was organized in October, purposely to mark international open access week. This gave the workshop a meaningful context.

Workshop content

The workshop focused on the following themes:

- Oa and the researcher, the library and the publisher
- OA publishing (green and gold routes)
- institutional repositories (IRs) and IR policies
- scholarly communication in the sciences: global and local perspectives
- OA and the laws related to publishing
- applying creative commons licensing for works published using the OA green route
- scholarly communication in the sciences
- promoting institutional publishing/journals
- anti-plagiarism initiatives

- an introduction to bibliometrics use of the InCities™ research management tool
- e-resources search strategy
- searching OA resources

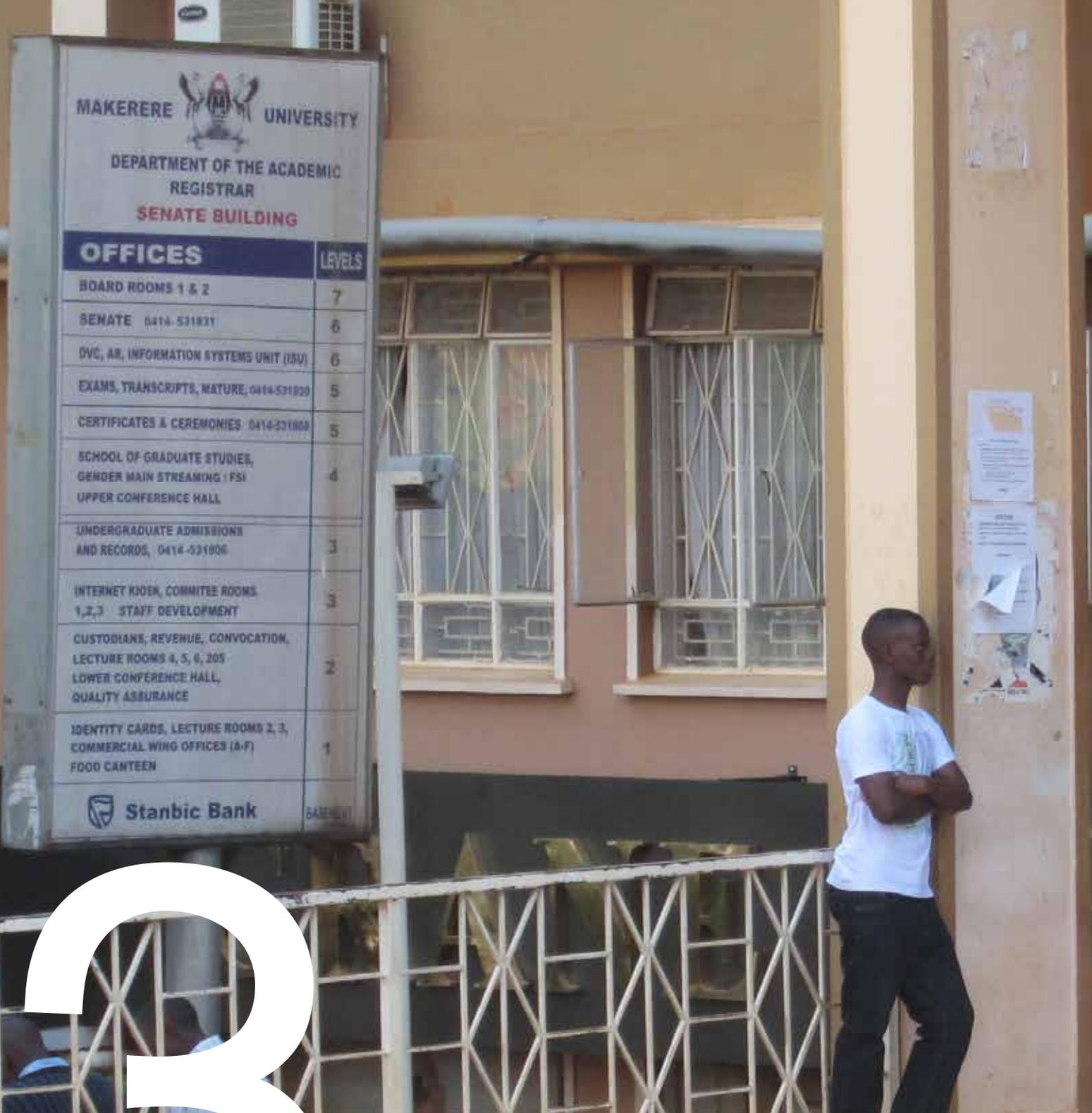
Teaching and learning considerations

The workshop included presentations, open discussions, thematic group discussions, and hands-on exercises. The discussions among the participants were enriched by the fact that they were from different disciplinary backgrounds and hence had different points of view. The synergy between librarians and researchers also benefited the workshop.

As a way to ensure that participants had understood the implications of OA for their roles and responsibilities, they outlined a strategy for their commitment and pro-active response to the use of OA. ■

“The discussions among the participants were enriched by the fact that they were from different disciplinary backgrounds and hence had different points of view.”





MAKERERE UNIVERSITY
DEPARTMENT OF THE ACADEMIC REGISTRAR
SENATE BUILDING

OFFICES	LEVELS
BOARD ROOMS 1 & 2	7
SENATE 0414-531831	6
DVC, AR, INFORMATION SYSTEMS UNIT (ISU)	6
EXAMS, TRANSCRIPTS, MATURE, 0414-531820	5
CERTIFICATES & CEREMONIES 0414-531808	5
SCHOOL OF GRADUATE STUDIES, GENDER MAIN STREAMING (PSI) UPPER CONFERENCE HALL	4
UNDERGRADUATE ADMISSIONS AND RECORDS, 0414-531806	3
INTERNET KIOSK, COMMITTEE ROOMS 1,2,3 STAFF DEVELOPMENT	3
CUSTODIANS; REVENUE, CONVOCATION, LECTURE ROOMS 4, 5, 6, 205 LOWER CONFERENCE HALL, QUALITY ASSURANCE	2
IDENTITY CARDS, LECTURE ROOMS 2, 3, COMMERCIAL WING OFFICES (A-F) FOOD CANTEEN	1

Stanbic Bank BASEMENT



Agri-food sector in rapid change requires reforms of institutional management, governance and leadership of higher agri-education

Introduction

Aissetou Dramé Yayé

Executive Secretary

African Network for Agriculture, Agroforestry
and Natural Resources Education (ANAFE)

Lena Andersson-Eklund

Deputy Vice-Chancellor

SLU

The major problems of tertiary agricultural education (TAE), i.e. education at bachelor, master and doctoral level, in subjects related to and important to agricultural development, in Africa include institutional isolation, inadequate teaching and research capacity, outdated curricula, inadequate private sector involvement, lack of contextualized learning materials and limited impact of graduates in the job market. This explains the inadequacy of jobs/employment faced by many graduates from African universities and colleges.

However, Africa severely lacks capacity and tools for designing strategic plans that would help develop and implement programmes of excellence in tertiary education institutions. Different platforms, networks and cooperation are thus operating in parallel in order to support educational development. For example, pan-African networks like ANAFE move regionally to build south-south collaboration but they also engage in projects initiated in collaboration with northern institutions.

The ANAFE *Strengthening Africa's Strategic Agricultural Capacity for Impact on Development* (SASACID) programme is aimed at building on assessment of institutional status, particularly in the areas of pedagogy, leadership and management, to carry out appropriate reforms. The SASACID programme has shown that delivery of results is not necessarily following the perception that established institutions with robust systems will equally deliver high impact results. This is largely because even strong African institutions lack capacity, tools and means for sound and effective institutional management.

University leadership needs to stimulate high standards in research and education. Quality research is characterized by:

- standing the test of being scrutinized;
- having substantial impact on the development of the research field;
- making a useful contribution to society in the short and long term.

Quality education on the other hand, is characterized by being:

- based on evidence of good practice;
- integrated carefully in the local context of the subject culture and practices that exist in a particular environment;
- interactive;
- broadly defined but with an individually defined focus.

Key ways of stimulating this quality include;

- gaining institutional perspective through evaluating past performance;
- using collected data to assess how past performance meets strategy;
- paying due attention to the inner life of departments/research groups;
- nurturing successful departments/groups and provide them with as much autonomy as possible;
- ensuring long-term funding of promising research and good education;
- intervening promptly in departments/research groups that are dysfunctional with regard to processes and/or outcomes;
- creating a good infrastructure with regard to technical and intellectual resources;
- ensuring effective administrative support.



When building capacity in higher education for all, the involvement of university top decision-makers and institutional leaders is the key – without their understanding and support the insights and skills conquered by university teachers, facilitators, lecturers, supervisors, doctoral students, pedagogic development officers, librarians, etc. with the help of capacity development programmes might not get implemented.

Participants in courses and workshops for training in higher education teaching, learning and supervision regularly state in concluding discussions the need of support from the university leadership. They also request sustainable educational support structures that can complement capacity development in the form of increased knowledge and skills by the human resources.

The capacity and reliability of IT-support systems is improving continuously and at an encouraging pace. Computers, tablets and smartphones are increasingly available tools for supporting educational development and management. The development of a web portal supporting doctoral students and their supervisors both when performing and developing the doctoral education was therefore begun during the programme.

The activities reported on in this chapter, all in different ways, addressed the need to identify good governance and management practices as well as good supervision practices and ways to implement them. Tools that support development of higher education were also developed and tested.



Regional training workshop on governance and management in Tertiary Agricultural Education (TAE)

Nelson Mandela Institute of Science and Technology, October 2014

Project leader: Aissetou Dramé Yayé



Participants in the Regional training workshop on governance and management in Tertiary Agricultural Education (TAE).

Summary

Following the self-assessment, carried out by the pilot institutions implementing the ANAFE SASACID programme, that indicated the important role leadership has in reforming tertiary agriculture and natural resource education, ANAFE organized in partnership with SLU a three-day training workshop on Governance at Nelson Mandela Institute of Science and Technology in October 2014. The workshop was to 1) Inform institutional leaders of the results of self-assessment; 2) Share knowledge and experiences on lessons learnt and best practices on institutional governance; 3) Develop approaches for improving institutional governance and management and in particular addressing issues raised by institutional self-assessment.

Thirty-five people including Francophone and Anglophone vice-chancellors/presidents of universities, college prin-

cipals, deans of faculties and senior lecturers were among the participants. SLU was represented by the Deputy Vice-Chancellor and the Director of the Division of Educational Affairs. The delivery methodology combined plenary sessions that focused on theory and principles of governance and management, with discussions in small groups, a case study and panel presentations.

The main outputs included 1) Consensus on the challenges facing TAE institutions; 2) A compilation of experiences and lessons learned in handling challenges in institutional management; 3) An action plan and way forward.

Description

The African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE) organized a workshop that was held in Arusha, Tanzania, at the Nelson Mandela Institute of Science

Summary in Swedish

En självvärdering som utfördes av pilotinstitutionerna i ANAFE SASACID programmet visade på ledarskapets viktiga roll vid reformering av högskoleutbildning i jordbruksrelaterade ämnen. Därför organiserade ANAFE och SLU i oktober 2014 en workshop om styrning av högskolor och universitet. Workshopen syftade till att 1) Informera högskole- och universitetsledare om resultaten av självvärderingen; 2) Dela erfarenheter och bästa praxis om styrning av högskolor och universitet; 3) Utveckla metoder för att förbättra styrning av universitet och högskolor och då särskilt behandla frågor som självvärderingen pekat ut.

En grupp (35 st) med både fransktalande och engelskspråkiga rektorer och universitetspresidenter, prefekter, dekaner för fakulteter och lektorer deltog i workshopen. SLU representerades av prorektor och chefen för utbildningsavdelningen. Under workshopen kombinerades olika mötestekniker som exempelvis plenarsammanträden fokuserade på teori och principer för styrning och ledning, små gruppdiskussioner, fallstudier respektive panelpresentationer.

De viktigaste resultaten blev 1) Konsensus angående kommande utmaningar för universitet och högskolor med utbildningar relaterade den till agrara sektorn; 2) En sammanställning av erfarenheter och lärdomar för hur hantera utmaningar i vid styrning av universitet och högskolor; 3) En handlingsplan med idéer om vägen framåt

Facts

The African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE) is a network of 136 universities and colleges in 36 African countries. ANAFE's 2015-2019 strategy identifies its vision as: An effective agroforestry and natural resources management education and research in Africa, with measurable impact on livelihoods and environmental sustainability. This strategic approach calls for work on three fronts to simultaneously improve (1) learning at higher education institutions, (2) the context and links of learning institutions with rural and enterprise development objectives, and (3) the relevance of TAE through applied research and development to benefit small-holder farming households in rural areas.

ANAFE implements its mission through four sub-regional chapters named RAFTs (Regional Agricultural Forums for Training), each governed by six senior educators elected by member institutions in the region. The RAFTs coordinate the activities at the regional level and work with national training, research and development institutions, which form national chapters of ANAFE named NAFTs.

and Technology from 1- 3 October 2014. Under the theme *Developing approaches for improving institutional governance and management*, the participants used the recommendations from the *Strengthening Africa's Strategic Agricultural Capacity for Impact on Development (SASACID)* institutional self-assessment in order to define the way forward.

From the sixteen SASACID Pilot Institutions, seven Francophone and four Anglophone institutions carried out their institutional self-assessment (ANAFE, Institutional self assessment reports, 2014). Assessment criteria from both the councils for Francophone Africa and East Africa were used. The weaknesses identified included lack of well-developed Standard Operating Procedures, weak communication channels, too high a percentage of young/inexperienced lecturers compared to experienced professors, weak teaching and research infrastructure (lecture rooms, library, ICT), insufficient knowledge of university regulatory texts on the part of lecturers, weak publication skills (Francophone institutions), and weak involvement of private sector in curriculum development.

The workshop had three key objectives and expected outputs:

Objectives

- Inform institutional leaders of the results of the SASACID self-assessment.
- Share knowledge and experiences of lessons learned and best practices in institutional governance.
- Develop approaches for improving institutional governance and management and in particular address issues raised by the institutional governance self-assessment.

Expected outputs

- Consensus by institutional leaders on the challenges facing the institutions as contained in the self-assessment report and from their own experience.
- A compilation of experiences and lessons learned of handling challenges in institutional management.
- Action plan for implementation of recommendations from institutional self-assessment reports.
- Thirty-five participants were drawn from tertiary agricultural education institutions from across Africa.

The delivery methodology combined plenary sessions that focused on theory of governance and principles of governance and management on the one hand, with discussions in small groups and case study presentations by panels on the other.

Results

During the discussions in small groups, suggestions were presented on how to seize leadership and governance opportunities in building an organizational culture. The suggestions can be grouped into three areas:

1. Building a new organizational culture that finds solutions from within

- Promote openness in the appointment of leaders and give these individuals scope to positively influence the culture of the institution.
- Promote a culture of transparency and accountability with a smooth flow of information sharing both bottom-up and top-down, including such facilities as suggestion boxes.
- Develop a strategic plan in a participatory manner that brings all stakeholders on board.
- Create a learning mindset that is open to criti-



Campus tour.

cism and suggestions and that promotes participatory management through honouring local solutions and conducting continuous sensitization of staff and students.

- Create a culture of performance that rewards and reprimands based on agreed standards. Build capacity and ensure that all the staff at the institution understand its rules and regulations.
- Build strong team synergies and promote a mutual working relationship between academic and administrative staff, e.g. provide career opportunities for administrative staff.
- Continuous training of CEOs and senior management in leadership and management.
- Build robust human resource (HR) systems that hire and retain qualified, motivated personnel through continuous training, synergy development and proper recognition and incentives.
- Have internal systems and mechanisms for measuring performance and enhancing communication and feedback.
- Creating think tanks and ad hoc teams that reflect on different aspects and build solutions to challenges that face the institution.

2. Involving stakeholders as management to play their role in enabling universities/colleges to perform.

- Management should involve all stakeholders, including students, lecturers, administrative and technical staff, government and partners (private

sector, NGOs, etc.), with appropriate platforms such as MOUs in a win-win mindset.

- Hold frequent consultative meetings that involve all stakeholders (students, student bodies, lecturers, private sector) face to face or via web platforms.
- Involve stakeholders in training and research. (Participatory research planning, internships, curriculum development, giving lectures.)
- Create an institution database of expertise and make it open to the public.
- Involve stakeholders in planning and review of research, training, and infrastructure development.
- Hold annual awards meetings.
- Share information using the website.
- Transparency in the strategic plan. (Each university should be engaged in self-assessment that includes a SWOT analysis followed by an elaboration of the strategic plan).
- Devise a strategy to address each group.
- Good communication with different stakeholders.
- Secure representation of all staff in different aspects of teaching, council, etc.
- Follow up alumni.
- Marketing strategy.
- Communication: publishing of annual report, social responsibility in the community.
- Set targets for each stakeholder: appraisal of performance (so that it can be assessed and

Facts

changes be made).

- Involve staff and students in decision-making.
- Encourage vibrant student unions.
- Involve parents/community in university activities, e.g. open days.
- Involve stakeholders in curriculum development and review.

3. Build self-sustaining universities and colleges

- Ensure high quality of education that will attract students through retooling of lecturers and regular curriculum reviews. Carry out necessary assessment before mounting new curriculum and regular review while involving stakeholders. Continuous partnership with SLU on this.
- University should be able to diversify and strengthen its sources of income through mobilizing financial resources alongside government support.
- Create income-generating businesses and activities, including consultancies, research projects, incubation centres, farms, hotels, hospitals and offering short courses. The example of Kenyatta University in Kenya.
- Pursue public-private partnerships in providing relevant infrastructure for education and research, including laboratories, classrooms and equipment. The example of the Nelson Mandela Agricultural Institute of Science and Technology.
- Attract and maintain highly competent staff through incentives (health insurance, low mortgage) and use them efficiently.
- Develop an exciting and motivated high-quality faculty through having staff retention strategies and approaches as on-going development and a single-spine salary scheme, e.g. salaries tagged on qualifications.
- Strengthen financial management systems that enhance efficiency, compliance, transparency and accountability.
- Vice-chancellors and other university leaders should form a network that influences education and other relevant policies within the country and the region.

Recommendations for way forward

The next steps that the meeting will need to take in order to support institutions in the implementation of workshop outcomes are:

1. Establish robust quality assurance programmes,

The Strengthening Africa's Strategic Agricultural Capacity for Impact on Development (SASACID) programme is a transformative initiative developed by the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE) to improve the quality, relevance and application of tertiary agricultural education in sub-Saharan Africa.

Mobilizing regional capacity for enhanced delivery of tertiary agricultural education is ANAFE's primary focus with the SASACID programme. SASACID was developed with the overall goal of transforming "agricultural education programmes in sub-Saharan Africa so that they are in agreement with African priorities within a framework that will produce an adequate number of quality graduates working in the agriculture sector."¹

From 2012 to 2014, the SASACID programme focused on agricultural leaning and development objectives, developing contextual learning materials, management of risk and uncertainty curriculum development, retooling lecturers in pedagogy and institutional leaders in governance, and strategizing on how best to work more closely with the private sector.

Footnote 1) Strengthening Africa's Strategic Agricultural Capacity for Impact on Development (ANAFE/SASACID) Results-Based Management Umbrella Logical Framework: 2012-2014 (5th February 2013), p. 1.

including:

- Develop simple, integrated and relevant tools for measurement and conducting internal and peer review assessments of governance and management
- Establish regional and global benchmarks
- Support institutions in setting up directorates and structures at institution level

2. Continuous education programmes that expose institutional leadership to best practice and trends in governance and management functions, including:

- Follow-up meeting that builds on what has been covered during this workshop and that brings other leaders and institutions on board. Three days are ample time for training and building and strengthening contributions of panels and small group processing.
- Help develop what could be considered to be a

comprehensive governance and management tool for those in leadership

- Initiate a peer-to-peer mentoring programme among university leaders

3. Build institutional sustainability by engaging strategic stakeholders and networks in order to create diversified funding models:

- Host stakeholder conferences and symposia aimed at multiplying opportunities for enhancing institutional relevance and impact.
- Establish a network of vice-chancellors and other university leaders who influence education and other relevant policies at national, regional and global levels.

4. Facilitate collaboration between regional university organizations, viz. IUCEA, CAMES, AAU and AAS so as to coordinate strategies and actions to strengthen leadership and governance.

Participants felt that ANAFE should hold such training workshops on a regular basis and should hold a follow-up meeting soon which would bring more people on board, in particular the vice-chancellors and other decision-makers. The participants also recommended that ANAFE should share with them the good governance and management practices that were identified during the workshop. This would allow each one to compare the practices with their own and see how to improve the way they do business.

Conclusion

The follow-up phase programme to SASACID will also play an important part in strengthening institutional capacity for governance and leadership, which is another common link that could strengthen the collaboration between SLU and ANAFE. ■

Improving Tertiary Agricultural Education (TAE) leadership in Africa

A training tool for African academic leaders to bring relevant issues into their programmes

Project leaders: Sebastian Hess, SLU and Luis Mira da Silva, University of Lisboa, Portugal

Summary

Based on the Delphi method, two leadership training workshops were conducted during 2014, each with around 30 African academic leaders.

The workshops constituted a pilot project aimed at developing the applicability of a tool for academic capacity development in Africa on a large scale. The tool, an extensive questionnaire about current status and the future of tertiary agricultural education (TAE) in Africa, was developed in the previous SLU Global project *Prospective study about the future of TAE in Africa*.

Participants in both workshops emphasized that they were in principle aware of the fundamental problems of TAE in Africa and a practical tool for development and support of definite action was requested.

Workshop results indicate that the tool is useful for structured discussions among young African academic leaders aimed at designing strategic plans for TAE based on definitions of the characteristics of an 'ideal graduate', or a practical strategy to build a TAE programme of international excellence.

Despite many close contacts with stakeholders at African institutions, the process of scheduling the workshops took much longer and was more complicated than initially planned.

Introduction

The global agri-food sector is in need of a larger and better educated agricultural workforce. Attracting, training and retaining such a workforce will be crucial to the competitiveness of all major agricultural-based economies. The existing literature suggests that African countries can help themselves to i) overcome the many factors that are currently slowing down agricultural productivity growth in rural areas, and ii) catch up with the dynamics of

emerging regional and global food and agribusiness value chains by reforming Tertiary Agricultural Education (TAE). This reform represents a major challenge for universities and agricultural colleges.

Two leadership training workshops, each lasting two days, were held in collaboration with local and supra-national African institutions in Tanzania and Mozambique, respectively. In all, 69 young African academic leaders from about twenty different African countries and several pan-African organizations and networks participated.

Objectives and intended outcomes

The aim was to develop the applicability of a tool for academic capacity development in Africa on a large scale by using the tool in workshops where leaders from African universities reflect in-depth about the situation regarding TAE in their institutions.

During the workshops, the participants

- gained new insights, exchanged relevant ideas and experiences and discussed practical solutions at their institution with respect to (1) policy and governance management, (2) teaching methods, and (3) resource mobilization to improve the performance of TAE systems in Africa in general and in the region where a corresponding workshop was held in particular;
- validated critical issues of best practices and lessons learned from previous TAE reforms in Africa and outlined a way forward for specific strategies at individual university and country levels;
- formed networks that may be a continued source of exchange and inspiration regarding academic management problems at the corresponding faculties, so that the workshops will also contribute to strengthening African

Summary in Swedish

Två workshops baserade på den så kallade Delphi-metoden, var och en med cirka 30 afrikanska akademiska ledare, genomfördes under 2014.

Workshoparna var ett pilotprojekt som syftade till att utveckla tillämpningen av ett verktyg för akademisk kapacitetsutveckling i Afrika i större skala. Verktöget, en omfattande enkät om dagsläget och framtiden för högre lantbruksutbildning (TAE) i Afrika har utvecklats i ett tidigare projekt vid SLU Global: *En systematisk utredande studie om framtiden för TAE i Afrika*.

Deltagarna i båda workshoparna betonade att de i princip kände till de grundläggande problemen med TAE i Afrika och de uttryckte stort behov av ett praktiskt verktyg som stöd för utveckling av adekvata åtgärder.

Resultaten från workshoparna tyder på att unga afrikanska akademiska ledare finner verktöget användbart för strukturerade diskussioner som syftar till att utforma strategiska planer för TAE. De strategiska planerna kan antingen basera sig på definitioner för egenskaperna hos en "idealisk student", eller på en praktisk strategi för att bygga ett TAE program för internationell excellens.

Trots många nära kontakter med intressenter vid afrikanska institutioner visade det sig att arbetet med att organisera seminarierna vara en mycket längre och mer komplicerad process än vad som ursprungligen förutsågs.

agricultural universities in the long-term.

Project description and content

During the workshops the Delphi method in combination with a planning framework for strategic management (Business Model Canvas www.businessmodelgeneration.com/canvas), was used to analyse perceived challenges and opportunities for the future within the group of participants. This method supports development of consensus on strategies to solve complex problems. After an initial survey, the participants were confronted with the average responses from the group in comparison to their own estimates. Individual deviations from the group average were then discussed with respect to either the need to revise an individual answer or specific reasons for a deviating answer to take place. A trans-disciplinary expert consensus on complex issues was subsequently achieved in parallel with identification of special cases and circumstances under which the average group views may not apply and individual approaches might instead be required.

A previous SLU Global project had conducted a prospective study on the future of TAE, identifying and analysing the expected changes in the agri-food sector and their impacts on the development of African TAE. Based on a systematic review of existing evidence and qualitative interviews with stakeholders in Africa, a questionnaire was developed. The questionnaire assesses the specific institutional situation at an African university in connection with the regional labour market for agricultural graduates. Data collection using the questionnaire has been ongoing in many Anglophone, Francophone and Lusophone African countries. Elements of the questionnaire were used as a tool for self-reflection, analysis and group discussion in the two leadership training workshops.

The workshops were conducted by a team of three Tanzanian and two Mozambican facilitators with moderators assigned to handle discussion sessions. Each workshop included individual presentations, group exercises, group discussions, group presentations and plenary discussions. Individual presentations included NEPAD officials,

members of the steering committee of the Prospective Study, and in the case of the Tanzania workshop also one each from FARA, AESIF and USAID

Group discussions and exercises emanated from the presentations and focused on deeper examination of the presented materials with a view to crystallizing issues and moving towards group consensus. Group discussions were for example held on issues such as demand and supply of human capital in agriculture, the characteristics of an ideal graduate, new pathway to transform the future of TAE in the workshop region and a strategic plan to create a leading TAE institution in the workshop region.

After in-group discussion, each group gave a presentation at the plenary session where discussions aimed at reaching a shared vision of issues, modalities and conclusions among the participants with regard to the presentations.

Results

Based on presentations, group exercises and discussions, the workshop participants have drawn the following conclusions and selected the following recommendations:

- **Governance**
 - Need to formulate national action plans through a participatory approach by all actors during a 'national forum' with the objective to (1) build a national TAE team and attain consensus at country level on the TAE institutional reform processes needed to meet the CAADP objectives expressed in the countries' NAIPs, and (2) draw up clear strategic and investment plans for TAE improvement as stated in the regional workshop report. The main process should be through a wider consultative process and brainstorming at national level to attain the commitment of all stakeholders.
 - Build a regional coordination structure in collaboration with ASERECA, COMESA and SADC to foster a regional synergy of action in collaboration with NPCA/AET.
- **Curricula reforms and new teaching methods**
 - A comprehensive prospective study on the needs of the future job market has to be carried out and

updated as the current curriculum no longer fits the needs of the agricultural labour markets and end-users.

- Align curricula, methods and training modalities so that they channel out reform efforts aligned to the purpose for which the reform was conceived.
- Promote training on real life examples with well-equipped experimental and research stations with project incubators and training through the competency-based approach. Inclusion of professional training, joint degrees, mobility of teachers and students, and affirmative action to attract young people to make careers in the field of agriculture.

- **Financial support**

- Increase public funding through long-term investment plans.
- An urgent ten-year strategic investment plan for TAE and a business model need to be established in order for TAE to generate its own revenue for self-sustainability.
- Partnerships are a way of bringing about sustainable changes, including reforms. Partnerships make it possible to bring many actors with different roles and capacities together to achieve common results. In this regard international, governmental, public and private actors are all important.

During the discussions, the participants realized that the current situation on the continent shows that in some cases curricula tend to focus more on specialization while in others they focus more on generalization. Conclusions from the discussion recognized and accepted the two forms of curricula. However, the conclusions insisted that graduates should have a broad-based foundation in agriculture along with soft skills and the right attitude to solve practical problems. Specifically, in addition to technical knowledge in agriculture, graduates should have the following skills and/or qualities: soft skills, entrepreneurial skills, effective communication skills, and hands-on practical skills in agriculture, and should be innovative and problem solving with a value-chain orientation.

During each workshop, detailed responses to the prospective study questionnaire were collected. These data provided insights into the opinions of relevant stakeholders in different regions and different institutional environments in Africa and will be analysed and presented in a scientific publication.

Evaluations and lessons learned

Organization of the workshops was challenging, and despite our excellent connections with high-level representatives of TAE African institutions, including the valuable support and cooperation of TEAM Africa, it was difficult to find local partners willing to commit to hosting the workshops. Scheduled workshops had to be rescheduled several times. However, when we began to attach the workshop to another meeting of a similar target group it was much easier to schedule and find participants willing to register.

The difficulties in setting up the workshops are the reason why not all planned workshops could be implemented during 2014, despite the fact that both workshops conducted turned out successfully (as perceived by us).

In to our view, it has become evident while trying to organize the workshops that the institutional landscape of TAE in Africa makes it difficult to operate based on general top-down approaches. Instead, it would seem necessary to plan and conduct activities with a regional focus combined with high-level institutional support, but at the same time also have excellent contacts to highly committed local partners. There are two main reasons for this. The first is the lack of availability/time on the part of senior staff at the higher education institutions. These institutions are usually highly hierarchized and those holding top positions tend to be involved in too many activities. The second is the institutions' complete autonomy (and sometimes lack of monitoring/control). To organize something like these workshops it is therefore necessary to have high-level support but also the commitment of local partners/institutions, otherwise nothing works.

Participants evaluated the workshop in Tanzania as very good overall across 13 items evaluated that covered all topics on the agenda, logistical support, facilitation and the venue. The average score on all the items was 3.8 out of 5, which falls between good (3.0) and very good (4.0). The lowest average score was 3.2 and was related to accommodation aspects.

In Mozambique, there was no formal evaluation of the workshop because the event was integrated in a larger initiative. The feedback from participants was nevertheless very positive. Several participants (three institutions from Mozambique and two from Angola) requested more extensive support of their institutional strategies. It was agreed that further work would be undertaken on the

future of TAE and potential sources of financing to develop initiatives in collaboration be sought at national/institutional level.

Concluding remarks

The workshops brought together a diverse group of TAE stakeholders from relevant eastern and southern Africa, in particular decision-makers in TAE, including institution leaders, government officials from agriculture, science, technology and education, private sector/agri-business representatives, CAADP national representatives, regional organizations, tertiary education networks, research institutions, extension services, development partners and student representatives.

“The responses from the workshop participants have generated a rich data set about the situation of TAE in the African institutions represented through the participants.”

We conclude that leadership training workshops are an effective way to strengthen urgently needed regional and international networking among African TAE institutions, and to quickly spread not only new ideas but also practical approaches to implementing ideas for change at the participant’s home institutions. It is obvious that these workshops are particularly useful in countries where official channels to disseminate such information, or implement changes, work less effectively.

In other words: given that other means of TAE governance currently do not overall signal a substantially high degree of effectiveness in facilitating institutional learning and institutional change, the overall very positive experiences from the two pilot workshops suggest that they should in the short and medium term be used and developed further.

After a successful pilot implementation, a further series of similar workshops is envisaged and will lead to the establishment of a unique training tool for academic capacity building in Africa. In addition, the responses from the workshop participants have generated a rich data set about the situation of TAE in the African institutions represented through the participants. Due to the general unavailability of such data and corresponding analyses it is very likely that scientific publication based on the results from the workshops will also be possible. ■

Training doctoral supervisors – a cornerstone of quality doctoral education

Project leader: Natalie Jellinek



Photo: Anne Lee

Workshop participants.

Summary in Swedish

I syfte att långsiktigt främja kompetensutveckling hos forskarhandledare på både SLU och dess partneruniversitet utvecklar SLU en webbportal med stöd som kan stödja både deras praktik och utveckling av pedagogisk kompetens. Portalen bygger på SLU:s omfattande erfarenhet inom detta område, handledarworkshops på Makerere University, inklusive informationen som hämtats från enkäter och videointervjuer med både handledare och doktorander. Portalen kommer att vara till nytta i det långsiktiga arbetet för att förbättra kvaliteten på forskarutbildningen och dess internationalisering..

Summary

To enhance the development of long-term supervisory skills at both SLU and its African partner universities, SLU is currently developing a web portal focused on effective supervision practice. The portal draws on SLU's extensive experience in this area, input gained during supervision workshops at Makerere University, including the delivery of surveys, and video interviews of both supervisors and doctoral students. The portal will be useful in long-term efforts to improve the quality of research education and the internationalisation of doctoral education.

Introduction

Over the past twenty years, SLU has given mandatory courses for doctoral supervisors, making it one of the first universities in the country to invest in pedagogical support for research supervisors. During the past five years, SLU has recruited an increasing number of international researchers who are in need of this training; the courses are therefore currently given in both Swedish and English.

The aim of the training programme is to prepare inexperienced doctoral supervisors to serve as principal supervisors by training them in professional communication, conflict management,

research ethics, but also by incorporating a reflection about one's own supervisory role, including strategies to guide individual and group processes.

At the same time, SLU has become increasingly involved in international collaborative projects over the past few years, participating in the development of training and capacity development initiatives in countries such as Ivory Coast, Kenya, Uganda and Rwanda. One of the main needs consistently emerging from these efforts is linked to investment in supervisory training and the development of relevant contextual materials. Participants recommended that networks for doctoral supervisors be created and regional benchmarking initiatives developed. These recommendations, combined with SLU's extensive experience of offering courses related to research supervision, inspired the higher education and learning team to initiate an activity that was not part of the original programme. The intention of this additional activity was to develop a durable tool to support both current and future research supervisors, i.e. a *web portal* focused on doctoral supervision.

Apart from SLU's extensive experience of research supervision training, the web portal (Figure 1) includes results and learnings from:

- doctoral supervision workshops performed during the Innovative Doctoral Education for Global Food security programme;
- video interviews of supervisors' and doctoral students' own experiences;
- a survey study based on a questionnaire that was distributed to both PhD students and supervisors participating in the programme.

Workshops on doctoral supervision

SLU held two doctoral supervision workshops at Makerere University, Uganda. The workshops were held from 18-19 and 21-22 August 2014 and were facilitated by Dr Anne Lee, an independent consultant from the UK.

One goal was that after having participated in the workshops, the participants would have reflected upon their roles as supervisors in their historical and cultural contexts. An additional intended goal was to equip participants with the tools they need to be able to adopt a range of good practices in research supervision.

In addition, it was agreed that by the end of the sessions participants would be able to:

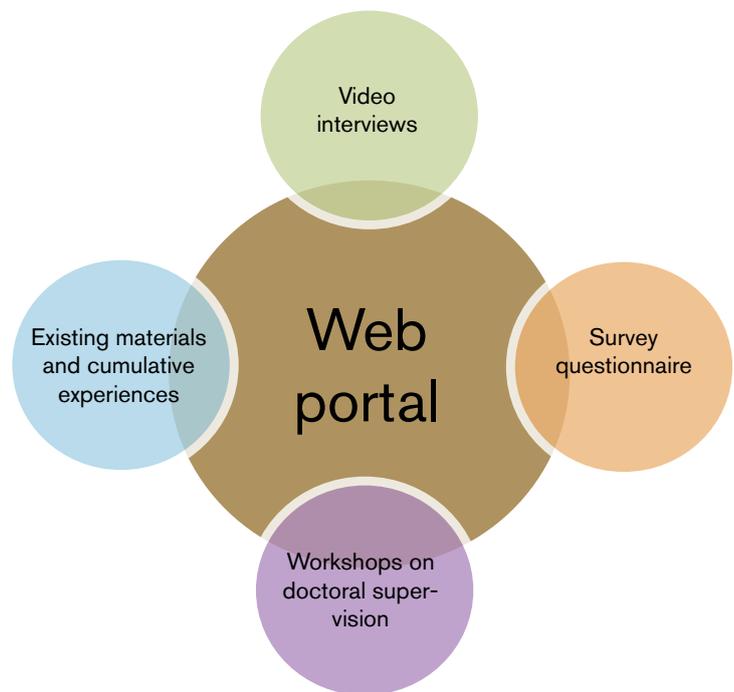


Figure 1. Doctoral supervision web portal inputs.

- Articulate learning outcomes for doctoral studies and differentiate them from learning outcomes at other levels of higher education
- Identify key challenges and benefits from collaboration between co-supervisors, disciplines, cultures and institutions
- Contribute to a final report containing recommendations for the future and evaluating the programme

The target group for the workshops was doctoral supervisors active in the area of global food security. Twenty doctoral supervisors participated in the first workshop and eighteen in the second. They represented universities in Kenya, Rwanda, Sweden, Tanzania, and Uganda.

Based on the feedback from the written evaluations, the workshops were extremely well received and participants gave significant input in various ways.

Future impact

- Increased quality in doctoral supervision
- Establishment of regional expertise/networks in the area of supervision development
- Contribution to the harmonisation of and regi- ▶

onal agreement upon standards and benchmarks. The participants were eager to continue to develop as supervisors and to coordinate doctoral practices and regulations across countries.

When developing future training programmes, consideration should be given to the following aspects of supervision:

- Managing ethical dilemmas
- Providing feedback on academic writing
- Supervising international students
- Management of conflicts of interest between supervisors
- Examining theses and recognizing the depth required for a PhD thesis.

Video interviews

In order to highlight and draw upon the supervisors' and doctoral students' own experiences, video interviews were conducted with selected participants from both SLU and partner universities, including several participants active within this project. The recordings captured questions about participants' challenges, such as their perceptions regarding supervision, supervision in an international context, and what advice they would give to a researcher in the same role. The material from the recordings will contribute to different modules on the web portal and will serve to both illustrate and clarify the international dimension of this tool.

Below follow some of the key ideas expressed by the respondents.

Regarding ethics and supervision:

"Ethical issues can be related to religion and cultural aspects ... and can be difficult to handle in some ways. [In the area of animals] the view on how to look upon animals, euthanasia of animals, or how to keep them and care for them. There can be things that we do not accept in Sweden but also things that people from other countries do not accept. We must try to find a balance when we plan a thesis study and discuss it with the student, describe the system and how we keep the animals: this is the way it is done in Sweden and how do you feel about that? Bring up this issue and discuss it and find a common way to handle it." (Female doctoral supervisor, Sweden)

Regarding cultural misunderstandings and supervisory roles:

"One of the things that happens when you bring people from far away to Sweden is a culture clash – they are used to a different relationship with the supervisor than we expect." (Male supervisor, Spain)

Regarding gender and its impact on supervision:

"My father finished his masters in Belgium and when he came back he said to the eight girls in my family (...) always our father in the evening around the dinner table said, don't follow those things that people say that girls are less important than boys. You are also able to be [in positions of power]; and that was put into our mind. All of the girls in my family got a degree from the university." (Female doctoral student, Democratic Republic of Congo).

"We were able not only to broaden the scope of the training, but also assess and identify participants' needs for future educational support."

The material based on supervisors' and doctoral students' own experiences will be developed so it:

- include of interviewees' diverse perspectives and traditions when addressing key themes related to doctoral supervision;
- share of promising practices with other interested parties;
- foster of active participation in training activities by including real-life examples.

Survey study

During the implementation of this project, SLU launched a survey focused on new doctoral supervisors and how they manage their first years in their new role. Some of the themes explored in the survey include participants' needs, how these develop over time, and desired areas of future training. The questionnaire was first conducted as a pilot in partnership with several Swedish universities.

While working with both new and experienced research supervisors at Makerere University, SLU seized the opportunity to also include their experiences in the study. In this way, we were able not only to broaden the scope of the training, but also assess and identify participants' needs for future educational support, which often might differ from those of their Swedish supervisor counterparts. With the help of the questionnaire, we were able to develop a clearer understanding of the participant's needs and concerns, thus

obtaining a good basis for designing and producing relevant material for the future web portal. The same questionnaire was distributed to both PhD students and supervisors participating in the workshops and courses at Makerere University in June and August 2014. Although no general conclusions can be drawn from such a survey, the results indicate that supervisors and their students sometimes have differing views and understandings regarding definitions of effective supervision and the amount of support they provide and receive, respectively.

Twenty-six supervisors and thirty-four doctoral students who participated in the workshops and courses at Makerere University answered the survey.

The participants' responses highlighted the following needs and possible future directions in the area of supervision:

- Policy work: Development of a clearer policy for research supervision so that quality can be improved.
- Resources: Additional support for research supervision and materials and books related to research supervision.
- Professional development: Participate in courses and be given support to create networks for doctoral supervisors at the department level.
- Personal development: Need for experienced mentors and support in the area of scientific methods in research.

Below follow some of the responses to the question of what they perceive to be their biggest challenge as supervisors:

"To shape a better network or group for supervisors at the university."

"Students who do not report on their research progress." (Male supervisor, Makerere)

"Having a co-supervisor not giving comments in time." (Male supervisor, Makerere)

"Non-responsiveness from one of the supervisors." (Female supervisor, Makerere)

Below follow some of the responses to the question of what support they want as supervisor:

"Financing to attend conferences and workshops like this." (Female supervisor, Makerere)

"More resources for supervisors and financial facilitation." (Male supervisor, Makerere)

"Ready materials and books on supervision." (Male supervisor, Makerere)

The survey tool could be used in the future to collect both supervisors' and doctoral students'



Photo: Lotta Hansson

ideas and approaches to supervision and to get a clearer picture of what kind of support new supervisors need. The survey tool provides a good basis for shaping the web portal and developing relevant material for an international audience

SLU now participates in a larger network of research supervision trainers from other universities (Oxford, Cambridge, Westminster, Bristol, Copenhagen and Oslo) who could use the survey to examine the needs of their own supervisors and doctoral students, potentially with a comparative feature.

Web portal

The different activities described above all contributed to, and served as inspiration for, ►

the creation of a web portal that would live on beyond the scope of the project, serving as a tool benefiting all current and future supervisors at the participating universities. This product, conceived in the hope of making the impact of this project even more sustainable, is designed with a clear international perspective that permeates the content and the activities within it, making it valuable both when training international supervisors at Swedish universities and during supervisory training at partner universities. Additional material and interactivity will gradually be added to the portal.

The web portal could be used by individual supervisors looking to deepen their skills in one particular area, by groups of supervisors wanting to discuss informally, and also as course material since it will include assignments for self-reflection. Trained and experienced supervisors could also use and build on these materials to participate in and even lead the training of younger and more inexperienced colleagues in a train-the-trainer fashion.

The web portal has ten thematic modules focused on doctoral supervisor training:

1. Starting out
2. Finding key policies, procedures and guidelines
3. Different approaches to supervision
4. Communicating effectively
5. Anticipating ethical issues
6. Creating a strong supervisor team
7. Supervising candidates at a distance
8. International supervisors and international candidates
9. Managing diversity
10. Getting the doctoral student ready for assessment

Each module has an introduction, a fact-based section, and ready-made materials to use in the course sessions, complete with homework assignments to work on.

The themes raise key questions that the successful supervisor needs to address, ranging from planning an effective recruitment strategy and managing expectations to planning for the assessment of the candidate. All of these themes emerged during discussions with the participants in the workshops and are reflected in both the interviews and in the survey. The internationalization perspective permeates the entire web portal.

Video recordings of supervisors and doctoral students are an essential part of illustrating and bringing to life actual experiences of the supervising process.

The portal, see <https://internt.slu.se/upc/en/successful-doctoral-supervision>, will be useful in long-term efforts to improve the quality of doctoral education and the internationalisation of doctoral education. ■

Educational management development – workshop for educational leaders

A collaboration with the University of Rwanda

Project leader: Natalie Jellinek and Mathias Ndizihiwe



Photo: Peter Aspengren

Participants in the workshop at the University of Rwanda, Kigali, Rwanda, 2014.

Summary

The workshop *Improving Teaching and Learning at the University*, geared towards senior lecturers from the University of Rwanda (UR), was held in Kigali in December 2014. Participants had extensive teaching experience and were active within the *UR-Sweden Programme for Research, Higher Education and Institutional Advancement*. Based on a train-the-trainer approach, participants were selected based on their future ability and willingness to spread information and train their colleagues. Participating heads of departments, deans and influential professors appeared ready to act as future agents of change. The workshop was facilitated by an SLU and Makerere University team and sought to improve the teaching and learning skills of participants, with a focus on curriculum design.

Introduction

The workshop *Improving Teaching and Learning at the University* was not included in programme planning from the beginning. It is instead a result of SLU's collaboration with Makerere University during prior parts of the programme and the fact that both SLU and the University of Rwanda participate in the *UR-Sweden Programme for Research, Higher Education and Institutional Advancement* (Agricultural Sciences sub-programme). Both the UR-Sweden programme and the *Innovative Doctoral Education for Global Food Security Programme* are managed by SLU Global. The resulting synergies and cross-pollination effects were therefore exploited.

The *Improving Teaching and Learning at University* workshop was a joint endeavour by SLU and the University of

Summary in Swedish

Workshopen *Improving Teaching and Learning at the University* var anpassad för erfarna lärare från Rwanda universitet och genomfördes i december 2014. Deltagarna hade stor erfarenhet av att undervisa och var även delaktiga i *UR-Sweden Programme for Research Higher Education and Institutional Advancement*. Utifrån det så kallade "train-the-trainer" konceptet var deltagarna utvalda utifrån sin framtida möjlighet och intresse av att föra information vidare och att träna sina kollegor. De deltagande prefekterna, dekanerna och inflytelserika professorerna föreföll redo att verka för framtida förändringar. Workshopen leddes av pedagoger från SLU och Makerere universitet och avsåg att förbättra deltagarnas förmåga att undervisa och lära ut men med tonvikt på utveckling av kursplaner.

Rwanda, with facilitation support from Makerere University.

About the University of Rwanda

The University of Rwanda is currently in a phase of transformation. After incorporating several research institutes and schools, it is undergoing transition to being the sole public university in the country. This amalgamation, which has brought together eleven different campuses into one, is still an ongoing process requiring a set of harmonization initiatives. In fact, several parallels could be drawn between this process and the context at SLU, currently also engaged in a project seeking to unify its many campuses and speaking with a common voice. Investing in pedagogy and educational development as a unifying factor at the university is a driving force propelling UR's interest in joining this initiative.

The project was supported by the highest level of the university leadership: the Vice-Chancellor, Professor McWha, opened the workshop session and was eager to stand behind the initiative, highlighting its quality assurance significance.

Workshop description, aim and objectives

The workshop was conducted between 17 and 19 December 2014 at the Hotel Nobleza, Kigali, Rwanda. To consolidate East African regional networks and exchanges already in place, the workshop was held at the University of Rwanda and featured a team facilitation spearheaded by both SLU and Makerere University. The Dean of the School of Education at Makerere University played an active part in planning and facilitating teaching and learning training sessions in both Uganda and Rwanda.

Twenty-five lecturers from four different campuses and five different faculties of the University of Rwanda participated. A large majority of them are responsible for programme development and curricular change, they were professors, heads of departments and deans, and held positions of influence and could translate insights from the training into future development of their own staff in these areas. Most also had extensive teaching experience and this was used as a point of departure for discussions.

With the aim of improving the participants' teaching and learning skills, the focus was on course design and the relationship between intended learning outcomes, teaching and learning activities and assessment. Attention was also paid

to how to integrate the perspectives of internationalization, gender-sensitive teaching, and education for sustainable development both when designing and when teaching courses.

Intended learning outcomes

Upon completion of the workshop, participants were expected to be better able to:

- reflect on his/her role as a lecturer in their own university context;
- apply the theory of constructive alignment in the preparation of their courses, justifying choices;
- justify choice of instructional strategy aimed at facilitating active learning in different contexts;
- integrate an internationalization perspective in the preparation of their courses.

Course content

The content of the course included:

- learning theories and trends
- development of intended learning outcomes
- teaching and learning activities
- methods of assessment
- integrating perspectives: internationalization, gender, and education for sustainable development
- individual course planning

Participant evaluation

The overall impression from the workshop is that the participants were very positive. The interactivity of the sessions between facilitators and participants and also between facilitators led to a creative atmosphere of active learning. The concept of constructive alignment with the delicate balancing of intended learning outcomes, assessment methods and teaching and learning activities was delivered and was well received since teachers can take home and begin using them immediately. The perspectives of gender-sensitive teaching, internationalization and education for sustainable development was questioned more and sometimes opposed. In particular aspects related to gender raised a considerable amount of discussion and sometimes reticence to see its value and importance in an educational context. This issue continues to be a sensitive subject, yet one that needs to be tackled if we hope to create open and enriching space for both male and female participants.

Participants appreciated the open facilitation and teaching methods:

“I liked the overall organization of lecturing (presentations) mixed up with interactions (all kind).”

“Facilitators interacting simultaneously during a session. It allows to have various views and a rich perspective.”

“The organization and the display of dexterity in teaching to motivate participation.”

“Facilitators interacting simultaneously during a session. It allows to have various views and a rich perspective.”

They also felt the content was relevant and came away with a clear view of constructive alignment:

“The workshop was very relevant to my work.”

“The links between intended learning outcomes – Assessment and teaching and learning activities.”

“Coming home with a clear constructive alignment.”

For future workshops they suggested the following areas could be included:

- doctoral supervision
- gender-sensitive teaching
- e-learning
- education for sustainable development

Conclusions

Based on workshop evaluations, participants found the workshop very useful and well worth recommending to colleagues. The most notable impact of this session is linked to the train-the-trainer aspect. In fact, several participating lecturers have already held their own workshops with their teaching staff and reported on their experiences.

The intention of the project’s engagement at the University of Rwanda was to build on an already existing platform, further benefiting identified key allies. For future sessions, it would be interesting to continue to use this train-the-trainer model to explore issues of doctoral supervision alongside a more advanced session of this workshop, which participants requested. ■



Photo: Lotta Hansson



Mobility – transfer of skills in modern techniques and methods, best practice and quality assurance routines through teacher exchange

Introduction

Nadarajah Sriskandarajah

Professor

SLU

Teacher exchanges with an international dimension have existed throughout history. The notion of a peripatetic professor and the itinerant scholar from many centuries ago reflect the international dimension of academic mobility in earlier times. Some well-known contemporary programmes that support formal teacher and student mobility include the Linnaeus–Palme exchange programme in Sweden, the Nordplus programme in the Nordic countries, the pan–European Erasmus teacher mobility programme and the Fulbright teacher exchange programme between the USA and the rest of the world.

Despite the extensive nature of this teacher exchange and mobility as an academic activity, the literature on the subject of teacher exchange and academic mobility is scant, particularly in terms of success criteria for the purposes of evaluation. However, there is general agreement that teacher mobility brings substantial benefits to the individuals involved and indeed that the individuals and the institutions experience change as an outcome of the exchange. The single most important benefit for the exchange teacher is a better understanding of higher education in the host country and more specifically the exposure to other, unfamiliar, pedagogic approaches, curricular designs and the more specific teaching methods. This aspect would be typically more pronounced in inter–continental exchanges (for example between Africa and Europe as in the current programme) than in intra– or other international exchanges.

The academic staff exchange component within the current programme has the same overall ambitions of capacity development for the participating teachers as some of the well-known programmes mentioned earlier, but with two main differences. One, the programme was set within the overarching theme of innovative doctoral education at the African institution the staff came from and therefore had a more one–sided emphasis on skills/technology/knowledge transfer from SLU to the receiving institution. Two, because of the focus on research to support global food security, the aims of the exchange had an explicit emphasis on learning of the more scientific methods and techniques relevant to global food security, although the coupling of technical knowledge acquisition with pedagogic and supervisory capacity was also emphasized as much as possible within the exchange programme. By and large, these ambitions appear to have been accomplished going by the experiences reported in the eleven separate reports that follow.

As stated above, the significant value of this portion of the programme was the availability of experienced researchers and the emphasis on transfer of relevant skills, technology or knowledge to the participants, and the choice of institutions and individuals through whom the overall goal of advancing innovative doctoral education could be enhanced. This is reflected in the range of scientific areas covered and the number and diversity of hosting academic departments at SLU that took part in the exchange.

About half of the exchange teachers were directly involved in learning specific advanced research techniques and best practices at SLU while the rest were exposed to a mix of research as well as educational/pedagogic experiences. The three scholars who visited the Department of Urban and Rural Development underwent more of a total immersion experience of a holistic kind and gained an understanding of the workings of an interdisciplinary department and its supportive and integrating role in the overall question of addressing sustainability and food security. They not only learned relevant research methods and techniques but also took part in classroom teaching encounters. In three instances, SLU expertise was taken to the overseas location, whereby a larger number of beneficiaries gained through participation in the specially designed courses. ►

If there was a significant drawback in the mobility programme reported here, that would be the brief period of stay of the visiting researchers/teachers at SLU and the limited opportunity they had to deepen the learning experience while here. While budgetary aspects would be the most important limiting factor in this context, the time available for a senior researcher to be away from their own institution, the interruption to their own teaching and/or research responsibilities and problems of finding replacement staff to cover their work should also be taken into account when designing mobility programmes.

The issue of continuity and further building up of the contacts and networks established through the exchange visits is also a significant aspect when evaluating the programme and the returns on investment of time and money. It is notable that in all cases reported here, participants were required to think about ways in which they would extend their SLU experiences to a wider audience at their home institution. In some instances, it is reported that plans for longer term collaboration between their home institution and SLU, and even ongoing teacher exchanges with external support, such as through the Linnaeus Palme exchange scheme, have been planned. Suggestions for how the present teacher exchange could have been made better have been reported, and these should be followed up by the project team and their partners.

The intercultural enrichment of the host institution's academic environment should be noted as an often overlooked form of benefit to the receiving institution. The expanded horizon of the visiting scholar and the direct and indirect benefits to their home institution through the mobility of academics as well as ideas have remained a hallmark of university development.



Advanced education in aquatic sciences and assessment

Project leader: Kevin Bishop

Objectives

There were two components to this exchange, one of which brought SLU alumni from the DRC and Ethiopia back to SLU for pedagogical capacity building. The other component supported a research planning course entitled Philosophy of research methods for two dozen PhD and MSc students at the Ethiopian Institute of Water Research that was held during two weeks at Addis Ababa University with the participation of three senior academics from Sweden.

Exchange between the Department of Aquatic Sciences and Assessment, SLU in Sweden and the Institute of Fishing at Mbandaka, University of Kinshasa and Christian Aid in the Democratic Republic of the Congo



Photo: Kevin Bishop

Adele Mputu, University of Kinshasa getting tips about statistics from her mentor, Eva Willén, SLU.

Background

SLU's Department of Aquatic Sciences and Assessment was approached in 2008 by the World Wildlife Fund (WWF) branch in the Democratic Republic of the Congo (DRC) for expertise and training to support their assessment of the Lake Tumba landscape with a focus on its vulnerability to degradation by land use and/or climate change. After

a visit in March 2009, with the WWF project leader on the ground in the region (Dr Inogwabini Bila-Isia), SLU undertook the licentiate education of two WWF employees, Adele Mputu and Norbert Zanga. In 2013, both completed their licentiates at SLU and both are now educators. Norbert is a lecturer at the University of Mbandaka near the Lake Tumba landscape and

Scholars in exchange

Norbert Zanga-Lingopa, Institute of Fishing at Mbandaka

Adele Mputu, University of Kinshasa
Inogwabini Bila-Isia, Christian Aid

Adele is in the process of joining the University of Kinshasa (UNIKIN). Inogwabini completed his PhD in environmental conservation at the University of Canterbury in the UK and spent a post-doc at SLU from 2011-2012. He is now responsible for Christian Aid in the DRC, with one of his goals there the establishment of the country's first private university.

Activities performed during the exchange period

All three of these SLU alumni are thus involved with education in the DRC and had the opportunity to benefit from the chance to develop their pedagogical skills. There are also researchers at SLU keen to help the universities in Kinshasa and Mbandaka to build up their expertise in aquatic sciences.

These SLU alumni from the DRC all participated in pedagogical courses organized by SLU. All three also conducted individualized projects that have been reported separately.

During the three month stay, these SLU alumni from the DRC all participated in pedagogical courses organized by SLU. All three also conducted individualized projects that have been reported separately.

Finally, a tutorial course in statistics pedagogics was specially arranged for Adele Mputu and Norbert Zanga. The tutorial course was led by Dr Claudia von Brömssen. It resulted in both Adele and Norbert returning to their home universities with statistics course package components that can be carried out using the open-source statistical programming language “R”.

Performed/planned activities at the home university after the exchange

Dr Inogwabini Bila-Isia has written a contribution to the revised version of *A Handbook for Doctoral Supervisors*, published by Nigel Beasley and Stan Taylor in 2005. The contribution focuses on an issue that is relevant to supervising students in the African context.

In addition to this, techniques and expertise that Inogwabini acquired through the training will be translated into action through the supervision of students at the Pedagogic University of Kinshasa where he has been offered a position in ecology at the Department of Biology from January 2015. The same techniques and expertise will also be helpful while developing the curricula for

a private university that he has been trying to set up in the DRC. Official documentation for this university has been acquired and a fund-raising campaign is currently under way.

Capacity building in an area with little specialized education has empowered some of the best qualified people from the region with respect to knowledge of sustainable use of aquatic resources to support the livelihoods and food security of people in the flooded forest areas of northern DRC.



Exchange between the Department of Aquatic Sciences and Assessment, SLU and Addis Ababa University, Ethiopia



Participants in the project course Philosophy of Research Methods held at the Ethiopian Institute of Water Resources in November 2014.

Background

In Ethiopia one of the most critical aspects of improving food security is variability in the hydrological regime. Thus soil/water conservation and irrigation at different scales are an integral part of the country's ambitious program for agricultural transformation. The three-year-old Ethiopian Institute for Water Resources (EIWR) was created to help improve the country's capacity for managing the water regime.

Ethiopia has committed itself to a major expansion of higher education. In the last two decades the number of universities has expanded from under five to over 30. As a result there is a great need for qualified academics to

teach the current generation of university students. The EIWR is a focal point for higher education in the field of water resources (including public health, engineering and governance).

Activities performed during the exchange

Dr Solomon Gebreyohannis Gebrehiwot began at EIWR as a post-doctoral researcher after completing his PhD at SLU in March 2012 and is now a permanent faculty member at EIWR, employed by Addis Ababa University. During the three month exchange period, he participated in courses in pedagogy and in field-based teaching with modern instrumentation to better equip him for his new responsibilities as a teacher and

Scholar in exchange

Solomon Gebreyohannis Gebrehiwot,
Addis Ababa University

mentor for EIWR's post-graduate students. The activities improved his capacity to contribute to graduate education at EIWR.

In recent years, 10–20 new PhD students have enrolled at EIWR annually (3-year programmes) along with another 20–30 MSc Students (2-year programmes). All these students need to complete research-based theses. Preparing research plans is a critical task for each student, where expert supervision and mentoring can be of crucial importance. During the exchange period, Dr Gebrehiwot created a course entitled Philosophy of research methods, designed to support these students' research planning and involve more senior academics from outside Ethiopia in EIWR's work. The course was a critical component in helping both the PhD and the MSc students transition from the course component of their degree programmes to the independent research component. Further, it also gave Solomon Gebreyohannis a chance to implement the pedagogical skills that he had learned during his educational exchange at SLU.

The involvement of senior staff from Sweden in this course made a substantial contribution to the thesis research planning of the two dozen students involved. There were also a good opportunities to involve more senior academics in the network of thesis supervisors that the PhD and MSc students could get access to for their entire study period. I think this served as a catalyst for establishing connections with SLU's expertise. Suggestions for how to improve future exchanges

The exchange of teachers has created excellent opportunities for pedagogical capacity building and mentoring of academics in both the DRC and Ethiopia but there is so much more to be done. A long-term programme that facilitated a two way exchange would be desirable. One component would be to give lecturers from low-income countries the opportunity to have access to SLU's pedagogical courses – either in Sweden or in their home country. Another aspect is to help Swedish academics become involved in supervising the training of PhD students registered at universities in low-income countries. ■

Advanced education in agroforestry and soil management

Exchange between the Department of Chemistry and Biotechnology, SLU and the School of Agricultural Engineering and Environmental Management, University of Rwanda

Project leader: Anke Herrmann

Objectives

A University of Rwanda (UR) MSc programme is currently being revised and Professor Jean Nduwamungu, the programme coordinator, visited SLU to learn course structures, content and pedagogical methods in order to communicate research outcomes to students as well as familiarize himself with routines for quality assurance.

Background

Rwanda has a high population density and low agricultural productivity and therefore there is a great demand for agricultural development. Agroforestry is an ongoing land-use practice in the country, but due to the complex landscape and shortage of farmland further develop agroforestry is needed to improve sustainability of food production and to enhance livelihoods.

An MSc programme in Agroforestry and Soil Management (ASM) at UR was established in 2005. The programme is part of a capacity development collaboration between UR's Faculty of Agriculture and the SLU. The collaboration includes five MSc programmes and the ASM programme has been in place since 2005.

Activities performed during the exchange period

During the ten days stay Jean Nduwamungu and Anke Herrmann, who is responsible for the programme revision, met with SLU staff involved in agroforestry and soil science and other related research areas. During these meetings, they discussed the organization, design and quality assurance of academic courses

The summarized experiences of relevance to the revision were used as outlines for the course plans of current and new courses within the ASM programme. A study handbook, currently under production, was also discussed and brought forward so that it can be



Photo: Sigrun Dahlin

University of Rwanda.

adopted within the revised programme. A form for Student module evaluation was also compiled.

Additionally, Jean Nduwamungu participated at the public PhD thesis defence of Gustaf Nestor (doctoral student at the Department of Chemistry & Biotechnology) and also attended a public seminar on a project carried out at the Department of Forest Mycology and Pathology.

Jean also met Dr Sigrun Dahlin (Department of Soil and Environment) and Dr Gert Nyberg (Department of Forest Ecology and Management) to discuss the admission of Ms Marguerite Mukangango (a staff member at UR) to doctoral education at the Department of Soil and Environment at SLU. ■

“Due to the complex landscape and shortage of farmland further develop agroforestry is needed to improve sustainability of food production and to enhance livelihoods.”

Scholar in exchange

Jean Nduwamungu, University of Rwanda

Training in modern techniques in soil ecology

Exchange between the Department of Ecology, SLU and Embu University College, Kenya

Project leader: Jan Lagerlöf



Photo: Jan Lagerlöf

Jamleck Muturi John (Embu University College) and Fredrick Ayuke (Nairobi University) in a lab at the Department of Ecology, SLU, sorting out earthworms from a lab experiment on interactions between earthworms and soil-borne plant diseases.

Objectives

- Initiate an exchange between faculty members from SLU and Embu University College (EUC).
- Work with department members and administrators at the two universities and other institutions to develop research, education and extension/outreach programmes.
- Initiate an exchange between students from SLU and EUC.
- Develop proposal(s) for external funding to implement collaborative programmes.

Background

Like most developing countries, Kenya is struggling to develop a sustainable intensification of its agricultural production and use of natural resources in order to meet the ever increasing needs of a growing human population. Natural habitat, wildlife and land are extremely important to Kenyans, but their conservation can conflict with both crop and animal farming. Good university research, teaching and outreach programmes are key to both developing approaches for sustainable management of natural resources and the training of capable future leaders.

Scholar in exchange

Jamleck Muturi John, Embu University College

Activities performed during the exchange period

During the six-week exchange period, Jamleck conducted advanced research studies together with Jan Lagerlöf and Gabriella Jorge in his area of scientific interest on earthworms and their interactions with bacteria.

In a seminar at the Department of Ecology on 9 September 2014, Jamleck presented the collaboration and research opportunities between SLU, EUC and Kenyatta University (KU).

In order to prepare for a Linnaeus-Palme application, Jamleck met with teachers and researchers from several departments at SLU to discuss opportunities for collaboration in research and education.

Performed and planned activities at EUC after the exchange

Jamleck held a presentation for departmental heads at EUC on his experiences and the prospects for collaboration and research opportunities between SLU, EUC and Kenyatta University (KU).

He trained laboratory technicians in earthworm research and is currently engaged in assessing the abundance and diversity of earthworms in different land use systems in Embu, Kenya.

Finally, he is planning to undertake research with other lecturers from EUC and SLU in various research areas in conservation, ecology and agriculture in Embu County and its environs.

Most important lessons learned

According to his evaluation Jamleck very much appreciated the exchange visit. He upgraded his skills in earthworm classification, rearing methods and developing protocols essential for making various bioassays and he gained significant knowledge essential to teaching zoology to both undergraduate and postgraduate students at the university. He also upgraded his skills in proposal writing, scientific publication and report writing.

An application for Linnaeus-Palme funding was produced together with Jan Lagerlöf and other teachers from the two universities. This funding is intended to enhance future exchange visits between teachers and between students at the two universities. Linkages are being enhanced between SLU and EUC for future broad engagements in research and networking.

EUC's top university leadership, teachers and



Photo: Jan Lagerlöf

Jamleck Muturi John (Embu University College) and Fredrik Heyman (SLU) collecting soil for a greenhouse experiment with soil-borne plant diseases and soil organisms.

students showed great interest in the activities undertaken during the exchange. A large number of suggestions for future joint research and teaching exchange is being developed by the staff and students.

Suggestions for improving future exchanges

- The exchange duration should be extended.
- Funding could be increased to include laboratory technicians and even training of lecturers in specific areas of interest relevant to research/teaching. ■

Introducing interdisciplinary research methods and a scenario modelling tool

Exchange between Wondo Genet College of Forestry and Natural Resources, Ethiopia and the Department of Forest Resource Management, SLU

Project leaders: Mats Sandewall, Motuma Tolera and Dong-Gill Kim



Photo Mats Sandewall.

Presenting and discussing research outputs at local level provides additional knowledge and understanding among researchers and farmers in Shoba village, Ethiopia.

Objectives

- To introduce teaching staff to a scenario modelling tool
- To introduce doctoral students to interdisciplinary research methods and build their competence
- To provide a much needed opportunity for a field component in a course

Background

There are nearly 1 billion poor people in the world, while some 1.6 billion people globally rely on forests and other natural systems for their livelihoods. Further, 40% of the food in low-income countries is produced by

small-holder farmers living in or near forests. Intensification of production in agricultural landscapes contributes to increased food production, but not necessarily to significantly reduced poverty and vulnerability among rural people. Rather, the dynamic processes of land use, food production and land management in forest landscapes, in particular in the context of forest rehabilitation, are important to livelihoods, biodiversity and food security. While local people take the final decisions on land use, the frames and conditions for making those decisions are often set by policies.

The issue of food security is by and large multi-disciplinary. It includes

Scholars in exchange

Mats Sandewall, SLU
Ulf Söderberg, SLU

for example socio-economic, environmental and forest policy aspects, as well as dimensions of scale and time. In order to address this in research, education, and forest and land management, there is a need to use and integrate a range of different methods.

The present exchange was connected to a university college and to an academic programme with a focus on climate change and forestry. In such a programme, there is a need for interdisciplinary methods that connect landscape and forest changes to the local and global society.

Activities performed during the exchange period

The project was implemented in Ethiopia during October and November 2014 in collaboration with Hawassa University's Wondo Genet College of Forestry and Natural Resources, Ethiopia.

With the purpose of introduce a scenario modelling tool among the college's teaching community and provide an understanding of and ideas for how it can be used in education and research, a *two-day introductory training course for teaching staff* was held. Ten people attended in the entire course. About five additional teachers and resource staff attended, partly depending on other commitments. Two resource staff from CIFOR's Addis Abeba office who had been contacted earlier also took part and contributed comments and ideas.

Based on discussions with the college and agreement among the trainers and their counterparts regarding the target group (PhD students), it was agreed to particularly address a group of ten local PhD students through a field-oriented PhD course on forest and land use scenario modelling. After surveying the field site, organizing the field component, and updating and adapting the Users Guide to the situation in Ethiopia, a ten-days course including introduction, field component, and analysis and report was held. To conclude the course, the students presented and discussed the output with the stakeholders at the field study site. Two participants in the introductory teacher training assisted in the PhD course. An additional 10 students participated in the seminar for MSc students held on one of the last days.

The pedagogic idea of the course was to introduce and build competence in interdiscipli-

“The good example of how to integrate theory with practice via field visits was rated highly in the course evaluations.”

nary research methods that can be useful to forestry and natural resource students in targeting issues of food security and societal and environmental change. For the purposes of research, natural resources policy development and local forest and landscape management, the following demands were addressed:

- conceptual awareness in relation to modelling and landscape change;
- an overview of landscape trends and their driving forces in different global regions;
- understanding of the general ideas of land use scenario models;
- hands-on competence with the model chosen for the course;
- understanding requirements regarding input data, and various methods for data collection;
- outlining and analysing scenarios;
- presentation and discussion of scenarios;
- ethics and competence in working with local farmers and stakeholders.

Finally, the PhD programme, and education at the college as a whole, lacks the resources to carry out education and research training outside the classroom. This course aimed to provide a much needed opportunity for a field component in a course.

By the end of the course, the participants were able to apply the scenario model introduced in the course, understand its strengths and weaknesses and also how it can be adapted and used as a tool in research on and analysis of forest management and policy issues.

According to the evaluations, the teaching staff appreciated the course since it provided knowledge and experiences related to their interests. The focus on the importance of accurate data collection, developing suitable scenarios and interpretation, dealing with uncertainties, identifying implication and implementing results by providing feedbacks to local communities was also considered valuable. Finally, the good example of how to integrate theory with practice via field visits was rated highly.

The course was much appreciated by the PhD students. There were various comments and concerns regarding the quality of input data, the flexibility of the model and the limited duration



Photo Mats Sandewall.

Interdisciplinary methods, combining measurements and observations with farm level discussions, were applied during the scenario training course in Shoba village, Ethiopia.

of the course, but most students stated that they had acquired new knowledge and ideas and some students were considering using the scenario approach in their work.

A long discussion took place on the relevance of and possibility to include a final meeting with stakeholders. To begin with, some of the students were reluctant and did not see the point. They felt they had not had time to do a proper data collection and did not have anything to tell the farmers that they did not know already. Ultimately, nearly all students agreed to take part and the meeting turned out as a much appreciated discussion between students and villagers on resource management matters without any direct reference to scenarios or collected data.

Suggestions for improving future exchanges

A key to the success of the course was the well-integrated field exercise. If another project of the type presented in this report were to be held, sufficient time to plan it jointly with the counterpart organization is important, as it is

site-specific and needs to be adapted to the local situation and awareness, including surveys of field sites, etc.

To address food security issues in a university environment it is important to promote approaches that link research, teaching and developmental activities.

List of participating teachers

Tesfaye Ishine, Kebede Wolka, Amare Sisay, Zenebe Girmay, Goitom Takele, Hafie Mebrahten, Wt Tessema, Genet Negash, Yared Girma and Yadeta Teshome.



Development of interdisciplinary approaches and practices in education and research

Exchange between the Department of Urban and Rural Development, SLU and Mekelle University, Ethiopia

Project leader: Kristina Marquardt

Objectives

The major objective of the exchange programme was to develop interdisciplinary approaches and practices in education and research.

Background

The Department of Urban and Rural Development (URD) at SLU runs many interdisciplinary research projects and interdisciplinary educational programmes (both undergraduate and post-graduate studies), and has experience of and methods for planning and conducting interdisciplinary research and education. As the research cultures in natural and social sciences can be quite different, various methods and approaches to overcome these differences are needed for successful interdisciplinary research.

Dr Girmay Tesfay is trained in agricultural economics and resource management with a development policy focus. He was involved in a Sida-funded project on *Agroecology in practice: Training and education*, a collaborative project between SLU, Mekelle University and Uganda Martyrs University. The project was designed to develop the capacity of experts involved in designing food security and rural development programmes for small-scale farmers in the highlands of Ethiopia and facilitated the creation of an MSc programme in agroecology and sustainable development and a summer school in agroecology.

Activities performed during the exchange period

During the several month long stay interaction was accomplished with teachers and researchers at URD facilitating courses for MSc and PhD programmes on *Interdisciplinary practice* and *Methodological approaches to interdisciplinary research*,

respectively. Course plans and contents for the two courses and the learning and assessment techniques were also assessed and the recommended literature reviewed. The design of the course and methodologies for facilitation, including students' roles and assessment techniques, were analysed.

The learning was supplemented through discussion with students who attended interdisciplinary courses, to get the learners' perspective, and through attendance of various seminars on interdisciplinary issues. Further, the literature recommended for the two courses was reviewed and complemented by visits to sessions of interdisciplinary courses.

The course plan for the course in *Systems analysis and agroecosystems* offered to MSc students in agroecology and sustainable development at Mekelle University was also revised and a new chapter on interdisciplinary practices was integrated. The course is one of the core courses in the MSc programme. Taking the objective of the course and the experience gained during the exchange period, a new chapter has been designed on interdisciplinary concepts and practices. The chapter builds on the systems concept. The students are expected to work on complex issues such as food security, climate change and sustainable development of small-scale agriculture. Knowledge of and practical skills in interdisciplinarity are needed when the students address complex problems. The chapter aims to address this learning outcome.

During the exchange period, Dr Tesfay participated in:

- ten interdisciplinary seminars on various themes relevant to food security and sustainability education
- a seminar on educational methodology
- Educational development across

Scholar in exchange

Girmay Tesfay, Mekelle University

borders: Strengthening global food security which was a learning session on policy and pedagogical issues related to quality education where he presented his experience from the Agroecology education MSc programme that was implemented in partnership with SLU and Uganda Martyrs University.

In accordance with the plans, case studies were presented at the workshops ‘Scaling up’ strategies – from technology transfer to empowerment with a focus on sustainable agriculture production and food security (28-29 August 2014, Uppsala) and Agriculture intervention and nutrition linkage (2-5 November 2014, Cork, Ireland).

Planned activities at the home university

- Feedback seminar at the home department on interdisciplinary approaches in research and education. The seminar will be arranged during the first term of the academic calendar (January to February 2015).
- Tracer study of graduates from the agroecology programme to be conducted in collaboration with the agroecology programme coordination at Mekelle University to learn from the experience of alumni on the relevance of the knowledge and skills acquired during their training and their current job demands. The results will be used to develop a case study paper on opportunities for and constraints on education for sustainability.
- Contribute to PhD programme development in agroecology education at Mekelle University

Most important lessons learned

In his evaluation of the exchange, Dr Tesfay emphasised the importance of learning about the rationale and motives for interdisciplinary approaches; their evolution in the academic and practice; development so far; clarity of concepts and scope of interdisciplinary approaches; different methods used in practising interdisciplinarity; practice of interdisciplinarity in education and research; challenges/barriers/constraints in promoting interdisciplinary approaches in education and research.

Facilitation techniques and evaluation methods were also learned and trained.

Concluding remarks

Exchange visits should lead to sustainable collaboration. Areas have been identified for collaboration in teaching and research that will be pursued after the exchange period. A concept note was developed together with staff from URD and the National University in Nicaragua for the development of a PhD level programme in the area of agroecology and rural development.

A proposal for a staff exchange was developed and submitted for support through the Linnaeus-Palme programme for 2015/2016. Future collaboration on pedagogical training for staff at Mekelle University was discussed with SLU’s Centre for Pedagogical Development.

Identified interest in research collaboration with SLU staff

- Agriculture development interventions and nutrition linkage. Further possible areas of research by MSc and PhD students that may be linked to current effort have also been discussed.
- How can ecosystem services be considered in our agricultural systems, as well as natural resource management programmes, issues of payment, issues of benefit distribution, how people mobilize, local resources for investment, role of other actors, etc.
- Land-taking and compensation: impact on livelihood of smallholder farmers in Ethiopia. Urban expansion in Ethiopia is through land-taking. A concept note has been shared and a proposal for funding is under development.

Suggestions for improving future exchanges

It is important to maintain the link with those who have participated in exchange programmes to track their development and provide back-up. In this case, continued support from SLU would be required to promote staff seminars on postgraduate supervision and development of interdisciplinary MSc and PhD programmes of relevance to sustainable development. Cycles of pedagogical training with the support of the Centre for Educational Development at SLU would also be desirable. ■

“It is important to maintain the link with those who have participated in exchange programmes to track their development and provide back-up.”

Training in modern technologies, research methods and contemporary approaches to rural extension

Exchange between the Department of Urban and Rural Development, SLU and Universidade Eduardo Mondlane, Mozambique

Project leader: Nadarajah Sriskandarajah

Objectives

Learn to use modern technologies, research methods and contemporary approaches to rural extension and facilitation of change in the face of complexity.

Background

Dr Eunice Paula Armando Cavane, trained in agricultural extension and education, is coordinating an interdisciplinary study on *Systematization of Mozambique community lands initiative experiences on demarcation of community lands in the context of implementation of land law*. Land is a basic resource for food security and economic development. Securing community land tenure, through land delimitation and demarcation, is therefore very important to secure food production and availability. The study combines various disciplines, namely law, sociology, agronomy, forestry, political science, and geography.

Dr Cavane is also involved in teaching *Introduction to research methods* for undergraduate students in agricultural economics and extension and as administrator is responsible for pedagogic development at the Faculty of Agriculture and Forestry Engineering (FAEF).

Activities performed during the exchange period

During the one and half month long stay, the training focused on systemic and communication-oriented research and education in relation to agriculture, land use, innovation systems and extension for addressing food security and environmental management questions.

The objectives of the exchange project were:

- to participate in ongoing field research projects;



Eunice Cavane when presenting at the Department of Urban and Rural Development, SLU.

- to learn workshop methods such as future creating workshops through participating in them;
- to follow the work of the curriculum planning committee at the SLU Division of Environmental Communication (EC);
- to discuss with colleagues and observe their practices in relation to farming systems research, modern extension methodologies, soft systems and hard systems research methodologies and tools, and systemic action research approach.

The stated objectives were achieved as planned through participation in the EC's planning, workshops and seminars, and discussions with colleagues in relation to teaching and research methodologies.

The following workshops and semi-

Scholar in exchange

Eunice Cavane, Universidade Eduardo Mondlane

nars were attended during the exchange period:

- the scaling-up workshop and seminar on new ruralities in Falkenberg, Sweden, to learn workshop methods through participating in them
- seminar by PhD student Christina Lundström
- defence of PhD thesis by Andrew Butler
- class sessions on systems thinking given by professor Sriskandarajah.

Dr Cavane presented *Sharing experiences on farmers attitudes and adoption of improved maize varieties and chemical fertilizers in Mozambique*” at a seminar at URD. She also prepared a joint publication, “Farming systems within protected areas: dealing with drought and elephant invasion in Limpopo national park, Mozambique”, within the context of Nicia Givá’s PhD programme.

Participation in ongoing field research projects was somewhat limited, mainly due to the fact that the planned visit overlapped with the beginning of the term and the main focus was on teaching. Also, some projects such as the Nicaragua project on natural resources management were in the evaluation phase and participation was thus possible through attending presentation seminars and next-phase planning meetings.

The process to attain the objectives also involved intensive reading as an additional activity to the planned activities. The reading materials covered topics on systems thinking, phenomenology, action research and environmental communication.

The main outcomes of the teacher exchange project were increased awareness rising and the formation of a positive attitude towards the importance of a systemic approach to real problems featuring in agricultural development, and the need of for coordinated action by stakeholders to improve problematic situations experienced by actors in the agricultural sector. Awareness was also increased in relation to: (i) facilitation of learning among farmers, i.e. creation of conducive learning environments in order to improve food security; (ii) the importance of understanding communication processes (communication models and the content of the messages) between farmers and extension agents as a way to improve facilitation of change; (iii) increasing of motivation of social and natural sciences students in relation to holistic approaches to real (work) pro-

blems; (iv) strengthening theoretical frameworks to inform holistic approaches.

Proposals for follow up action/implementation

There are two proposals for follow-up.

Proposal one: *Strengthening students’ and the faculty’s skills in dealing with real complex problems*

In collaboration with EC, FAEF will apply for a Linneaus–Palme programme for a two-year exchange teacher project, whereby professors from EC can visit FAEF for lectures, systems thinking, communication in agricultural extension, and facilitation of learning for agricultural development, primarily using problem-based projects teaching methods.

The ultimate goal would be to adapt the curriculum to help students develop skills to work with real complex problem situations.

Proposal two: *Create a new research line for division of communication and agrarian sociology to facilitate innovative ways for understanding agricultural reality* This will require development of an action research project proposal, either for experimenting with “Creation of the best learning environment for farmers” or “Analysing experiential learning processes in farmer field schools”. This can also involve research on communication strategies between farmers and extension agents during implementation of extension programmes.

Both of the topics presented above would involve selection of region-based extension systems, within the country, that would work collaboratively with FAEF and EC to facilitate learning among farmers and between farmers and other relevant actors at the regional level.

The ultimate goal would be to help farmers make decisions to change/improve farming practices by themselves. This will require the use of action research methods guided by principles of experiential learning and systems thinking. Rich pictures of the farming systems will be developed, discussed and agreed by all relevant stakeholders including researchers (UEM, SLU), the Ministry of Agriculture and NGOs (extension personnel), the Ministry of the Environment (environmentalists), the Ministry of Health (nutritionists) and the private sector (market), in order to implement coordinated action to improve agricultural production and food security. Our experiential learning focus is thus on learning about farming systems. ■

“The ultimate goal would be to help farmers make decisions to change/improve farming practices by themselves.”

Learning about implications of interdisciplinary approaches and practices in education and research

Exchange between the Department of Urban and Rural Development, SLU and Sokoine University of Agriculture, Tanzania

Project leader: Örjan Bartholdson

Objectives

- to understand and modify new research methods so that they can be applied at the home university where the technical equipment is less advanced than at SLU
- to learn about interdisciplinary approaches and practices in education and research
- together with colleagues, to give the course *The process of research theories and methods*.

Background

Dr Jumanne Moshi Abdallah, trained in natural resource economics, is involved in two interdisciplinary projects at the Department of Urban and Rural Development (URD): (1) *Paying for ecosystem services: consequences and alternatives* (funded by the Swedish Research Council), and (2) the PhD project *Large-scale agro-investments in Tanzania – impacts on land access and food security* (Funded by Sida and Formas). Both projects have connections to strategies for agricultural production and implications for food security.

Activities performed during the exchange period

Using modern techniques and research methods

In order to understand and modify new research methods so that they can be applied at the home university where the technical equipment is less advanced than at SLU, Dr Abdallah regularly attended the lectures on the master programme in *Rural development and natural resource management*. He also gave a couple of guest lectures to try out these newly acquired methods.

Several of his colleagues within the PECA research project (an interdisciplinary project on payment of ecosys-

tem services) were also at SLU during the exchange period. They held regular seminars to discuss experiences of field work in the countries concerned (Nepal, Tanzania, Brazil and Peru) and of how the methods could be refined. They also discussed how to combine agricultural and social science methods in practice during future fieldwork. The challenges of interdisciplinarity were also brought up and how these approaches fitted the reality during extended fieldwork. These discussions within the PECA group were then transmitted to the teachers, who discussed how ongoing research could be integrated in the education.

Additionally Dr Abdallah and Dr Örjan Bartholdson, senior lecturer at SLU and a member of the PECA research group, also worked on two scientific articles where ethnographic methods used in case studies in Tanzania were presented as empirical findings.

Study on interdisciplinary approach and pedagogical aspects

The second major objective of the exchange programme was for Dr Abdallah to learn about interdisciplinary approaches and practices in education and research. This was achieved through interaction with teachers and researchers at URD, e.g. discussions on syllabus and course schedules to see how they were constructed and also helping to facilitate the courses. An interesting issue was a comparison of how knowledge at Sokoine University of Agriculture (SUA) and SLU was conveyed and how the students were activated during the courses, not least concerning gender aspects. It was also rewarding to discuss with the MSc and PhD students how they perceived the education and compare their assessments with the teachers' intentions.

Scholar in exchange

Jumanne Abdallah, Sokoine University of Agriculture

Bridging South-North in education

During the exchange period at SLU,

senior lecturers Örjan Bartholdson and Kjell Hansen held the course *The process of research theories and methods*. The syllabus, content and pedagogics were analysed and future changes which would better incorporate aspects like a clearer ‘South’ perspective, more comparative examples between Europe and East Africa, as well as a stronger focus on current research at the URD were agreed upon. These insights will be drawn on when designing the next research methods course at the Department of Forestry at SUA.

One of the ethnographic problems discussed was the *verfremdungs*-effect that working with an interpreter creates and how this distancing can be mitigated during field work. The effect might also be an asset in certain circumstances, enabling the researcher to lose the feeling of sharing and belonging, and making the researcher regard even the familiar as something that is perceived from a new perspective that has to be analysed in novel ways.

Participation in research seminars at the department
Dr Abdallah attended three PhD seminars during his stay at SLU. He found the content interesting, but perhaps even more rewarding was to study how research seminars are structured at SLU. At SUA, more emphasis is on the opponent/examiner and the PhD candidate is given less space and time. Both structures have their respective advantages but there is a need to clearly articulate the intended outcome of the seminar. There is a risk that one will simply adopt the structure and practices that are traditionally used without considering if they constitute the most efficient form to achieve the intended objective with the seminar.

Participation in research seminars outside SLU

Dr Abdallah participated in five seminars at the Nordic Africa Institute (NAI) that is located in Uppsala and is focussing on the research areas of the PECA research project. At three of these seminars, where several researchers from URD participated, the focus was on livelihood, small-scale agriculture and poverty. All research projects presented were interdisciplinary and

both the content of the research and the methods used to gather empirical data were discussed.

“The exchange of research and education between SLU and Sokoine University of Agriculture should continue.”

Planned activities at Sokoine University after the exchange

- recruit one master student at URD and one at SUA to conduct research on agro-forestry and payment of ecosystem services working as a team and thus sharing disciplinary and area knowledge with each other

- arrange a couple of seminars on interdisciplinary research and methodology during the spring term 2015 (January-June)

- incorporate lessons learned on social theories and methods in courses at the Forestry Department at SUA

- integrate more ethnographic methods in agro-forestry education at SUA

- revise PhD seminars in order to extend the focus on the students’ theoretical and methodological approaches.

Overall assessment

In his evaluation of the exchange, Dr Abdallah ranked the following knowledge and skills gained at SLU:

Education

- improvement of didactic knowledge and skills
- how to teach adequate social theories and methodology to natural science students
- how to bring in a more comparative South-North perspective in the education
- how to integrate more research perspectives in the education
- how to apply ethnographic methods in interdisciplinary research
- how to write and structure a syllabus.

Research

- how to combine agricultural and social science methods in practice during field work
- bridge methodological gaps between research and education
- novel ways to organize and structure PhD semi-

nars

- comparisons of how to empirically study livelihood, agroforestry and poverty
- novel ways to construct research articles.

The exchange of research and education between SLU and SUA should continue. In education, efforts will be made to enable students from URD to be granted MFS scholarships and conduct fieldwork together with MSc students from SUA.

Students from SUA should also be encouraged to apply for scholarships in Sweden so that they can enrol in the *Rural development and natural resource management* MSc programme. The current research collaboration within the PECA research project will continue for another year (2015). Subsequent application potentials involving SLU and SUA should be focused on how agriculture and forestry are integrated in an overall landscape perspective. ■

Training in epidemiology and disease control

Exchange between the Department of Clinical Sciences, SLU and the School of Veterinary Medicine, University of Zambia, Zambia

Project leader: Elisabeth Persson



Group discussions at the EpiNOVA advanced course in epidemiology in Tallin, Estonia, September 2014.

Objectives

- to extend Dr Saasa's knowledge, for example by developing teaching material in statistics and epidemiology to be used in disease control and veterinary public health education activities
- to discuss a possible future exchange programme between the Department of Clinical Sciences (KV) and UNZA
- to improve pedagogical skills by attending the *Teaching in higher education, basic course*.

Background

The applicant, Dr Ngosa Saasa, is a lecturer and researcher at the Department of Disease Control at UNZA. Dr Saasa conducted his postgraduate studies in virology at Hokkaido University in Japan. There are several aspects

of virology that relate to global food security. Diseases prevalent in Zambian livestock are both zoonoses, i.e. threats to human health, and as such limit the animals' productivity, both having environmental effects (with more animals being needed) and decreasing access to food of animal origin. This affects the farmers' economy at a national level and the mere presence of certain diseases limits international trade opportunities.

Activities performed during the exchange period

The exchange period was three months. The EpiNOVA advanced course in epidemiology (Tallin, Estonia)

On his arrival, Dr Saasa participated in the EpiNOVA advanced course in epidemiology on data quality (data vali-

Scholar in exchange

Ngonda Saasa, University of Zambia

Photo: Ulf Emanuelson

dation, bias, quantitative bias analysis, models incorporating bias parameters, missing data imputation). The course was organized under the NOVA University networks and was held from 17 – 23 September 2014 in Estonia.

During his stay, Dr Saasa learned to use the “R Statistical” program. It is a useful program for epidemiological and other statistical applications. It has potential for extensive use at UNZA because it is free.

Dr. Saasa took an active part in the “Basic epidemiology course for masters students” from September to December 2014 and had plenty of interactions with staff members at KV regarding department and course structures, teaching, assessment and evaluation, grading and student progression. A visit to the Lövsta Livestock Research Station, where SLU has various farm animal facilities including a modern dairy cow unit, as well as visits to other university animal facilities were performed.

A possible future exchange programme between KV and UNZA was discussed. A Linnaeus-Palme exchange programme was considered that would strengthen ties between SLU and UNZA. In this effort Dr. Jonas Johansson Wensman took on the role as coordinator and an application for a planning visit for teacher exchange was prepared.

Dr Saasa also visited the University of Helsinki, Finland, and had a full-day interaction with Dr Anna-Maija Virtala through presentation, discussion and exchange of views on teaching in higher education and veterinary epidemiology. Dr Virtala has been instrumental in the promotion and development of university pedagogy, including modern teaching methods in veterinary epidemiology at her university.

To elaborate further on teaching and learning in higher education, Dr Saasa attended the *Teaching in higher education*, basic course during October and November 2014. The activities included reflection on the university as an organization. Other issues were theories of teaching and learning, the characteristics of good teaching, and constructive alignment. The “Speak out!” session focused on how to effectively deliver a message as the essence of teaching. Finally, group work theory and the critical aspects of gender-sensitive

teaching in higher education were introduced.

“It is also important to introduce experiential learning because most students have to transform the theory they have learned in higher education to their professional activities.”

Dr Saasa had the opportunity to observe educational activities in different formats (e.g. lectures, group discussions, project presentations and practicals) and at different educational levels. Dr Saasa appreciated the cordial and friendly learning environment and found the teacher-student gap to be narrow and interactive. The students

had sufficient time allocated to group activities, which they appeared to appreciate very much.

Together with other visiting researchers Dr Saasa took part in a lunch seminar at SLU on the theme of *Educational development across borders: Strengthening food security*. During the discussion they shared and exchanged views on teaching and learning from their respective institutions in Ethiopia, DR Congo and Zambia, and also with Swedish counterparts.

Planned activities at UNZA after the exchange

Challenges

Most activities will require both human and financial resources, which is a challenge for UNZA. Such activities will also require that space be made for them in the learning environment.

Opportunities

The experience gained from the exchange has given in-depth reflection on teaching. Without much adjustment, there are a number of activities that can be implemented or fused into the current system without interfering with the normal running of the school.

One pedagogical message was obvious: *what the student does matters more than what the teacher does*. This implied that although lecturers were a central part of learning and teaching, active participation by the student has a positive effect on the learning outcome. It is also important to introduce experiential learning because most students have to transform the theory they have learned in higher education to their professional activities. Gender aspects in higher education are a huge challenge but important to increase awareness of.



Group photo from the EpiNOVA advanced course in epidemiology in Tallin, Estonia, September 2014.

department, unit and course level. It would be worthwhile investigating the possibility of establishing pedagogical units in the university and its faculties.

Curriculum review

One critical element presented at the course “Teaching in higher education, basic course” was the aspect of constructive alignment. Although the objectives are generally regarded in the design of curriculum, nevertheless, incorporating the aspect of constructive alignment would make the course designer to consider what activities are critical for particular objectives or learning outcomes. Not only would constructive alignment facilitate focus on learning and teaching activities, but also prevent duplication of activities in the process. This would create more time for other activities, which is especially valuable as time is always scarce.

Course evaluation

There can be no improvement and erosion of educational standards of teaching and learning if evaluation of some kind does not take place. Evaluation of teaching and learning activities should be focused on how the teaching environment can be improved or prevented from deterioration. ■

The following activities will be slowly introduced into the teaching process based on the premise of constructive alignment:

- clarification of intended learning outcomes of courses
- the purposes of the teaching and learning activities
- the importance of assessment methods.

Other activities would include involvement of students through discussions and reduction of the lecture hours as well as inclusion of evaluations (topics, practicals, lectures and discussions etcetera).

Establishment of university pedagogical units

It would be worthwhile to see how pedagogic units can be established at the various faculties of UNZA. Helsinki University, for instance, has representatives at every unit who are involved in teaching and learning development at the university. Such a framework could be put in place and filter down from the university level to faculty,

Training in modern biotechnological techniques and good laboratory practices

Project leader: Larisa Gustavsson



Photos: Larisa Gustavsson

Material and DNeasy plant kits (left). Germination of seeds and plant seedling (right).

Objectives

To provide training in laboratory expertise and skills in molecular characterization of watermelon germplasm.

Background

The watermelon *Citrullus lanatus* is one of many economic species in the gourd (Cucurbitaceae) family that are of particular importance to the inhabitants of southern Africa. Cucurbitaceae species are eaten in several different forms, as seeds, leaves, fruits and some-

times flowers, by villagers throughout Africa. Among the myriad problems facing southern African agriculture are the prevalent droughts and the dependence on too few crops, leading to low food security. There is thus a need for a turnaround strategy in which the underutilized traditional crops such as watermelon, that are drought-tolerant are promoted. There is scant or very little information on the existing diversity of *Citrullus lanatus* and its distribution in the region from Namibia across to Zimbabwe.

Exchange between the Department of Plant Breeding, SLU and the Genetic Resources and Biotechnology Institute, Zimbabwe

Activities performed during the exchange period

During the exchange period from June to December 2014 Mrs Musango, Genetic Resources and Biotechnology Institute (GRBI), Zimbabwe, received training in using modern techniques, including molecular markers, SSR (Simple Sequence Repeats) in watermelons. She had previous experience of morphological characterization of genetic resources in

watermelon and has now also widened the field of her expertise to the research methods of molecular characterization.

During the training, Mrs Musango was supervised by two senior scientists and a laboratory technician. This gave her the opportunity to be trained in various types of supervision. She was also trained to instruct colleagues in the skills she acquired. The skill to instruct others in the techniques and/or methods

Scholar in exchange

Rudo Musango, Genetic Resources and Biotechnology Institute

has resulted in a written manual, adapted to the circumstances of her home organization.

Planned activities at GRBI after the exchange

In order to facilitate the transfer of modern techniques and methods as well as good laboratory practices for further application at the Zimbabwe National Genebank, the following activities will be performed:

- safety procedures and measures in greenhouse and laboratory
- planting of different plant species for investigations in greenhouse
- germination of different plant species for investigations in greenhouse
- harvesting of young leaves
- DNA extraction from leaves
- storage and identification of samples
- determination of DNA concentration by Nanodrop spectrophotometer
- quantification of DNA using 1.2% agarose gel
- DNA dilution
- SSR procedures
- data analyses.

Most important lessons learned

In her concluding evaluation, Mrs Musango stated:

- “I have now developed confidence in what I do. The exchange programme has taught me to plan and set targets as to when to accomplish the tasks. It has taught me to work independently but seek consultations and advice from others where I lacked understanding either of the process or the outcome of the results.”
- “It has given me an opportunity to be extra careful and concentrate on my work to produce good results.”
- “It has shown me that observation is greatly required in all processes in my work. I had to record and take note of all unusual situations for further investigations.”
- “Accuracy was important from the beginning of the process to the end of it. Shortcuts are not allowed as they lead to inaccurate results which defeat the purpose of the work undertaken.”

• “I now understand the important procedures and that they should be followed in their order of merit till completion.”

• “I have learnt to be efficient and properly timing the prescribed activities.”

- “I have learnt that you have to put in extra time in whatever you do. You have to be dedicated to the work being undertaken.”

“The institute will minimize sending molecular work to private companies, which will decrease expenses for the institute.”

Safety procedures and measures
I plan to spearhead the formation of a safety committee, which will look into safety issues of the molecular lab and administrative issues. I have developed a lab safety manual which must be given to anyone whose interest is to work in the lab. The lab supervisor shall have the responsibility of showing the new person around the lab. Once orientation has been done, the person must acknowledge that he or she has been informed of the safety routines of the lab by signing the register book provided. Signing the register books ensures any future litigation. The signed document must be kept in the file as reference.

Greenhouse

A greenhouse where the accessions can be grown shall be requested mainly for molecular purpose work only. The accessions shall be planted in the greenhouse, constituting a protected environment to avoid insects and pests on plants. This is to avoid contamination of DNA by the insects. The pure DNA shall be acquired from the plants’ young leaves only.

Equipment and chemicals required

I will ensure that the institute acquires the following equipment of importance for running DNA extraction:

- nanodrop spectrophotometer to quantify DNA
- electrophoresis
- electro UV-light camera
- chemicals and DNA kits
- PCR.

The phase after the exchange

The GRBI will benefit greatly from this programme. Mrs Musango has acquired new skills and developed expertise in the area of molecular characterization of germplasm, which is critical to enhance promotion of underutilized Genebank materials by students and researchers.

The skills in molecular work that Mrs Musango has acquired will be taught to colleagues, researchers and students, and shall act as the focal point at the institute. Shortly after her return to the institute she began to supervise a BSc student working on molecular characterization of cow-peas. The challenges of poor dissemination of skills in molecular lab work will not be a recurrent problem again. The GRBI will now be in a position to disseminate all the relevant information on and skills in molecular characterization to university students and researchers. Previously, the GRBI could only assist students and other researchers with morphological work on the crop without carrying out the molecular work in the laboratory. I regard this as an excellent programme. It will greatly improve the research activities to a greater length at my institute that will now have resourceful personnel. Furthermore, the institute will minimize sending molecular work to private companies, which will decrease expenses for the institute.

Suggestions for improving future exchanges

- Students should be allowed to attend short courses at the university and workshops that are related to their exchange programme. This will give them more confidence in what they do.
- The courses make the student do some course work and earn credits in work done.
- Students should be under the mentorship of an experienced lab technician in order to be able to grasp and fine-tune the technicalities of working in the lab. □

Exchange between the Department of Plant Breeding and the Seed Services Institute, Zimbabwe

Activities performed during the exchange September to October 2014

- an assessment of watermelon DNA and primers;
- writing microsatellite PCR protocols for watermelon;
- data analysis and manuscript writing: Elucidating the genetic diversity of farmer cultivars of female date palms from Sudan by microsatellite markers;
- writing a proposal on date palms in Sudan.

Planned activities at the home university after the exchange in order to transfer knowledge/skills learned/trained during the exchange

- support Mrs Rudo Musango and supervise university students and research officers in carrying out molecular studies;
- assist in the administration of the molecular laboratory;
- be a link with SLU in Zimbabwe.

Most important lessons learned

- development of personal networking and collaboration;
- co-authoring of a manuscript;
- development of a proposal in another crop field (Date palm) using skills acquired in the watermelon project;
- the ability to work under pressure and manage the work;
- suggestions of how to improve future exchanges;
- co-supervisors from low-income countries should be allowed to attend short courses and workshops at the university that are related to their exchange programme and pedagogy. This will equip them with new developments in their

Scholar in exchange

Claid Mujaju, The Seed Services Institute

areas of expertise.

- participating co-supervisors should also be given a certificate of recognition, which could stand out as a reference for future networking;
- co-supervisors from a low-income country should be supported by a grant of some kind to be able to acquire certain critical equipment that will for continuity once the exchange programme is over;
- the exchange programme should be continued to allow more researchers from a developing country (Zimbabwe) to acquire laboratory expertise. This will in turn increase the number of skilled people in modern laboratory practices;
- if possible, the training should expose researchers to such courses as Research Designs, Scientific Writing and Data Treatment to fully equip them with knowledge and skills for research design through to publication of the research work;
- the Innovative Doctoral Education for Global Food Security programme initiative is a welcome programme and should be supported to allow transfer of modern technologies. ■

“The Innovative Doctoral Education for Global Food Security programme initiative is a welcome programme and should be supported to allow transfer of modern technologies.”

Training in modern biotechnological techniques

Exchange between the Department of Plant Breeding, SLU and the University of Eldoret, Kenya

Project leader: Anders S. Carlsson



Photo: Anders Carlsson

Rosbella Jemurgor, MSc student from Eldoret University, using a microscope for her cytogenetic's work i.e. to observe chromosomes in a microscope slide.

Pictures on different preparations of nutsedge cell nucleus to determine chromosome numbers.

Objectives

- to perform research work in the area of cytogenetic/ cytotaxonomy / genetics;
- to develop one or more methods for identifying the chromosomal number of the species *Cyperus esculentus* (Yellow nutsedge);
- to produce a method manual adapted to the conditions at the home university to be used in the cytogenetics teaching modules to train the students in this subject;
- to take part in some pedagogical training;
- to support research collaboration between SLU and colleagues at Eldoret, Moi and Rongo universities, Kenya.

Background

Nutsedge has properties that make an introduction of cultivation and use of this crop a contribution to improved food safety. Nutsedge is a robust crop

with high production of nutritious tubers. In contrast to many other tuber or root crops, these have a very long shelf life after harvest and drying. They can be used as planting material for the next harvest even after a long storage period. Ground almonds can be grown on a large scale but also advantageously on a small scale as a supplement for small farmers to use in their own household or sell in the local market.

Results of previous work have shown that some local wild nutsedge varieties in East Africa have the same capacity as cultivated varieties from Europe in terms of yield and nutrient content in tubers. The results also indicate that a large genetic variation exists among the wild nutsedge variants. These results are important because a condition in plant breeding of crops is that there is a large genetic variation in the plant material. The aggregated results show that there is good potential to identify variants that are appropriate to develop

Scholar in exchange

Rosbella Jemurgor, University of Eldoret

into new crop varieties.

There is a clear potential to develop yellow nutsedge into a productive crop in East Africa, which can both help provide rural households' with food security and improve their income when they sell the tubers. However, it will take more research and development to achieve this, since, among other things, it should focus on identifying more promising varieties of ground almonds in East Africa and surrounding regions.

The present exchange was based on the research work on nutsedge that was performed during the recent research collaboration between SLU and colleagues at Eldoret, Moi and Rongo universities in Kenya.

Activities performed during the exchange period dated

During the four months long exchange period the following activities were performed

- chromosome count
- development of training manual
- pedagogical training

Performed/planned activities at the home university after the exchange

To organize:

- one-day training in cytogenetics for the technical staff at the Department of Biological Sciences;
- a dissemination meeting on the manual developed on an optimized protocol of root squash technique to determine chromosome number;
- a dissemination meeting on good pedagogical practices for members of teaching staff at the Department of Biological Sciences.

Most important lessons learned

Rosbella Jemurgor attended a pedagogical course during the exchange and learned a great deal as regards effective teaching that translates to a good teacher, development of a good lesson plan for effective delivery of content, effective communication and the importance of working in teams irrespective of gender and culture. It entails proper planning of delivering content to students by defining attainable intended learning outcomes that should match the learner's activities to boost understanding. Constructive alignment combines

both teaching and assessments tasks to the intended learning outcomes to encourage students to perform learning activities and to assess their performance against the intended learning outcomes and how best to grade them. In conclusion,

what the student does is more important than what the teacher does. The students should just be guided as they search for ideas and this builds their knowledge as they learn.

“The students should just be guided as they search for ideas and this builds their knowledge as they learn.”

Preparing and implementing an exchange visit

An exchange visit requires a well-planned and organized schedule of activities to be done both at the home university and the hosting university to facilitate preparation followed by a clear mode of communication. Ms Jemurgor visited Sweden within the anticipated period though it was months later than planned due to technicalities in acquiring a residence permit.

The phase after the exchange

In the evaluation of the exchange, Ms Jemurgor said, “One of the lessons I have learnt is performing tasks as per the supervisor's instructions and giving timely feedback. In addition, there is need to strictly adhere to the optimized protocol to get the best results. Through consultations I learnt a lot from the experienced expertise.”

Suggestions of how to improve future exchanges

- there is need for timely communication to allow adequate time to process legal documents such as residence permit and passport;
- there is need for the university to acquire their own flow cytometer (analytical instrument of value in determining chromosomal number) to save on resources used for outsourcing services and allow adequate time to conduct experiments;
- to increase the enrolment of exchange students so that they can have international exposure in their field of study;
- there is a need for capacity building at and exposure visits for lecturers to the University of Eldoret to facilitate the learning process. ■

Introducing new methodology in plant ecology

Exchange between Jomo Kenyatta University of Agriculture and Technology, Kenya and the Department of Forest Ecology and Management, SLU

Project leader: Gert Nyberg



Photo: Gert Nyberg

Concepts in the field.

Objectives

To train researchers at Jomo Kenyatta University of Agriculture and Technology (JKUAT) and University of Nairobi (UoN) in using isotopes in ecological and agricultural research.

Background

The Carbon Isotope Analyzer analyses the isotopic composition and amounts of respired CO₂ directly from the soil. This in turn informs on the root activity, i.e. growth, of C₃ (trees) C₄ plants (crops and grasses), respectively. It will hence not only inform on how well plants are growing but also on ameliorative or competitive effects between

C₃ and C₄ plants. In mixed (C₃ and C₄) systems such as agroforestry or agro-silvi-pastoral systems, this is essential information to be able to design improved management systems and thus vital for the production of cereals as well as milk and meat. This method is important as it helps in understanding ameliorative and/or competitive effects between crops/grasses and trees, and is therefore important in understanding and developing management options for improved food production through crops and milk/meat.

This methodology is novel and cutting-edge science; isotopic analyses of respired CO₂ in the field has rarely been done before in Africa and never

Scholar in exchange

Gert Nyberg, SLU



“It did widen my contact net with the partnering universities”

Interview

Gert Nyberg – project leader and scholar on exchange

What are your most important reflections from the project? Practical field training for academic staff, technicians and PhD students from the two partner universities (University of Nairobi and Jomo Kenyatta University of Agriculture and Technology) was very valuable.

Prior cooperation and contacts between all partners made the project run smoothly.

Did you create new networks during the project? It did widen my contact net with the partnering universities, i.e. more and new people involved.

Have any new skill, method, way of thinking or doing things come out of the project? Not per se, but we are to use the instrument (Carbon Dioxide Isotope Analyzer) in new settings and environments on initiatives from partners.

Would you like to share any unexpected experience? Not really. There were unexpected delays, but on the other hand, that can only be expected in projects like this. In the end we fulfilled all the training plans and the instrument is now in Kenya for the use of e.g. the trained partners in their research.

on the scale that is possible with this methodology. It would hence enable Jomo Kenyatta University of Agriculture and Technology (JKUAT) and University of Nairobi (UoN) researchers to participate in top-class science and students to know the latest methodological achievements and possibilities. The use of this instrument in JKUAT/UoN research and education will align well with existing methodologies at JKUAT and UoN in field-based soil respiration studies and add the isotope component to previous work, thereby enabling a deeper system understanding. After this training exchange, the instrument will partly be based at JKUAT and UoN.

Activities performed during the exchange period

During the two months long exchange period the following activities were performed:

- theoretical background seminars on *Isotopes in ecological and agricultural research*;
- seminar on data management and interpretation;
- set-up and demonstration of a Carbon Dioxide Isotope Analyzer at the JKUAT demonstration/experimental farm on campus, Vi-Agroforestry sites in Kitale, small-scale agroforestry farms (collaborative research project sites) and West Pokot;
- field application and training of scientists and technicians from JKUAT and UoN in the field on the same instrument;

- writing of field manual for operating the instrument.

Most important lessons learned

Hands-on practical field experience of operating the instrument proved to be very valuable. Kenyan colleagues appreciated both the technical experience and gained an understanding of the ecological research issues that can be addressed with this technology.

The project would not have been possible without previous contacts and research cooperation.

We look forward to continued personal and institutional research cooperation and to joint scientific publishing.

Suggestions for improving future exchanges

Time planning should have been more detailed before the exchange took place. Financial administration could have been faster at both ends, as it now slowed down work. ■

AGRIFOSE writeshop

Project leader: Helena Eklund-Snäll

Background

In 2012 SLU took the initiative to coordinate an application to the EU-funded Erasmus Mundus Action 2-programme, which aims at “...enhancing academic cooperation and exchanges of students and academics, contributing to the socio-economic development of non-EU countries...” (European Commission’s Education, Audiovisual and Culture Executive Agency). Partners from four European universities and 14 universities in Africa, the Caribbean and the Pacific (ACP) were invited to form a consortium, “The Agricultural Sciences Network for Food Security” (AGRIFOSE), which developed and submitted a joint proposal to the Erasmus Mundus Action 2-programme in 2012. The concrete objective of the proposal was to obtain funding for 157 mobilities (persons) during a total of 1,685 months from mainly ACP countries to the five EU universities. The proposal received positive evaluations but the project was nevertheless put on the reserve list. Encouraged by the positive evaluations and the well-functioning collaboration with its partners, SLU decided to reapply in 2013. In order to improve the application according to the evaluators’ comments and in particular on issues relating to student mobility flows and practical arrangements for incoming students, SLU decided to invite some key partners to a writeshop.

Aim

The aim of the AGRIFOSE project was to create a sustainable international and multiregional partnership for academic exchange between selected ACP and EU countries in the food security field – i.e. to bridge existing capacity gaps by creating a forum for exchange of experiences and best practices between experienced and less experienced higher education institutions (HEIs). Under the joint coordination by the Swedish University of Agricultural Sciences and Makerere University in Uganda, AGRIFOSE brought together 19 HEIs with extensive education and research activities in the agricultural sciences in Europe (Austria, Denmark, Finland, France and Sweden) and the ACP region (Benin, Burkina Faso, Cameroon, Ethiopia, Ghana, Haiti, Ivory Coast, Kenya, Madagascar, Malawi, Rwanda, Samoa/Fiji, Tanzania and Uganda). The overarching intention was to establish a core consortium, where a few strong HEIs in the ACP (and the EU) would function as regional hubs supporting weaker and/or new universities in the vicinity. For this reason, a few African HEIs with limited human resources and



Participants in the AGRIFOSE writeshop at SLU, Uppsala, Sweden

little experience of international collaboration, and which are located in areas where access to higher education is a challenge or in newly created countries, were included among the 12 associated partners. The other associate partners were partnership-based African organisations in the agricultural field that work throughout the African continent and Africa-based research organisations which are also potential employers.

The AGRIFOSE writeshop was held from 19–21 March 2013 at SLU’s Uppsala campus. In order to have a creative and effective environment, and specialist knowledge about the main issues to be discussed, the workshop participants were restricted to one representative for each European partner and the co-coordinating university in Uganda. All partners were informed about the main topics and invited to provide input before, during and after the workshop.

A revised application was submitted and received positive comments and scoring from the evaluators. Nevertheless, the project was again put on the reserve list. There have, unfortunately, been no more opportunities to apply since the Erasmus Mundus programme was phased out when the activities within the Life Long Learning Programme were transferred to the new Erasmus+ programme on 1 January 2014. A lasting outcome of the effort is nevertheless a strong network of contacts between a large number of HEIs, research institutes and organisations in the field of agriculture and food security in many countries in Europe and the ACP region.

Main workshop participants:

Denis Mpairwe, Makerere University, Uganda
Jean Luc Bosio, Montpellier SupAgro, France
Nina Himberg, Helsingfors universitet, Finland
Helena Eklund Snäll, SLU, *Malin Larsson*, SLU. ■



Summary

Summary

For three consecutive years, 2010 – 2012, the Swedish University of Agricultural Sciences (SLU) received funding from the Swedish Ministry for Foreign Affairs (UD) out of its specific allocation for long-term strengthening of global food security through capacity development of research and higher education in agricultural and environmental sciences. The program was organized and administered through the SLU programme Agricultural Sciences for Global Development – SLU Global. This report presents results from the Innovative Doctoral Education for Global Food Security scheme, which was run during 2013 and 2014 and which constitutes the concluding part of SLU's actual UD funding.

In order to develop capacity and internationalisation of doctoral education together with partner universities in Eastern Africa, 530 doctoral students and senior staff including, teachers, supervisors, librarians, directors and deans participated in 25 projects in the Innovative Doctoral Education for Global Food Security programme. The activities were carried out jointly by SLU and teachers/facilitators from partner universities and organizations in East Africa. Further, 20 people went on so-called teacher exchanges, most of them for 2–3 months, in order to transfer teaching and research approached quality assurance routines and good supervision practices.

By jointly planning and conducting the courses and workshops, the facilitators learned about each other's pedagogical values and practices as well as quality assurance standards. The cooperation resulted in curricula adapted to both the local and international context. Finally, different traditions of teacher-student relationships connecting to different aims, structures and interpretations of evaluations and examinations lived side-by-side during the activities.

All activities had participants from different disciplines and were aimed at using the extra value of transdisciplinarity by both facilitators and participants.

All activities had participants from several different countries and the internationalisation was thus a constantly present dimension supporting the development of the attitudes, skills and competences (including language and intercultural skills) needed to live and work in a globalised world. In the teaching and learning courses and workshops, time was taken to reflect on what you can do as a teacher to support the internationalisation process in the higher education.

Support from the university library and pedagogical development units are of paramount importance for research and education at all universities. During this particular programme, training in information retrieval, scholarly communication and teaching and learning skills was conducted jointly by facilitators from Makerere University and SLU. This cooperation supported capacity development at the university library and pedagogical development units at both universities as well as the participants' skills.

Universities all over the world have a strong tradition of recruiting their leaders from their academic staff. For this reason, academic leaders are normally experienced teachers and leaders of scientific research teams. However, academic management, governance and leadership today also require different kinds of insights and overviews to be able to lead development of the universities' capacity to handle massification of education and to cope with the international competition for talented students and researchers. At the workshops organised by the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE) and the Tertiary Education for Agriculture Mechanism (TE-AM-Africa), respectively, 95 institutional leaders from many of the Sub-Saharan countries reflected, analysed and drew conclusions about common development alternatives and how to proceed.

The capacity and reliability of Internet connections are steadily improving also in SLU's African partner universities. Networks created by doctoral students, young researchers and academic leaders in the area of global food security therefore use smartphone apps and web platforms for their continued communication. Since training of doctoral supervisors is a cornerstone of quality doctoral education SLU began the development of a web portal for pedagogical support to doctoral students and supervisors. With the help of the portal all those who have participated in the Innovative Doctoral Education for Global Food Security programme will have a platform for continued development of the doctoral education.



Appendix



Appendix 1: Programme summary statistics

Budget: 20 000 000 SEK

Number of projects 25

Collaborations

Number of countries 28

Number of academic institutions 20

Number of organisations 14

Capacity-building activities

Number of courses and workshops 25

Number of teachers and facilitators performing courses and workshops 104

Number of participants in courses and workshops 530

Number of scholar exchanges 20

Appendix 2: Collaborations

Organisations

Christian Aid
 Genetic Resources and Biotechnology Institute (GRBI)
 Seed Service Institute
 AISEF
 ANAFE
 CIFOR
 FARA
 Green Belt Movement
 International Livestock Research Institute (ILRI)
 NEPAD
 TEAM Africa
 the EU-Africa Doctoral Student Network (DocLinks)
 The International Centre for Research in Agroforestry (ICRAF)
 USAID

Universities

University of Botswana
 Institute of Fishing at Mbandaka
 University of Kinshasa
 Addis Ababa University
 Mekelle University
 Wondo Genet College of Forestry and Natural Resources
 Helsingfors universitet
 Montpellier SupAgro
 Embu University College
 Jomo Kenyatta University
 Kenyatta University
 University of Eldoret
 Nairobi University
 Universidade Eduardo Mondlane (UEM)
 School of Agriculture, University of Portugal
 University of Rwanda
 Nelson Mandela Institute of Science and Technology
 Sokoine University of Agriculture (SUA)
 Makerere University
 University of Zambia (UNZA)

Countries

Democratic Republic of the Congo
 Zimbabwe
 Zimbabwe

Botswana
 Democratic Republic of the Congo
 Democratic Republic of the Congo
 Ethiopia
 Ethiopia
 Ethiopia
 Finland
 France
 Kenya
 Kenya
 Kenya
 Kenya
 Kenya
 Mozambique
 Portugal
 Rwanda
 Tanzania
 Tanzania
 Uganda
 Zambia

Appendix 2: Collaborations, *continued*

Departments at SLU

Department of Animal Nutrition and Management
Department of Aquatic Science and Assessment
Department of Chemistry and Biotechnology
Department of Clinical Sciences
Department of Ecology
Department of Forest Ecology and Management
Department of Forest Resource Management
Department of Plant Biology
Department of Plant Breeding
Department of Plant Protection Biology
Department of Urban and Rural Development

Divisions at SLU

Agricultural Sciences for Global Development (SLU Global)
Division of Educational Affairs
Division of Planning
SLU Library

Appendix 3: Summary statistics for individual projects

Chapter in the report	Projects	Budget	Number of participants	Number of teachers/facilitators	Reference to the application	
1. New knowledge and methods for achieving global food security – joint higher education between SLU and six east African universities	1.1 Global challenges in food security – theory and methods	800 000	17	5	Insats 1: Fördjupat samarbete med afrikanska universitet/ 2 Doktorandkurser	
	1.2 Integrated pest management and food security in the tropics	880 000	29	19		
	1.3 Plant-microbe interactions – exploring microbes to improve crop productivity	800 000	19	12		
	1.4 Restoration of degraded semi-arid landscapes – livelihoods, livestock and land use together with Jomo Kenyatta University; ICRAF; ILRI	880 000	20	16		
	1.5 Global challenges – urbanization, livelihoods and food security	880 000	22	4		
	1.6 Global development, natural resources and livelihoods – a field course for master students	260 000	16	10		
2. Innovative doctoral education – training of transferable skills to build for tomorrow's research quality together with Makerere University	2.1 Transferable skills training Segment 1: Teaching and learning in higher education for doctoral students	2 175 000		54	Insats 1: Fördjupat samarbete med afrikanska universitet 2. Doktorandkurser samt insats 2 workshops i biblioteks- och informationskunskap; administration och ledarskap respektive pedagogik	
	Improving and internationalizing university courses – a workshop for senior lecturers			52		
	2.2 Transferable skills training Segment 2: Scientific approach and ethics for doctoral students	1 975 000		54		7
	Scientific approach and ethics – a workshop for supervisors of			15		
	2.3 Transferable skills training Segment 3 : Information literacy and scholarly communication for doctoral	1 975 000		54		13
	Open access and scholarly communication: local and global perspectives – a workshop for senior staff			51		
3. Agri-food sector in rapid change requires reforms of institutional management, governance and leadership of higher agri-education	3.1 Regional training workshop on governance and management in tertiary agricultural education organized by ANAFE	512 000	35	5	Insats 2: medverkan i TEAM Africa och Insats 3: samarbete med ANAFE om workshops i administration och ledarskap respektive pedagogik	
	3.2 Improving tertiary agricultural education leadership in Africa – a training tool for African academic leaders to bring relevant issues into their programs	590 000	69	3		
	3.3 Training doctoral supervisors: - a cornerstone of quality doctoral education	600 000	38	1		
	3.4 Educational management development at University of Rwanda – workshop for educational leaders	200 000	25	3		
4. Mobility – transfer of skills in modern techniques and methods, best practice and quality assurance routines through teacher exchange	4.1 Advanced education in aquatic sciences and assessment	545 000	3		Insats 1: Fördjupat samarbete med afrikanska universitet 1. Lärarutbyte	
	4.2 Advanced education in agroforestry and soil management	69 100	1			
	4.3 Training in modern techniques in soil ecology	100 800	1			
	4.4 Introducing interdisciplinary research methods and a scenario modelling tool	299 000	37			
	4.5 Development of interdisciplinary approaches and practices in education and research	149 170	1			
	4.6 Training modern technologies, research methods and contemporary approaches to rural extension	123 800	1			
	4.7 Learning about implications of interdisciplinary approaches and practices in education and research	110 200	1			
	4.8 Training in epidemiology and disease control	115 000	1			
	4.9 Training in modern biotechnological techniques and good laboratory practices	350 000	2			
	4.10 Training in modern biotechnological techniques	390 000	1			
	4.11 Introducing new methodology in plant ecology	309 700	11			
	4.12 AGRIFOSE writeshop	350 000	10			

The UD20¹ Blues

Written by Nicolette Karst, as a reflection on the a planning workshop within the UD20-project

18 October 2013



Nicolette Karst performing the UD20 Blues assisted by George Nasinyama.

Once there was a project
With a long and difficult name
But we call it UD20, no worry,
The content is still the same
It's all about some countries
Working towards one goal: to get
Their staff and PhD-students
Learning as a whole
By developing some courses
And adding some workshops, too

The structure of the project
Takes some time to explain
But if you listen carefully
I won't have to take it again
It really is quite simple:
The project has three parts
And if we make it work, well,
Success is in the charts
We'll develop all these courses
And add some workshops, too

So the first part: some courses
In transferable skills
'Cause information retrieval
And ethics are the thrills
Part two are other courses

The thematic-subject-ones
Taught in cooperation
Based on research being done
We'll develop these courses together
And add some workshops, too

Now we've come to the third part:
The teaching staff exchange
It's work combined with pleasure
Although that might sound strange
Modern techniques and research methods
Is what we're talking here
And then we'll instruct our colleagues
In those same skills, as peers
We'll develop all these courses
And add some workshops, too

There is a hefty time plan
Prone to induce stress, 'cause
We'll have to get those courses goin'
And those workshops in no less than
Two years filled with working,
Blood and sweat and tears
But it will all be worth it
'Cause the product that appears
Are all these beautiful courses
And some workshops, too
And this, my dearest friends,
Was the UD20 Blues .

¹UD20 refers to the internal SLU name of the programme Innovative Doctoral Education for Global Food Security 2013-2014.



Innovative Doctoral Education for Global Food Security 2013-2014 – a Swedish Government Initiative

Since 2009, the Swedish government, through the Ministry for Foreign Affairs (UD), has made specific investments in programmes aimed at supporting long-term food security with an emphasis on sub-Saharan Africa. Here we report results from the third, and final, UD allocation that SLU received in 2012 to be used during the years 2013 and 2014 with a focus on teaching and postgraduate training in collaboration with African partner universities. Graduate students are pivotal from a socio-strategic perspective as they will be future leaders, not only in academia but in many sectors of society. A progressive and dynamic educational system will thus have long-term impact on economic and community advancement apart from its more obvious influence on scientific progress. To this end SLU initiated the programme Innovative Doctoral Education for Global Food Security in order to contribute to capacity development of higher education and doctoral studies related to agricultural and environmental sciences.

By participating in advanced courses organised within the framework of this programme, doctoral students have been introduced to interdisciplinary research, international networking and training in transferable skills. As these courses were international, both by format, location and backgrounds of facilitators and participants, they have provided excellent conditions for networking. The joint endeavor, by facilitators from the African partner universities and SLU, to develop courses and workshops has contributed to develop the capacity in pedagogy and educational management.

The workshops have developed the capacity of teachers and supervisors to operate in interdisciplinary contexts; to teach and supervise and utilize up-to-date methods and techniques of research communication and publishing. Institutional capacity of governance and management was supported by a number of leadership workshops. Finally, transfer of modern teaching and research approaches, quality assurance routines and good supervision practice was supported by exchange of scholars between the African partner universities and SLU.

The 25 main activities within the programme have had a geographical focus on eastern and southern Africa and have involved Swedish and African universities as well as around 30 African universities and international organisations. In total 530 doctoral students, senior staff participated in courses and workshops. The exchange programme included 20 scholars.

The **Swedish University of Agricultural Sciences (SLU)** has core competence within the agricultural sciences, including forestry and veterinary sciences. The university's areas of expertise cover urgent global issues such as food production, energy supply, climate change, biodiversity conservation and control of infectious diseases in animal and man.

To strengthen SLU's involvement in issues related to improving productivity in agriculture, food security and sustainable livelihood in low-income countries, the university has established the programme **Agricultural Sciences for Global Development, (SLU Global)**. The programme's mission is to coordinate and visualize SLU's competence in research, education and expert counselling within the framework of the Swedish Policy for Global Development.

www.slu.se/slu-global

