

Assessment of Needs for Training, Collaborative Research, and Institutional Capacity-Building for Agricultural Development and Food Security In Tanzania

by

Eric Crawford, Kathleen Colverson, Russell Freed, Steven Haggblade, and Isaac Minde

With Contributions from the Needs Assessment Task Force:

John Banzi, Justa Katunzi, Gungu Mibavu, and Apenda Mrinji from Ministry of Agriculture, Food Security and Cooperatives, and Amon Mattee, Elibariki Msuya, Susan Nchimbi-Msolla, and Hezron Sanga from Sokoine University of Agriculture

An iAGRI Project Report

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Abbreviations

AoE	Area of Expertise
AOTR	Agreement Officer Technical Representative
CCIM	Climate Change Impact and Mitigation
COSTECH	Tanzania Commission for Science and Technology
CSP	Corporate Strategic Plan
DRD	Directorate of Research and Development
DVC	Deputy Vice Chancellor
EPINAV	Enhancing Pro-poor Innovation in Natural Resources and Agricultural Value Chains
FTF	Feed the Future program
GPIC	Gender Policy Integration Committee
iAGRI	Innovative Agricultural Research Initiative
ICE	Institute of Continuing Education
ICT	Information and Communications Technology
INTSORMIL	Sorghum and Millet and Other Grains Collaborative Research Program
IO	Input Output
IPM	Integrated Pest Management
ISU	Iowa State University
IT	Information Technology
LSMS	Living Standards Monitoring Survey
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MATI	Ministry of Agriculture Training Center
MBA	Masters of Business Administration
MSU	Michigan State University
NARS	National Agricultural Research System
NBS	National Bureau of Statistics
NCT	National College of Tourism
NGO	Non-governmental Organization
NORAD	Norwegian Agency for Development Cooperation
OSU	The Ohio State University
SAM	Social Accounting Matrix
SMC	Solomon Mahlangu Campus
SUA	Sokoine University of Agriculture
TAHA	Tanzania Horticultural Association
TARO	Tanzania Agricultural Research Organization
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TEEAL	The Essential Electronic Agricultural Library
TMB	Tanzania Meat Board
TU	Tuskegee University
UF	University of Florida
USAID	U.S. Agency for International Development
VC	Vice Chancellor
VETA	Vocational Education and Training Authority
VT	Virginia Tech
WID	Women in Development

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Executive Summary

The Innovative Agricultural Research Initiative (iAGRI) aims to strengthen the training and collaborative research capacities of Sokoine University of Agriculture (SUA) and the Tanzanian National Agricultural Research System (NARS). iAGRI is funded by USAID/Tanzania as part of its Feed the Future (FTF) program. The goal of iAGRI is to improve food security and agricultural productivity in Tanzania through activities including training at M.Sc. and Ph.D. levels, collaborative research among SUA, the National Agricultural Research System (NARS) within the Ministry of Agriculture, Food Security and Cooperatives (MAFC), and the private sector, strengthening of institutional capacity for SUA in priority areas, and cooperation between SUA, USA universities and global south universities.

The Needs Assessment (NA) is an essential and important start-up activity for the iAGRI Project. The general objective is to (i) Establish the current situation of MAFC and SUA in terms of training of staff and agricultural research, (ii) Establish where they would like to be in the future, (iii) Assess the gaps between the current situation and the desired future situation, and (iv) Prioritize the gaps in order to guide future iAGRI project interventions given resource limitations. The results of the NA will be reviewed and discussed at a workshop for key stakeholders to be held in mid-October, to arrive at a consensus on the gap analysis and to identify priority areas for future investment.

A variety of methods were used in this study. They include but were not limited to (i) Review of literature; (ii) Statistical analysis to determine growth rates in the food industry and future demand for skills in the food system by the private sector and public institutions, in order to inform the needs for short- and long-term training; and (iii) key stakeholder consultations at SUA, MAFC, quasi-public institutions, and private sector, in areas such as production, processing, packaging, transportation logistics, financing and policy. At SUA, significant effort was devoted to understanding the evolution of student enrollments at SUA and its implications for adequacy of available facilities.

Data, information and analyses were sought in the following main areas: (i) sectors and commodities that will expand most rapidly in the food system and their corresponding skill requirements; (ii) current and future long-term training needs for both SUA and MAFC; (iii) gender issues in the two institutions, specifically how gender awareness can be integrated into training,

¹ John Banzi, MAFC; Justa Katunzi, MAFC; Gungu Mibavu, MAFC; Apenda Mrinji, MAFC; Amon Mattee, SUA; Elibariki Msuya, SUA; Susan Nchimbi-Msolla, SUA; Hezron Sanga, SUA.

collaborative research, and how greater gender equality and equity can be realized in both institutions; and (iv) collaborative research areas taking into account existing efforts and future directions as seen in the available strategic plans for the two institutions—MAFC and SUA.

The profile of existing agricultural research programs and projects in the two institutions was examined. Future collaborative research will have to take account of ongoing work and learn and adapt best practices from completed research projects. The aim is to avoid false starts and to maximize efficiency and relevancy in future collaborative research.

Assessment of institutional capacity-building at SUA covered training and exchange of academic staff, and specific issues affecting female faculty and non-academic staff members. Other areas important for nurturing training and collaborative research included water and electricity supply, library facilities and the ICT support system, and revival of the Institute of Continuing Education as well as engagement of SUA in agricultural extension.

The last section of this report lays out a general priority-setting framework suggested for use in the priority-setting workshop scheduled for 17-18 October 2011. This framework will enable key project stakeholder participants to prioritize, first, among major components such as training, collaborative research, and institutional strengthening, and then to prioritize among sub-components. These priorities will guide the Project Management Unit in designing and implementing the program of work for iAGRI over the remaining four-and-a-half years of the Project, subject to any necessary mid-course revisions.

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1. Introduction

The Innovative Agricultural Research Initiative (iAGRI) aims to strengthen the training and collaborative research capacities of Sokoine University of Agriculture (SUA) and the Tanzanian National Agricultural Research System (NARS). iAGRI is funded by USAID/Tanzania as part of its Feed the Future (FTF) program. The goal of iAGRI is to improve food security and agricultural productivity in Tanzania, through activities that address the following objectives:

- To provide degree training in agriculture for 120 Tanzanian graduate students, including 100 at the M.S. level and 20 at the Ph.D. level;
- To strengthen the capacity of SUA to develop and implement instructional, internship, and outreach programs in agriculture;
- To establish a program of collaborative agriculture research with SUA and NARS; and
- To promote cooperation between SUA, U.S. universities, and global south universities.

iAGRI is a partnership of Tanzanian institutions, principally SUA and the Ministry of Agriculture, Food Security and Cooperatives (MAFC), and a group of six U.S. land grant universities, including The Ohio State University (OSU) as the lead institution, Michigan State University (MSU), University of Florida (UF), Virginia Tech (VT), Tuskegee University (TU), and Iowa State University (ISU). iAGRI was launched in March 2011 as a five-year project. After selecting an initial cohort of seven students to begin graduate study at the U.S. partner universities in August 2011, the next major activity of iAGRI was to conduct a joint assessment of the needs for long-term training and institutional capacity strengthening, and to identify priorities for collaborative research by SUA and the NARS.

2. Needs Assessment Approach

Given the objectives of iAGRI, the priorities of USAID/Tanzania, and the available budget for Year 1,³ it was decided to focus the needs assessment on the following:

- The Faculty of Agriculture, within SUA;
- The NARS, within the Ministry of Agriculture, Food Security and Cooperatives;

² John Banzi, MAFC; Justa Katunzi, MAFC; Gungu Mibavu, MAFC; Apenda Mrinji, MAFC; Amon Mattee, SUA; Elibariki Msuya, SUA; Susan Nchimbi-Msolla, SUA; Hezron Sanga, SUA.

³ At the inception of iAGRI in March 2011, the intended project budget of \$24 million was reduced to \$15.5 million. Funds received for Year 1 activities amounted to \$2.5 million.

- Links between SUA and the NARS, on the one hand, and the private sector and agricultural extension service, on the other hand; and
- Consistency with priorities embodied in USAID's FTF program, including gender as a cross-cutting issue; rice, maize, and horticulture as key commodities; and Morogoro and Arusha regions as a geographical focus.

MSU was charged with implementing the needs assessment, with leadership from the iAGRI in-country Project Management Unit. The following needs assessment team was assembled:

- Isaac Minde, Deputy Project Director and needs assessment team leader,⁴ based in Morogoro
- Eric Crawford, Professor, Department of Agricultural, Food, and Resource Economics, MSU
- Kathleen Colverson, Associate Director, Program Development, International Center, UF
- Russell Freed, Professor, Department of Crop and Soil Sciences, MSU
- Steven Haggblade, Professor, International Development, Department of Agricultural, Food, and Resource Economics, MSU

As of late August, the following members of the in-country task force joined the needs assessment team:

- John Banzi, MAFC, Research and Development
- Justa Katunzi, MAFC, Crop Development—Extension
- Gungu Mibavu, MAFC, Policy and Planning
- Apenda Mrinji, MAFC, Training
- Amon Mattee, SUA, Dept. of Agricultural Education and Extension
- Elibariki Msuya, SUA, Dept. of Agricultural Economics and Agribusiness
- Susan Nchimbi-Msolla, SUA, Deputy Director of Research and Publications
- Hezron Sanga, SUA, Principal Planning Officer

The needs assessment proceeded in two main phases. The first was to carry out an analysis of expected trends in Tanzania's food system, as background for determining future growth areas and job skill needs. The second was to field a team in Tanzania to carry out an assessment of current capacity for the NARS and the Faculty of Agriculture at SUA, as the basis for determining gaps in current capacity relative to anticipated needs, which would suggest priorities for iAGRI project activities. In the process of carrying out this task, the Team took note of three major engagements of SUA in the last six years aimed at improving the management of its academic and administrative operations. These engagements are (i) the Corporate Strategic Plan (CSP) 2011-2015 (which is the third in the series); (ii) Tracer studies carried out in 2005-06 that have led to the launching of new degree programs and review of curricula; (iii) Restructuring the management system and organizational structure, which started in 2007 and is now close to being endorsed. It is expected that when the latter is approved for implementation, it will be folded into the current CSP. iAGRI, though not expected to be the vehicle for implementing SUA's CSP in its entirety, recognizes the intentions of the implementation plan of 3rd CSP, and seeks to support and facilitate and not to contradict the laid out implementation plans. On the part of MAFC, the recent Zonal Agricultural

⁴ Dr. Minde is also Professor, International Development, Dept. of Ag., Food, and Resource Economics, MSU.

Research Priorities have provided some indication of potential direction for collaborative research areas.

The first phase of the Needs Assessment (“futuring” analysis) was conducted from July to mid-August. The second phase was conducted in Tanzania from mid-August through mid-September. Annex A contains the scope of work for the needs assessment. Annex B contains the team’s calendar of activities in Tanzania, and list of persons contacted.

3. Analysis of Food System Dynamics in Tanzania⁵

3.1 Objectives of Analysis

Tanzania’s food consumption patterns will change dramatically over the coming decades. Rising urbanization and growing per capita incomes will double the marketed volumes of foodstuffs every 12 to 14 years and ramp up demand for high-value foods (dairy, meat and fresh fruits and vegetables), processed foods, packaged convenience foods, and prepared foods. Growing demand for packaged convenience foods will require substantial private sector investment in food-processing technology. As an increasingly commercial agriculture develops to meet this growing market demand, farm input demand for improved seeds, fertilizer, herbicides, feeds and veterinary services will expand rapidly. Fueling the necessary productivity increases in this growing and modernizing food system will require a steady flow of trained scientific and technical skills in support of farm production, feed industries, storage, supply chain management and food-processing industries. Public investments and regulatory structures will also be needed to support innovation and agribusiness growth.

As a result, Tanzania’s rapidly changing food markets will demand increasing numbers of trained personnel as well as a shifting mix of technical skills to staff private sector food industries and public support institutions. The following forward-looking projections explore key trends affecting the demand for skilled manpower in Tanzanian agriculture and agribusiness over the coming decades. (See Annex L for technical details on the analysis presented in section 3.)

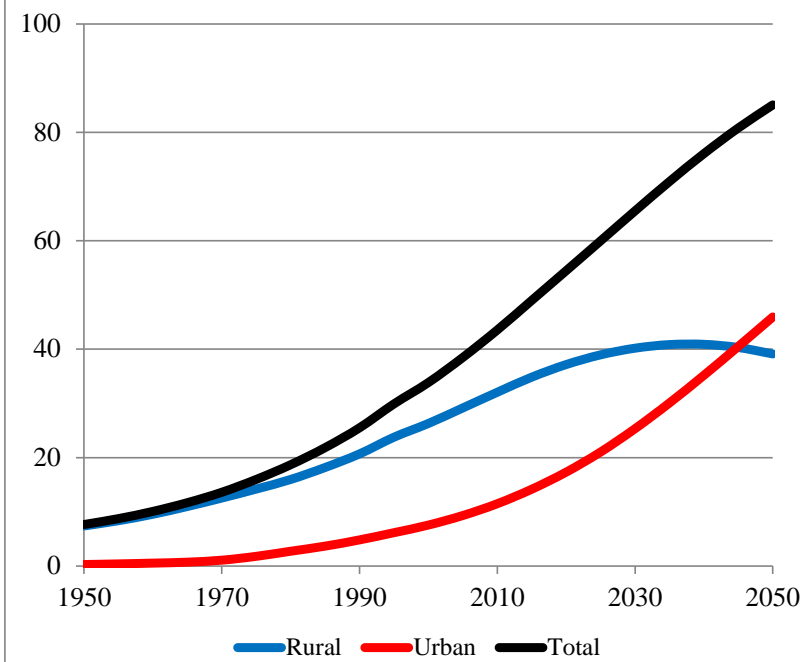
3.1 Demographic Dynamics

Rural areas currently house 75% of Tanzania’s population. However, over the next 40 years, Tanzania’s urban population is projected to grow rapidly (at 3.5% per year), from 11 million in 2010 to 46 million in 2050. In contrast, the rural population will grow at only about 0.5% per year. By 2050, a majority of Tanzanians will live in urban areas (Figure 1).

Half of Tanzania’s urban population resides in small towns of under 250,000. These small urban centers are growing as fast as large cities, leading to a proliferation of population in small urban towns (GRUMP 2010). Tanzania’s rural population clusters in several high-density rural areas, particularly in the Great Lakes region and in the central and southern highlands (Figure 2). Geographically, small urban centers are most likely to expand in these zones.

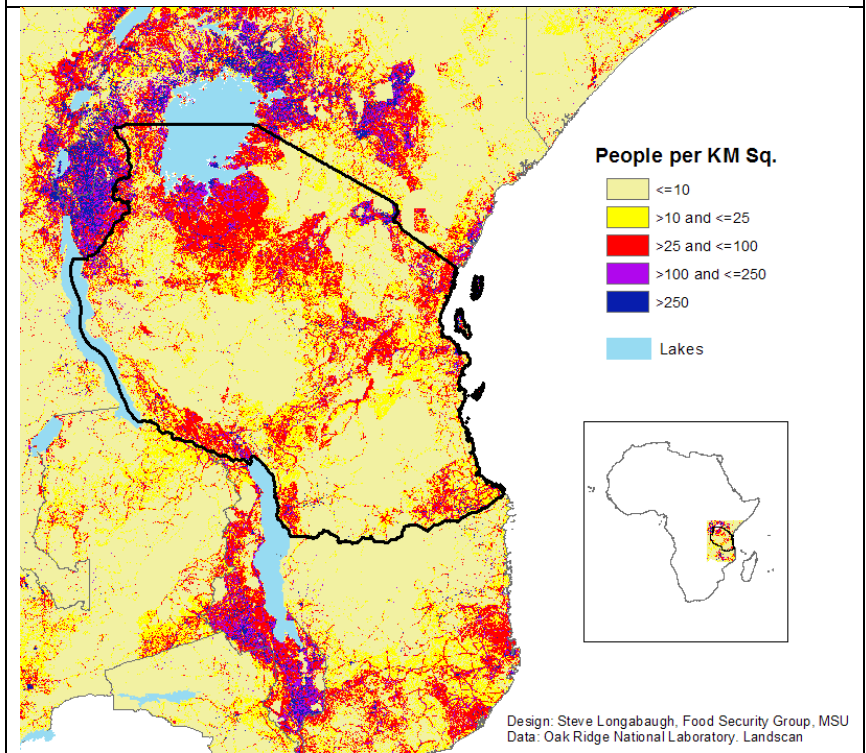
⁵ Excerpts from Dolislager, Haggblade, and Tschirley (2011).

Figure 1. Rural and Urban Population Trends in Tanzania, 1950 to 2050 (millions of people)



Source: United Nations (2007)

Figure 2. Population Density in Tanzania and Environs



Source: Oakridge National Laboratory (2007).

3.2 Food System Dynamics

3.2.1 Growing marketed shares

As a result of rapid urbanization, the marketed share of Tanzanian food consumption will grow far faster than total population over the coming decades. While national population will double between 2010 and 2050, the value of marketed food will increase by a factor of six (Table 1).

Table 1. Value of Marketed Food in Tanzania (\$ billion/year)

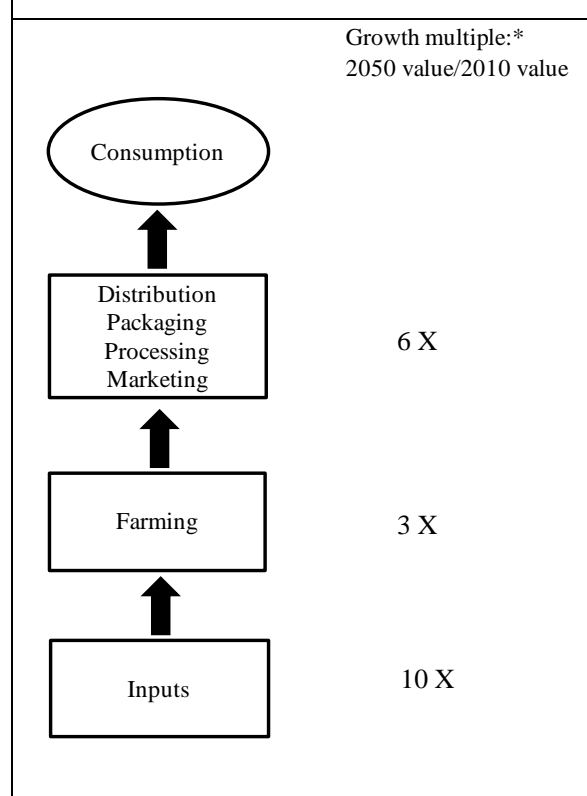
	2000	2010	2020	2030	2040	2050
Marketed foods						
Rural	10	15	23	32	41	50
Urban	8	16	28	49	80	124
Subtotal	18	31	51	81	121	174
Nonmarketed foods						
Rural	8	10	13	14	14	13
Total	26	42	64	95	136	187

Source: Projections based on LSMS (2008).

3.2.2 Agroprocessing and farm input markets

Under most plausible future scenarios, Tanzania's food processing and distribution industries will grow far faster than farm production. With greater urbanization, rising incomes and changing tastes, demand for processed and prepared foods will likely increase rapidly. Moreover, the increasingly commercial farms emerging to supply these expanding markets will require improved quality control, better management and more and improved inputs, including seeds, fertilizer, herbicides, fungicides, artificial insemination and veterinary services. As a result, markets for farm inputs and services are likely to expand rapidly. Though starting from a small base, a range of projections suggest farm input demand (for seeds, fertilizer, herbicides, pesticides, feeds and veterinary services) is likely to grow by a factor of ten (Figure 3). While the value added from food production on-farm will need to triple over the next 40 years to match Tanzania's doubling population and changing tastes, growth in marketed volumes will increase twice as fast, by a factor of six (Figure 3).

Figure 3. Projected Growth in Tanzania's Food Systems, 2010 to 2050



3.2.3 Commodity projections

Table 2. Projected Growth in Food Consumption in Tanzania, 2010 to 2050

Food	Value Consumed 2010 (\$ billion/year)			Value Consumed 2050 (\$ billion/year)			Increase 2010 to 2050	
	rural	urban	national	rural	urban	national	\$ billion	rate/year
Prepared foods consumed away from home	1.7	4.0	5.7	4.9	41.7	46.6	40.9	5.4%
Alcoholic beverages	0.8	0.5	1.3	2.3	10.1	12.4	11.1	5.8%
Non-alcoholic beverages	0.5	1.2	1.7	2.0	14.5	16.5	14.8	5.9%
Eggs	0.2	0.2	0.3	0.3	2.0	2.4	2.1	5.1%
Beef	0.8	0.9	1.8	2.6	8.0	10.6	8.8	4.6%
Meat, other than poultry and beef	0.7	0.2	0.9	3.2	2.0	5.2	4.2	4.4%
Poultry	0.9	0.3	1.2	2.7	3.2	5.9	4.7	4.0%
Wheat products	0.8	0.7	1.5	3.2	3.7	6.8	5.4	3.9%
Plaintains	1.4	0.2	1.6	5.5	1.0	6.5	4.9	3.5%
Fruits	0.7	0.4	1.1	1.9	2.5	4.4	3.3	3.5%
Milk and dairy products	0.8	0.3	1.2	2.1	2.5	4.6	3.4	3.5%
Rice	2.1	1.4	3.5	6.2	6.6	12.8	9.3	3.3%
Oilcrops and vegetable oils	0.7	0.5	1.2	1.6	2.6	4.2	3.1	3.3%
Fish	1.3	0.7	2.0	3.2	4.0	7.2	5.2	3.2%
Sugar and sweets	1.0	0.7	1.7	2.6	3.1	5.8	4.1	3.2%
Vegetables	1.6	1.0	2.6	2.8	5.8	8.6	6.0	3.1%
Yams, potatoes, other roots and tubers	1.0	0.3	1.3	2.0	1.7	3.7	2.4	2.7%
Other foods (spices, tree nuts, etc.)	0.7	0.4	1.1	1.6	1.5	3.0	1.9	2.5%
Pulses	1.9	0.5	2.4	3.7	2.3	6.0	3.6	2.3%
Sorghum and millet	0.5	0.1	0.7	1.0	0.6	1.7	1.0	2.3%
Maize and maize products	4.6	1.2	5.8	6.9	3.8	10.6	4.8	1.5%
Cassava	1.0	0.2	1.2	1.2	0.5	1.7	0.5	0.9%
Total	25.6	16.1	41.7	63.5	123.6	187.1	145.4	3.8%

Source: Projections based on LSMS (2008).

Forward-looking projections⁶ of food consumption in Tanzania suggest four broad conclusions:

- Prepared foods dominate current food expenditure as well as future growth. High urban expenditure elasticities coupled with a rapid increase in urban population suggest annual growth of over 5% per year, leading to a 25% food market share by 2050 (Table 2).
- Beverages, both alcoholic and non-alcoholic, will grow even faster, at nearly 6% per year. At that rate, together they will attain a 15% share of food expenditures by 2050.
- In third position, meat and dairy products will grow between 3.5% and 5% per year. By 2050, they will account for 14% of food expenditures.
- Finally, healthy, high-value foods such as fruits, vegetables, and fish will grow steadily, though less explosively, at slightly over 3% per year.

Sensitivity analysis using alternative projected rates of per capita income growth gives a range of plausible estimates for food market growth (Annex Table L3). However, the relative growth rankings remain largely unchanged.

⁶ These projections are based on United Nations population projections, expenditure elasticities computed from the 2008 Tanzania LSMS survey, and a projected 2% annual increase in per capita incomes.

3.2.4 Spatial dimensions of food market growth

Urban areas will account for 75% of the projected growth in Tanzanian food demand over the coming four decades (Table 2). While major cities such as Dar es Salaam and Arusha will account for about half of this urban growth, the other half will emerge across a constellation of small towns in the high-population density areas around Lake Victoria and in the central and southern highlands (Figure 2).

Regionally, urban growth in the immediate cross-border areas of neighboring countries will offer even larger markets for Tanzanian agribusinesses. Currently, these cross-border areas on Tanzania's periphery house urban populations roughly double those inside Tanzania (Table 3). Given roughly comparable urban growth rates, these cross-border markets will likely offer urban markets twice as large as those inside of Tanzania. Given Tanzania's surplus land, fertile soils, and favorable climate, this suggests that nearby cross-border regional markets will offer even larger markets than Tanzania's own fast-growing cities.

Table 3. Population in Tanzania and Immediate Cross-border Zones

Population, 2000 (millions)				
	Rural	Towns	Cities*	Total
Tanzania	33.1	4.1	4.0	41.2
Rest of region **	104.4	8.0	11.5	123.8
Total	137.5	12.0	15.5	165.0

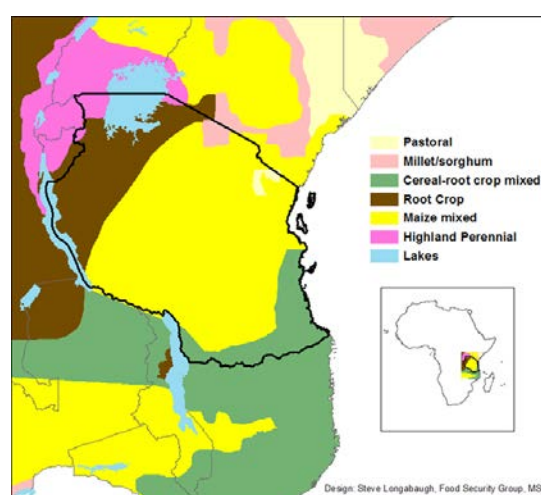
* Urban areas (cities) defined as those over 250,000 in population

** Tanzanian periphery pictured in Figure 2

Source: GRUMP (2000).

To exploit these opportunities, Tanzania's private sector will require skilled manpower trained in food packaging, storage, food safety, financing, logistics and trade. About 40% of this cross-border urban growth will occur in the banana and root crop belts, with 60% in the maize belt (Figure 4). This suggests that an understanding of consumption trajectories in different food staple zones will be necessary in targeting neighboring regional markets.

Figure 4. Food Staple Zones in Tanzania and Surrounding Areas



Source: FAO 2001, Longabaugh et al. 2011.

3.3 Implications for Skilled Manpower Requirements

3.3.1 Skills for growing segments of the food system

Looking forward, SUA will need to supply skilled manpower for growing segments of the food system. Prepared foods, beverages, livestock products, and horticulture appear to be growing most rapidly (Table 2). Markets for basic grains such as rice and maize will likewise expand significantly in absolute terms, though far more slowly than processed and prepared foods. Increasingly, growth in maize markets will be tied to the livestock sector and its demand for animal feeds.

Employers will require new skills in food processing, biochemistry, distribution, logistics, packaging, commodity price hedging, food safety, storage, and nutrition to complement an increased on-farm demand for skilled agronomists, veterinarians and irrigation engineers. With increased reliance on sometimes-volatile world commodity markets, market forecasting, commodity risk management, market monitoring, storage and regional logistics platforms will all become increasingly important for farmers, feed companies and food processors.

Skill requirements vary substantially by sector, size of firm and level of technical sophistication. Table 4 contains a summary of skill requirements mentioned by private firms during interviews with the needs assessment team. Large hotels, biotech industries, livestock industries, fertilizer manufacturing, and commodity trading firms require more highly skilled university graduates than other sectors. However, even they indicate that university graduates constitute less than 10% of their manpower requirements, while middle management of diploma holders and secondary school leavers account for about a third of these needs. A growing array of semi-formal, small-scale agribusinesses and farms tends to hire workers with lower levels of education. Many of these firms will continue to contract out specialized functions – such as nutritional analyses and packaging – to specialized firms.

Table 4. Skill Requirements Identified by Private Sector

Sub-sector	Areas of expected future growth	Skills needed
Production	<ul style="list-style-type: none">• Contract feeds farming (maize and soya)• Poultry contract farming• Livestock• Seeds production• Vegetable seed production• Vegetable and fruits production	<ul style="list-style-type: none">• Farm Management• R&D on soil quality, sisal by-products, environment• Poultry farming• Poultry breeding• Extension• Crop breeding
Processing	<ul style="list-style-type: none">• Poultry (processed chickens)• Cotton• Vegetable oils• Cereal processing	<ul style="list-style-type: none">• Plant operators• Processing and packaging• Practical entrepreneur training
Food hygiene and safety		<ul style="list-style-type: none">• Product development to cater for hospitality industry• Business skills• Environmental standards and compliance
Cross-Cutting		<ul style="list-style-type: none">• Food scientist• Policy analysis• Marketing and price forecasting

Source: Msuya (2011)

3.3.2 Farm inputs and processing industries

Over the coming decades, post-farm processing and farm input supply will likely grow much faster than on-farm production (Figure 2). With the decline of Tanzania's parastatals, most of these new agribusiness firms will operate in the private sector. Hence, SUA will increasingly need to serve private sector agribusiness clients if it is to maintain its relevance and contribute to the country's development.

3.3.3 Private sector clients

It will be increasingly important for SUA to develop ongoing communication channels with private sector agribusiness firms and commercial farms in order to better understand their emerging skill requirements, assess the utility of current curricula, and tailor teaching and research to serve SUA's increasingly private sector clients. Private sector advisory boards, student internships, faculty consulting and industry-based M.Sc. research on applied problems affecting specific food industries all offer means for integrating SUA and SUA graduates into the fabric of Tanzania's modernizing agricultural system.

SUA faces growing competition in the education market. The National College of Tourism (NCT), the Vocational Education and Training Authority (VETA) and over one hundred private colleges and universities have emerged to service the hospitality and tourism industry, as have regional competitors in Kenya and Uganda. Many private and public universities offer degrees in commerce, management, supply chain logistics, and other tools relevant to modern agribusiness. Therefore, SUA faculty and students will need to engage closely with its private sector clients in order to remain a relevant, preferred partner in training and research in agriculture and food industries.

4. Gender—A Cross-Cutting Issue

The Constitution of the United Republic of Tanzania endorses gender equality and equity, and guarantees full participation of women and men in social, economic, and political life. Tanzania has made significant efforts to address gender inequalities since independence, particularly in the domains of legal rights and representation as well as education. The Ministry of Community Development, Gender and Children was established in 1990 to oversee gender development in the country. It facilitated the Women and Gender Development Policy in 2000 to mainstream gender into all policies and programs. However, women continue to experience disadvantages relative to men throughout their lives in several areas that significantly impact Tanzania's ability to achieve economic growth. For a more complete assessment of gender issues in Tanzania see USAID's Gender Assessment of Tanzania (2003).

The Government of Tanzania has indicated increasing support for issues related to women and children's rights. These include amending the Constitution in 2004 to increase women's participation in the National Parliament (currently about 35% female), and in 2000 with the passage of the Women and Gender Development Policy (National Strategy for Gender Development, 2005). This Policy uses activities that target women's advancement and focuses on building gender capacity in a range of ministries by placing people with gender expertise, called Gender Focal Points (GFP), from the ministries down to the district-level governments. However, women in Tanzania continue to face multiple constraints. Perhaps at the root of these constraints is Tanzania's general level of poverty (its ranking is 151 of 173 countries); scarce governmental resources that limit the ability to meet

basic goals for health care, infrastructure construction and maintenance, literacy, and training; or its more ambitious goals for employment, knowledge management, income generation, and social security (USAID, 2003). Restrictive cultural traditions or discriminatory laws often hamper girls and women's efforts to attend school, enter some professions, avoid unwanted sexual relations or marriage, inherit property, obtain credit, achieve positions of political power, or otherwise participate as full and equal partners in society.

Women are engaged in many aspects of agricultural work in Tanzania. In the 2002-3 National Census of Agriculture, women-headed households comprised 20% of all households surveyed, a 14% increase from the previous census (National Bureau of Statistics, 2003). However, these households face many constraints not encountered by male-headed households (USAID, 2003).⁷ These issues compound the cultural and religious constraints that women face on a daily basis, leading to a higher percentage of women-headed households reporting that they often or always face food shortages (National Bureau of Statistics, 2003).

Gender issues are considered throughout the remainder of this document as part of the overall assessment of needs for long-term training at both SUA and MAFC, for institutional capacity-building at SUA, and for facilitation of collaborative research and research-extension linkages involving SUA and the research and extension services of MAFC.

5. Assessment of Long-Term Training Needs

This section examines the needs of SUA and MAFC for M.Sc. and Ph.D. degree training, taking into account their current staff numbers and anticipated future demands for personnel with advanced skills. Related issues are also addressed, including those related to gender, and to existing policies pertaining to recruitment, retention, and retirement, among others.

5.1 Academic Staff Numbers at SUA and Staff-Student Ratios

Academic staff numbers by rank for the period 2000/01 to 2010/11 are shown in Annex C, Table C.1. Among other things, this table shows that the percentage of staff at the professor level rose from 10% in 2000/01 to 16% in the period 2005-2008 (because a freeze on hiring had stopped recruitment of junior staff) and back down to 14% in 2010/11. Annex Table C.2 shows a breakdown by rank and by department as of September 2011. These figures show that the Faculty of Agriculture makes up 42% of total staff numbers, compared to 17%, 15%, and 14% for the Faculties of Science, of Veterinary Medicine, and of Forestry and Nature Conservation, respectively, and 12% for Institutes and Centres. In addition, Assistant Lecturers make up 31% of the total, compared to 14-19% for other ranks except Tutorial Assistants (only 6%), indicating new hiring since the lifting of the freeze.

As noted in a report on higher education in Africa (Tettey, 2010), the backbone or the foundation of the university's business is its academic core—that is, the basic handling of knowledge through teaching via academic degree programs, research output and the production of graduates. Using current figures on students and staff, the overall student-staff ratio for SUA, irrespective of faculty

⁷ These include less access to land, less money to buy land, and more use of borrowed or illegal land; fewer livestock; higher number of orphans; fewer agricultural inputs used, such as improved seed and fertilizer; and less access to extension services.

and rank is about 15 which is quite favorable given that most universities in Africa have a ratio ranging from 20 to 40 (Tettey, 2010). This is an important measure. While there is no guarantee that additional staff will be any better at teaching, generally speaking the more academic staff a university employs, the more educational support students will receive and the more value they will get out of their degree.

5.2 Key Issues Concerning Female Faculty Members and Administrators at SUA⁸

In 2002, SUA initiated a Gender Policy (see Annex I), partly in an effort to increase the number of female faculty members. The Gender Policy Integration Committee (GPIC) oversees the implementation of the policy. Since its establishment, the GPIC has conducted the following activities:

- Establishment of the SUA Women Development Support Project
- Gender capacity development for SUA staff
- Introduction of the Pre-entry Science Programme for female students
- Sensitizing girls to join SUA degree programmes
- Sensitizing secondary school girls to opt for natural science subjects
- Sensitization workshop on gender issues to secondary school teachers
- Mainstreaming gender in training, research, and outreach activities

Because of activities such as the above, the percentage of women academic staff has increased from 5% in 2000/01 to 19% in 2010/11 (Table C.1). While this represents progress, the SUA Strategic Plan stresses the need to increase female staff retention rates as well as female staff numbers.

5.2.1 Low numbers of female faculty members at SUA.

This stems not only from the lack of females entering the agriculture profession, but also from the fact that many young women are uncomfortable studying math and science at a young age. Since a number of agricultural degree programs require significant amounts of math and science, this creates a bottleneck for women entering the profession. For the past few years, the percentage of female faculty overall has been slowly improving. In 2005, the proportion of female academic staff was 16 %, while by July 2011 it had increased to 19%.

5.2.2 Low numbers of female administrators at SUA.

The Vice Chancellor appoints individuals in some positions (Head of Departments, Deans and Directors, Associate Deans and Deputy Directors) based on the SUA Charter. Before the Charter was implemented, the positions of Head of Department and Dean were acquired by winning votes from the staff in their respective Departments or Faculties. This system was very challenging to female staff who were not willing to compete for votes and frequently decided to shy away from those positions. Currently, the number of females in administrative positions is low but has improved compared to previous years, from 31% in 2005 to 34% in 2011. In the category of Deans, Directors, Associate Deans, and Deputy Directors, there are 6 (22%) females. However, among 25 departments at the University, only one Department Head is female.

⁸ This section draws on Nchimbi-Msolla (2011).

5.2.3 Cultural constraints.

Women have primary responsibility for care of children and elderly parents, as well as other social responsibilities. Frequently when they marry and have children, it impedes their ability to complete studies or receive promotions, and they may leave the workforce. When (and if) the woman returns, they face mandated age limits on certain positions, as well as a required retirement age at SUA. This issue was mentioned frequently as contributing to the low number of female faculty, and women in more senior positions.

5.2.4 Human resource concerns

It appears that there is no written “affirmative action” policy to recruit more women, but mention was made that if a male and female have equal qualifications, preference will be given to a female. Having job descriptions with mandatory age requirements has a negative influence on attracting women faculty. Interviewees mentioned there is no funding specifically for faculty professional development. This is a concern for women since they often have less chance to travel due to family obligations and cannot attend conferences and workshops easily. It was noted frequently that there are few women in senior-level positions at SUA.

5.3 Training Needs Expressed by Those Contacted

5.3.1 Heads of Department at SUA

Training needs were estimated by the seven Heads of Department of the Faculty of Agriculture based on three main factors:

- Establishment of new programs that need new instructors, within the departments of Animal Science and Production, and Food Science and Technology;⁹
- Aging faculty—some professors are retiring soon and therefore need to be replaced; this applies to all departments; and
- Expression of demand in specific areas, and therefore a need to respond by increasing faculty numbers, e.g., in Food Science and Technology.

The estimated training needs by department, area of specialization, and degree level from 2012-13 through 2015-16 are summarized in Table 5. Not surprisingly, 56% of the 245 new positions are at the Ph.D. level. The departments indicating the greatest total need for new positions were Agricultural Education and Extension (22%), Crop Science (21%), Food Science and Technology (18%), Agricultural Economics and Agribusiness (18%), and Animal Science (13%). The other two departments each accounted for about 5% of the demand. Other specific skill areas for which needs were expressed included a statistician to support faculty to design and analyze experiments properly and to teach students, an irrigation specialist, and qualified IT staff.

Without information about retirements over the last five years, it is difficult to say how well the magnitudes of the above expressed needs fit with anticipated needs of new or growing programs. However, based on analysis of undergraduate enrollments (Annex G Tables G.1 to G.3), we can identify the top five undergraduate degree programs in terms of the following indicators:

⁹ Potential sources of new demand include programs that are in the pipeline (Bachelor of Community Development and Agricultural and Rural Innovation Systems) or being considered (Finance and Economics).

Table 5. Estimated Training Needs by Department, Specialization, and Degree, 2012-13 to 2015-16.

Specialization	2012-13		2013-14		2014-15		2015-16		TOTAL	
	MSc	PhD	MSc	PhD	MSc	PhD	MSc	PhD	MSc	PhD
<i>Dept Ag Ed and Extension</i>										
Community Development	1	0	1	2	1	2	2	1	5	5
Ag and Rural Dev Systems	1	2	2	1	2	1	1	2	6	6
Sociology	1	2	2	1	1	2	2	1	6	6
Ag Exten & Rur Innovation Systems	1	2	0	1	1	1	1	1	3	5
Management and Admin	1	1	1	2	2	1	1	2	5	6
Sub-total	5	7	6	7	7	7	7	7	25	28
<i>Dept Animal Sci and Production</i>										
Dairy Processing Tech	2	2	1	1	1	1	1	1	5	5
Conservation Biology	1	2	1	1	1	1	1	2	4	6
Fish Breeding	1	1	2	1	1	2	2	1	6	5
Sub-total	4	5	4	3	3	4	4	4	15	16
<i>Dept Crop Science and Prod</i>										
Crop Physiology	0	2	1	2	1	2	2	1	4	7
Horticulture	0	2	2	1	2	1	1	2	5	6
Research Methodology	1	2	1	1	1	2	2	1	5	6
Agronomy	2	1	1	2	2	1	1	2	6	6
Seed Technology	0	1	0	1	1	1	0	0	1	3
Landscape	1	1	0	1	0	0	0	0	1	2
Sub-total	4	9	5	8	7	7	6	6	22	30
<i>Dept of Food Science and Tech</i>										
Family and Consumer Studies	0	1	2	2	0	1	0	1	2	5
Catering and Hospitality	0	2	3	2	2	1	1	2	6	7
Textile Sci and Tech	1	1	2	1	1	2	2	1	6	5
Public Health and Nutrition	2	1	2	2	2	1	1	2	7	6
Sub-total	3	5	9	7	5	5	4	6	21	23
<i>Dept of Soil Science</i>										
Soil Chemistry	0	0	0	1	0	0	0	0	0	1
Ag Land Use Planning and Mgt	0	0	0	1	0	0	0	0	0	1
Soil Biology	0	0	1	0	0	0	0	1	1	1
Soil Physics	0	0	0	2	0	0	0	0	0	2
Geology	1	0	1	0	0	1	0	2	2	3
Plant Nutrition	0	1	0	0	0	0	0	0	0	1
Sub-total	1	1	2	4	0	1	0	3	3	9
<i>Dept Ag Econ and Agri-business</i>										
Agric Finance	1	2	2	1	1	1	1	2	5	6
Human Resource Management	1	2	2	2	1	1	1	2	5	7
Econometrics/Statistics	1	1	2	2	1	1	1	2	5	6
Price Analysis/Marketing	1	1	2	1	1	1	1	2	5	5
Sub-total	4	6	8	6	4	4	4	8	20	24
<i>Dept Ag Engineering & Land Plan</i>										
Energy (biofuels, farm energy)	0	0	0	1	0	0	0	0	0	1
Crop Processing	1	0	0	1	0	1	0	0	1	2
Farm Machinery/Farm Mech	1	0	0	1	0	0	0	0	1	1
Irrigation & Water Resources	0	2	0	0	0	0	0	0	0	2
Land valuation	0	0	1	0	0	0	0	0	1	0
Sub-total	2	2	1	3	0	1	0	0	3	6
Grand Total	23	35	35	38	26	29	25	34	109	136

- Total enrollment in 2010/2011: Agric. Econ. and Agribusiness (1), Rural Development (2), Education (3), Tourism Management (4), and Applied Agricultural Extension (5)
- Annual growth rate of enrollment for programs created in 2001/02 or earlier: Agric. Econ. and Agribusiness (1), Agric. Education Extension (2), Agronomy (3), Environmental Science and Management (4), and Forestry (5)¹⁰
- Annual growth rate of enrollment for programs created between 2003/04 and 2008/09: Tourism Management (1), Rural Development (2), Range Management (3), Aquaculture (4), and Biotechnology and Lab Sciences (5)
- Percentage of female students enrolled in the program in 2010/2011: Irrigation and Water Resources Engineering (1), Food Science and Technology (2), Environmental Science and Management (3), Rural Development (4), and Tourism Management (5).

Annex G Table G.4 shows postgraduate enrollments broken down by program, degree level, and gender for the three-year period from 2008/09 to 2010/2011. Total enrollments have risen by roughly 50%, from 216 in 2008/09 to 315 in 2010/11. The percentage of female enrollment has risen slightly from 27% to 30%. Identifying the top five postgraduate degree programs using criteria similar to those above gives the following results, which should be treated with caution given the short time period covered. (Programs in existence for only two of the three years are not included.)

- Total enrollment for all three years: Rural Development (1), Agricultural Economics (2), Management of Natural Resources (3), Agribusiness (4), and Crop Science (5)
- Annual growth of enrollment over the three years: Food Science (1), Soil Science (2), Management of Natural Resources (3), Tropical Animal Production (4), and Crop Science (5)
- Percentage of female students in total enrollment for all three years: Veterinary Medicine (1), Forestry (2), Rural Development (3), Agricultural Education and Extension (4), and Management of Natural Resources (5).

5.4 Training Needs Expressed by MAFC Units

Information on MAFC researchers is given in Annex C, Table C.3, including gender, age, highest educational qualification, discipline and commodity focus, and station where currently assigned. Analysis of the data in this table shows that a high proportion—44%—of the researchers are 50 years of age or older, 30% are between 40 and 50, and 26% are younger than 40. This distribution doubtless results from the past hiring freeze, and adds urgency to the need to train and recruit new research personnel. Disciplinary areas with a relatively large number of researchers (more than ten) and research staff with an average age of 45 years or older include Plant Breeding (49 researchers, average age 49), Soil Science (44 researchers, average age 49), Plant Pathology (12 researchers, average age 47), and Agronomy (63 researchers, average age 45).

5.4.1 Deputy Permanent Secretary and Directors

During two meetings, senior staff of MAFC identified training needs in the following areas:

- Irrigation engineers, given the future importance of irrigation
- Researchers: areas of current weakness include climate change and agricultural marketing

¹⁰ As indicated in Annex Table G.3, growth rates for all programs but Agric. Econ. & Agribusiness are negative from 2001/02 to 2010/2011. Enrollment figures for 2010/2011 may need to be verified.

- Horticulture and value addition in fruits and vegetables
- Policy analysis
- Post-harvest technology, especially agroprocessing
- Seed technology
- Training for the new Information and communications unit, and the Inspectorate team (in areas of food safety and sanitary and phytosanitary regulations, related to regional trade)

5.4.2 Administration and Human Resources Department¹¹

- Areas of training for the management team (33 men, 10 women): strategic leadership and team building; change management; human resources planning; project formulation and implementation; report writing; grievances handling; succession planning; risk management; women leaders.
- Areas of training for mid-level officers and front office staff (20 women, 20 men): customer care; ethics; office procedures; records keeping/handling/indexing and documentation; and e-records.

5.4.3 Division of Land Use Planning and Management

Needs expressed included: integrated soil fertility management; agro-forestry development based on an ecosystem approach; methods of delivering technologies to farmers; factors affecting adoption of soil and water conservation technologies; dryland farming techniques; land surveying, demarcation, titling; preparation of sustainable land use plans; land management economics; land use information management; and gender mainstreaming in land use planning and management.¹²

5.4.4 Mechanization Department¹³

Needs expressed include: retraining of senior staff on mechanization technologies; training on computer-aided design systems; establishing and running of machinery hire services; running small- and medium-scale agroprocessing machines for food and commercial crops; utilization of renewable energy sources for agricultural processing and irrigation; testing of agro-machines, equipment, implements, and setting standards for local equipment manufacturers.

6. Assessment of Institutional Capacity-Building Needs for SUA

This section addresses needs of SUA at the institutional level, other than those related to long-term training, and for the Faculty of Agriculture. These include human resource development and physical infrastructure and facilities, as well as policies and procedures, organizational structure, and curriculum. Areas in which external factors, such as national policy, budget, or infrastructure capacity, pose constraints to SUA's effectiveness will also be noted. The team recognizes the very substantial amount of information and insights contained in SUA's Corporate Strategic Plans, and in the preliminary report on restructuring. This section will necessarily have a narrower focus, but will attempt to add value by highlighting areas that seem especially important.

¹¹ From "Notes for Discussions with Needs Assessment Team from SUA and USAID Tanzania, 25 August 2011." DAHRM, Administration and Human Resources Division.

¹² "Training Needs, Institutional Capacity Needs and Research Priorities," MAFC, Division of Land Use Planning and Management, September 2011.

¹³ "Needs Assessment Team—SUA, MAFC and USA." MAFC, Mechanization Department, September 2011.

6.1 Human Resource Development

6.1.1 Short-term training and exchanges for academic staff

Enhancing the research programs at SUA and the Ministry of Agriculture in Tanzania is very important for the agriculture sector as well as for the teaching program at SUA. Research is only as good as the quality of the research scientists. Therefore, improving research skills will be very beneficial for the research programs of SUA and the Ministry of agriculture. SUA's teaching, research and outreach programs can be enhanced several ways.

It is important that the leadership at SUA create an atmosphere that will help to develop and motivate quality faculty. Self-improvement is an important way to improve professional competence. The Internet provides excellent opportunities for self-learning. Researchers need to read good journals and learn the current technologies and techniques being used by scientists around the world. Improving the selection of books and journals in the library is needed for the faculty, staff and students. TEEAL ("The Essential Electronic Agricultural Library"; <http://www.teeal.org/>) provides access to over 200 journals from 1993-2009. The SUA Library has subscribed to TEEAL in the past, and could renew that access for less than the standard \$5,000 cost under a special Gates Foundation grant available to Tanzania.¹⁴

Organized professional faculty improvement can be facilitated in several ways:

- A program that funds individuals to visit labs in the U.S. to update their knowledge of and skills in the most recent advances will be very helpful. These one- or two-month visits would also be conditional on the scientists' developing a competitive grant for future funding for their continued collaboration. It will be very important to select collaborators who have an interest in international collaboration. The USAID Collaborative Research Support Programs (IPM, INTSORMIL, Pulse, etc.) would be an excellent source of collaborators since many scientists in these programs have 20 or more years of collaborative research experience and access to research funds. In addition, the CGIAR institutes would be excellent partners for collaborative research.
- Faculty can attend special courses in the U.S. in their field, i.e., competitive grant writing, intellectual property rights, gender, molecular techniques, integrated pest management, leadership, etc. Special programs could be developed for each faculty member to maximize the benefit of their visit to the U.S. The returning faculty can then give a workshop on the same topic at SUA and/or the Ministry of Agriculture.
- Workshops at SUA for faculty can be given in the same areas as above. The workshops can be led by professionals from Africa, Europe and the U.S.
- Workshops on pedagogy, such as "active learning," would help support the teaching program.
- Faculty seminars at SUA will help to create an atmosphere where research topics are reviewed and important topics are discussed. The seminars will familiarize faculty with

¹⁴ See <http://www.teeal.org/purchase> and contact the TEEAL Project Office at teeal@cornell.edu for specifics.

research being conducted at SUA. The seminars will also be very instructive for the graduate students.¹⁵

- Sabbatical leave for faculty to learn new technologies.
- Support for researchers to present papers at international meetings. This would provide an incentive to do good research.

The NARS should be utilized more in giving the SUA students practical training experience. Most of the SUA students lack real-world experience, and working with the NARS on training will strengthen the collaborative research programs.

As the private sector develops in Tanzania, collaborative research opportunities with the private sector need to be explored. This will take awareness building on both sides. Public sector researchers need to be aware of intellectual property rights (IPR) and other private sector issues. The private sector needs to be aware of the public sector's interest in promoting health and nutrition issues, creating new jobs, increasing education access and enhancing the environment. Working with the private sector is also a very important area of study for the students.

6.1.2 Issues affecting female faculty members and nonacademic staff¹⁶

Human resource issues. SUA has a Code of Ethics that is distributed to faculty and students, but the administrative/clerical staff do not receive a written copy nor do they receive a detailed orientation. Since a large percentage (about 60%) of the clerical staff is female, it is important they receive this to understand their rights.

Funding. It was noted that many of the efforts surrounding gender, including training workshops, programs to attract and mentor female students, and gendered research, have all been dependent on external funds. Without a consistent funding source, or prioritization by SUA, this bottleneck prevents gender mainstreaming from occurring throughout the campus.

Research. Those interviewed indicated that gender is a required component of SUA research. However, upon reviewing the latest issue (December 2010) of SUA Research News, no journal abstracts mentioned the key word "gender." Of the 100 total M.A./M.Sc. theses that had been approved, only one (from the Rural Development area) explicitly had a gender focus. One Ph.D. thesis had a gender topic. If gender is to be mainstreamed, there must be a focus on collecting gendered data and focusing explicitly on gender-related topics.

Teaching. In the undergraduate curricula there are only two full courses offered on gender by the Development Studies Institute: RD 201 Introduction to Gender and Development and RD 301 Gender and Development. These two courses are compulsory for students taking B.Sc. Rural Development and are electives for other programs. For the postgraduate program, there is only one full course on gender (RD 603 Gender and Development). This course is compulsory for students taking an MA in Rural Development. Other Master's students take it as an elective. Similar to the undergraduate

¹⁵ A factor reducing seminar attendance is that the diverse activities of academic staff often take them away from campus.

¹⁶ See Annex J for a parallel assessment of issues affecting female officers in MAFC. This section draws from Nchimbi-Msolla (2011).

programs, gender issues have been included in a few courses as special topics or in some courses in B.Sc. Human Nutrition and B.Sc. Agricultural Education and Extension. There is a need to examine all curricula for ways to integrate gender throughout both lecture and practicum courses.

6.1.3 Recommendations for addressing gender issues at SUA

Human Resources

- Include external searches to increase the number of qualified female faculty and administrators. Consider dropping the age requirement when recruiting to attract more females.
- Create professional development opportunities that enhance women's abilities to receive promotion, such as funds provided annually on a competitive basis for female faculty and administrators to attend workshops or seminars that improve their professional skills.
- Review the "SUA Code of Ethics" to incorporate the SUA Gender Policy vision statement, and not only Sexual Harassment.
- Provide orientation and written documents to both faculty and clerical/administrative staff on gender issues.

Gender Policy Integration Committee (GPIC)

- Provide consistent funding for regular gender sensitization workshops for new and existing faculty and staff.
- Redesign the Objectives and Strategies in the Gender Policy to be SMART (Specific, Measurable, Appropriate, Relevant and Time-bound). Current Objectives and Strategies are not measurable.
- Encourage female faculty to mentor new female faculty and staff, e.g., by providing release time from other duties, or merit pay.
- Designate a full-time person to support GPIC work plan objectives.
- Provide regular reports to SUA administrators and faculty on progress related to GPIC work plan.
- Reinstate the program to visit secondary schools to sensitize teachers, parents, and young girls about the importance of science and math education.

Research and Teaching

- Provide more training in incorporating and monitoring gender issues in research
- Provide exchange research opportunities and collaborations with iAGRI university partners doing gendered research
- Develop gender collaborative working group with members from NARS, SUA, NGOs (including Tanzania Gender Networking Program, USAID WID/GEWE and private sector stakeholders) to identify areas of need, funding and research opportunities in gender
- Examine all curricula for ways to integrate gender issues into lecture and practicum courses

6.2 Infrastructure and Facilities

In this section, we focus on electricity and water supply, bandwidth and ICT infrastructure, library and teaching facilities, and other support needs for teaching and research.

6.2.1 Electricity

Reliable electrical power is a must, as noted in the Proposed Corporate Strategic Plan for 2011. SUA obtains its electricity from the national grid and from its own generators.

- The availability of electricity from the national grid appears to have declined significantly. The Estates Manager, Mr. D. Komba, signaled that Morogoro's supply is only one-quarter of what it was previously. A load-shedding regime results in no daytime power two days per week, and no nighttime power three days per week. A modification of the transmission system is also needed to establish one line into SUA rather than two at present (one from Morogoro town, another through Mzinga).
- Generators include a 350 KVA generator behind the main Administration building, which serves that building and the central teaching buildings; a 40 KVA generator at the Faculty of Veterinary Medicine; a 20 KVA generator serving the SMC hospital; two 7 KVA generators, one serving Pest Management and one the Computer Center, and another small one just acquired by Soil Science. SUA has depended on donor funding to acquire generators, and they are expensive to operate. Costs have risen with fuel prices and declining fuel efficiency as the generators age.

The costs to SUA's program resulting from inadequate electricity is difficult to estimate, but clearly large, as power outages interrupt Internet use and research processes and damage research materials and electronic equipment. In addition, student hostels are not served by generators. No estimate could be obtained of the additional electricity capacity that is needed. One person interviewed indicated that a consultant reporting to the DVC (Administration and Finance) has been charged to study this. About 10 years ago Salim (2002) led a task force to investigate persistent electricity problems at the SUA main campus and came up with some recommendations. Although it is not clear what actions were taken on the recommendations of the study, it would appear that the problems of today are quite different from those of 2002 and a new study would be needed. Given current developments, however, any major investments in electricity by SUA should take into account the likely impacts of ongoing national discussions on investment in electricity generation. The government is currently contracting with serious entrepreneurs within and outside the country to invest in electricity generation. If all goes according to plan, about 12 months from now there may be excess electricity supply to the national grid, which will benefit SUA. Therefore, any measures to be taken by SUA to fill the current gap should be of a short- or medium- rather than long-run type.

6.2.2 Water

Water supply at the SUA main campus is currently adequate, but not at the Solomon Mahlangu campus. The option of diverting water to SMC from the line that leads to the main campus from Mzinga is being considered. Whether this could be done without creating shortages at the main campus is not clear, particularly in light of significant anticipated increases in student numbers from 7,000 to 10,000 or 15,000. A feasibility study for alternative water sources for SMC was conducted by Norconsult in 2005. It is not clear whether there has been any follow-up to this report.

6.2.3 Information and communication technologies (ICT)

Supporting and enhancing ICT is very important for all functions of the university: administration, research, and teaching. ICT-related capacity constraints are detailed in the Corporate Strategic Plan

and in Sanga (2011). Measures proposed to address them are contained in the Corporate Strategic Plan Work Plan (p. 30 section 1.6, and pp. 36-38 Theme 6) and in Sanga (2011).

Our team's view is that the two most important needs are improved bandwidth to ensure adequate Internet connectivity (currently, the suanet e-mail address is rarely functional) and more reliable electricity supply. Resolving the bandwidth problem seems to involve deciding whether to wait for improved infrastructure (fiber optic link) to become available through a World Bank project, or to contract with a commercial firm to provide the infrastructure, which some are concerned may be too expensive. A study to evaluate these and other alternatives should be commissioned, if one is not already under way.

Other needs include:

- Insufficient number of computers—at the moment, on average there is roughly one computer for 42 students available for training purposes.
- E-mail communication is erratic.
- Linked to the power outages, computer usage is frequently interrupted.
- Training for software management and a high-quality virus-free computer laboratory.
- Qualified IT staff to ensure adequate maintenance of IT equipment and training at all levels.
- Funds for purchasing relevant software packages for both teaching and research.
- Computer use policies for faculty, staff, and students; a possible template for developing such policies is MSU's policy on "Acceptable Use of Computing Systems, Software, and the University Digital Network" in Annex K. Department-specific policy statements could be developed as well.
- Measures—in terms of both physical facilities and policies—to ensure server and data security.¹⁷ As SUA's administrative information systems become computerized, additional policies and procedures will need to be developed to ensure security and acceptable use of sensitive data. An example is MSU's Institutional Data policy (accessible at http://eis.msu.edu/documents/institutional_data_policy_dec10.pdf).

6.3 Support for Teaching

The most pressing problem seems to be a growing shortage of classroom facilities, caused by the increase in student numbers. One staff member noted that what used to be classes of 20-25 students are now attended by 40 students, with some having to stand. Similar shortages are affecting laboratory space and lab equipment need for science teaching; there are too many students at each microscope and lab station. At Solomon Mahlangu Campus, shortage of lab space has resulted in a need to use secondary school labs to teach the university students. Space in student hostels is also increasingly inadequate.

In terms of the quality of the teaching program, as evidenced by the skills demonstrated by SUA graduates, the team heard from many people interviewed that perceived shortcomings include:

¹⁷ Representatives of the Tanzania Chamber of Commerce, Industry, and Agriculture noted that in previous times, it was easy to place students as interns in parastatal organizations. TCCIA facilitates internships with private firms, but placements are more difficult now with greater student numbers. Also, some firms either lack the capacity to absorb interns, or are concerned that interns may steal valuable trade secrets.

- Lack of practical skills, resulting from inadequate opportunities for hands-on training
- Lack of networking and communication skills
- Lack of computer skills

Similar findings resulted from the tracer study conducted during 2005 and 2006 (PANTIL, 2008), which also reported financial management, business studies and entrepreneurship as highly demanded skills.

Regarding the lack of practical skills, remedies suggested included greater use of guest lecturers from private sector firms, internships in private companies, and investigation of teaching programs (such as Zamorano Agricultural University in Honduras and EARTH University in Costa Rica) that include a strong, compulsory entrepreneurship component. Challenges in implementing the first two of these remedies include the need for some financial resources to facilitate participation by private sector guest lecturers, and difficulties in placing increasing numbers of students in private sector internships.

The role of the Ministry of Agriculture Training Institutes (MATIs) should also be mentioned. There are 15 MATIs (soon to be 16), with a teaching staff of nearly 200, of which 80% have B.A./B.Sc. degrees. About 7,500 students were trained from 1991-2009 (see Mrinji (2011) for more information). Results of interviews with private firms in Dar es Salaam, Morogoro, and Arusha indicated that much of the demand is at the middle technical level, a demand that may be better met by graduates of diploma and certificate programs because they are more likely than SUA graduates to have the right blend of technical and practical skills. As the Principal of the Livestock Training Institute in Morogoro commented, their program is “competency-based” rather than “knowledge-based.” For this reason, and because the MATIs are a major employer of SUA graduates, the role of MATIs should be considered when establishing priorities for iAGRI project support

6.4 Support for Research

Needs other than those already noted (such as reliable electricity and Internet connectivity) include needs identified for crop science research (but probably matched by similar needs in other fields):

- Greenhouse facilities
- Field equipment (planters, threshers), to reduce experimental error caused by manual practices, and to give students hands-on practical experience.

Policy changes are also needed to improve incentives and rewards for research productivity. One example would be to expand the range of awards for faculty excellence. SUA currently has a designation for Professorial Research Chairs (*SUA - Research Policy, Focus Area, Guidelines and Regulations - August 2010*), but the small number of such chairs cannot be sufficient to reward all high-performing research staff. Another award, funded by Norway, recognizes “research of public value.”

6.5 Enhancing the Performance of the National Agriculture Library at SUA

The Library has suffered from a lack of sustainable funding that would enable it to perform its national agricultural library mandate adequately, as well as to meet the teaching and research needs of the SUA community. The Library has received sporadic support to finance its operations, mainly

from donors. Interviews with high-ranking staff of the Library revealed a number of gaps that may need attention from iAGRI:

- Provide computers to use for online searches.
- Pay for essential subscriptions, such as TEEAL, for which the Library has not paid its subscription since 2009. The library is in dire need of periodicals, and it was mentioned that the SMC does not have periodicals at all.
- Create a digital repository facility to enhance wide circulation of research results in order to promote the image of the university and its researchers.
- Purchase key books and other reading material required for teaching that cannot be obtained through AGORA or TEEAL.

The above measures become even more important when we consider that the amount given to students to purchase books has shrunk remarkably in the recent past. There was also a strong suggestion to consider solar power dedicated solely to the Library as an alternative source of power given the current power outages.

6.6 Support SUA's Capacity in Agricultural Extension

Agricultural extension is clearly stated as one of the functions of SUA and there is no question about its relevance given the need to improve teaching by making it more practical, and to help researchers test innovations on farmers' fields. Over time however, SUA's exercise of this function has not met expectations, and currently it is almost non-existent. Several factors have driven SUA to this low level of performance. To remedy this situation, effective involvement of SUA in extension activities has to occur within a clearly defined framework detailing core staff to drive the process, geographical areas of focus, goals, mode of operation, collaboration arrangements, funding mechanisms, a favorable incentive structure, and time frame. iAGRI has the potential to support the re-design of SUA's extension function for a fresh take-off¹⁸

6.7 Reviving the Role of the Institute of Continuing Education (ICE) at SUA

ICE is a well-established type of structure in many universities, particularly those for which agriculture is a core business. The main role of ICE is to develop, promote, and provide adult and continuing education including retooling of former graduates. It provides skills in new and emerging areas to graduates of different disciplines to enable them to be more efficient and effective. These functions are clearly consistent with the training agenda for iAGRI. The ICE at SUA is facing several challenges, ranging from lack of adequate staff, dilapidated facilities, and the need to adjust its strategy to fit current market demand for its products and services. While iAGRI cannot promise to meet all these challenges, it could at least support ICE in developing options that may be useful for its revival, taking into account the need to have a multidisciplinary staff dedicated solely to ICE, a clear sustained incentive structure, a vibrant marketing strategy, and attractive and modern facilities, such as accommodation, catering and conference halls.¹⁹

¹⁸ This is an excerpt from Mattee (2011).

¹⁹ This is based on insights from Mattee (2011).

6.8 Support for Central Administration

Observations include:

- Several administrators interviewed mentioned an interest in leadership training for department heads, deans, directors, and those in the Vice Chancellor's office. Suggestions for content and procedures for such training could be provided based on similar training routinely given to unit administrators by the iAGRI U.S. university partners.
- Computerization of academic and administrative records was also mentioned as a need. Advice on how to do this (and perhaps how not to do it!) could also be provided through the iAGRI partnership.
- Greater resources are needed to support university-level planning, especially now that strategic planning and related activities have increased in importance.

6.9 Constraints External to SUA

Factors beyond the control of SUA that constitute constraints or impose difficulties or costs include:

- The national electrical power grid (discussed above).
- Quality of secondary school education, especially in math and science, and particularly for female students. Many students enter SUA with poor preparation, which either extends instructional time or results in lower-quality graduates.
- The National Educational Policy, which is putting pressure on universities to expand student numbers more rapidly than university facilities can be expanded to address their instructional and other needs.
- National student loan programs, which now are available to students attending private universities, have provided incentives for rapid expansion of new private universities. These are a potential source of competition for SUA.

7. Assessment of Priorities and Support Needs for Collaborative Agricultural Research

The collaborative agricultural research component of iAGRI is intended to improve research quality in at least two ways: first, by bringing together researchers from SUA and MAFC (and possibly others from international agricultural research centers, U.S. partner universities, and the private sector) whose complementary areas of expertise can be synergistic, and second, simply by increasing the pool of funding to support research, and hence providing greater opportunities for research staff to strengthen their research skills by doing research.

Implicit in these goals is the perception that significant improvement is needed in several aspects of agricultural research in Tanzania, namely:

1. Research linkages between SUA and MAFC;
2. Research linkages with the private sector; and
3. Research linkages with extension.

Regarding (1), many whom we interviewed said that SUA and MAFC each tend to formulate their own research priorities. More recently, a commitment to collaboration is more evident among top

leadership. It was reported that six months ago the Minister of MAFC highlighted the need for SUA/NARS research collaboration, and it was suggested that this collaboration should be mandatory. One existing form of collaboration occurs when SUA M.Sc. or Ph.D. students conduct research at NARS field stations. According to the Deputy PS, MAFC is considering formation of two National Agricultural Research Institutes, one for crops and one for livestock, with some coordinating role played by the Tanzania Commission for Science and Technology (COSTECH). It was implied that these Institutes would provide a forum for collaborative research priority-setting, much in the way that the former Tanzania Agricultural Research Organization (TARO) used to convene all stakeholders to discuss research priorities.

Regarding (2), there seem to be relatively few research-private sector links. Some SUA researchers spoke of working with private firms, and interest in such links seems to be growing rapidly. Representatives of TCCIA noted that they had been visited by SUA researchers looking for links to the private sector. A view was expressed that bureaucratic procedures discourage NARS researchers from interacting with private firms. However, more researchers now want to commercialize the results of their work, which means partnering with private firms. More generally, it was noted that there is greater trust between the public and private sectors now. National and regional business councils have equal public and private membership.

Regarding (3), there is a Research-Extension Liaison Officer within the Research Department of MAFC. At SUA, there is also a Technology Transfer office that is apparently permanent and not there just because of the project that it now primarily serves. At the field level, a challenge mentioned for researchers in disseminating their results to farmers is that they must go through District Agricultural Officers, who have limited autonomy and report to representatives of the Prime Minister's Office as well as MAFC. Key institutions for establishing these links are the research-extension liaison committees at the zonal level.

7.1 Suggestions for Integration of Stakeholders in Research Planning

One way to significantly enhance research collaboration among SUA, the NARS, and the private sector would be to revive the past practice of establishing common research programs by convening the stakeholders involved in various commodities and research areas to discuss issues related to the research area. The stakeholders would discuss where the industry wants to be 10 years from now. Then they would discuss the needs that should be addressed including research, policy, training, infrastructure, equipment, publication, outreach, and education. Tanzania used to have a meeting of all the relevant stakeholders and researchers in which they would determine the research program for the various commodities. These planning meetings would be one venue to increase the awareness of the different research programs in Tanzania. They would also help make the research more demand-driven and relevant. A well-run planning meeting would dramatically increase the amount of collaborative research between SUA and the Ministry of Agriculture. The MSU Area of Expertise (AoE) program <http://www.joe.org/joe/1999june/a3.php> is a potentially relevant example of this approach to developing common research programs. The AoE program helps establish research priorities, link research and outreach programs, provide participatory opportunities for all stakeholders, find funding sources, and improve research capacity.

In addition to the planning meetings, it will be important to increase the awareness of the current research programs in Tanzania. This can be done by having good Web sites for each program, research publications/newsletters, seminars, field days, etc.

Another mechanism to increase collaborative research between SUA and MAFC is through the competitive grants program that will be established under iAGRI. Collaborative research involves partnerships with the public and private sectors, NGOs, foundations, and regional institutes and international centers. Each partner must bring quality skills and commitment to be successful. Currently several researchers have links with regional programs, i.e., East Africa Agricultural Network focusing on rice, Pan African Bean Research Alliance, etc. Individuals at SUA and MAFC should be made responsible for gathering information on different funding opportunities and making the information available to all the researchers. An example is the new competitive grants program from the Center for Coordination of Agricultural Research and Development for Southern Africa, to be located in Botswana.

7.2 Current Research Programs at MAFC and SUA

Annex F contains information on MAFC/NARS research programs, including those conducted together with SUA and other research organizations, and publications based on that research. Annex H lists SUA research programs and publications.

Observations about the focus of current research projects include:

- A review of the staffing lists in Annex C and the MAFC/NARS and SUA research projects listed in Annexes F and I suggests that it would be helpful to have more research on high-value fruits and vegetables. There are very few vegetable researchers listed and fewer vegetable projects. Strengthening research in this area would support economic growth as well as enhanced nutrition. Section 3 showed high population density in Northern Tanzania and surrounding countries, which offers markets for horticultural products.
- Establishing closer links between Tanzanian researchers and the private sector could be especially important for maize, cotton, and vegetable hybrids.

7.3 Research Priorities Identified by MAFC Directorates

7.3.1 Division of Land Use Planning and Management

Priorities included factors leading to the adoption of different soil and water conservation technologies, and local soil and water conservation techniques based on agro-ecological conditions.

7.3.2 Mechanisation Department

Priorities focused on areas where farmers face labor bottlenecks, such as: weed control; leveling, seed planting, drilling, and transplanting machinery; fertilizer application; and harvesting and post-harvest machines.

7.4 Research Priorities Identified by SUA

By design, the SUA CSPs do not deal with setting research priorities *per se*. However, they capture processes and methods that support and facilitate the implementation of research. At SUA, one of the largest research undertakings is Enhancing Pro-poor Innovation in Natural Resource and Agricultural Value Chains—EPINAV. Currently 15 research topics have been endorsed for funding

from a list of 47 viable concept notes that were selected from a pool of 75 concept note submissions. This is a significant undertaking by the SUA community given that the average annual budget per team is about \$30,000 and that each research team has on average five researchers who generally represent multiple disciplines and institutions. It will be useful to draw lessons and best practices from the research proposal selection process that EPINAV has used. Also, a good source of worthwhile research topics may be the concept notes that were considered viable but were not funded because of EPINAV budgetary limitations. From the MAFC side, the recently pronounced Zonal Agricultural Research Priorities need to be considered as well as the ongoing research across the zones. Also of considerable importance are the priority commodities of the USAID FTF initiative (of which iAGRI is part)—maize, rice and horticulture. An attempt to overlay all the above considerations would be one way to develop a mutually agreeable collaborative research list. Another criterion to consider in choosing collaborative research topics is the number and experience level of scientists working on the topic concerned.

The Director of Research and Postgraduate Studies advised that the collaborative agricultural research activities supported under iAGRI should be chosen to fill gaps not covered by CCIM and EPINAV, which are two university-wide research programs funded by Norway. One (CCIM) focuses on climate change and includes a set of 15 related projects on climate change impacts, mitigation, and adaptation. The other is the EPINAV program. EPINAV research themes include: (1) Innovation systems research; (2) Climate change and adaptation; (3) Policy research, analysis, and governance; and (4) Innovative communication methods. It is anticipated that over 15 projects will be supported under EPINAV. Research projects under both CCIM and EPINAV involve some collaboration with NARS researchers.

8. Next Steps

The foregoing sections have laid out a situation analysis in each of the key areas and have identified the strengths, weaknesses, and opportunities that exist for filling the gaps. However, under a typical resource limitation condition, it is logical to ask the question: what are the most important areas to attend to first given the budgetary situation of iAGRI? What should be done first and what can be done second in the event that additional resources become available if not from iAGRI then from elsewhere? This section therefore leads us to a priority-setting section where we suggest the process that will be followed.

Priority setting, also known as rationing or resource allocation, is a complex and difficult problem faced by all decision makers at all levels of systems including training and agricultural research. Mitton and Donaldson (2004) found decision makers were “frustrated with the lack of an explicit priority setting framework” and questioned “the credibility of resource allocation decision-making.” Several studies have reported that leaders desire an explicit framework to guide priority setting. In practice though, it does not really exist.

A possible framework for use during the priority setting workshop with key stakeholders would be to focus on setting priorities with respect to each of the key components of the iAGRI project, followed by sub-priorities for those components. An example is given in Table 6 below.

Table 6. Example Framework for Priority-Setting

Key Project Components	Areas for priorities and sub-priorities	Remarks (reasons/justification)
Long-term Training	<p>PhD</p> <ol style="list-style-type: none"> 1. General Processing , packaging and food safety 2. Dairy Technology 3. Fish Breeding 4. Animal Breeding 5. Conservation 6. Community Development 7. Ag and Rural Development 8. Sociology 9. Management and Administration 10. Crop Physiology 11. Horticulture 12. Research Management 13. Agronomy 14. Plant Breeding 15. Seed Technology 16. Landscaping 17. Family and Consumer Studies 18. Catering and Hospitality 19. Textile Science and Technology 20. Public Health and Nutrition 21. Soil Chemistry 22. Agric Land Use Planning and Mgt 23. Soil Physics 24. Plant Nutrition 25. Ag Finance 26. Human Resource Management 27. Econometrics 28. Price Analysis and Marketing 29. Energy (biofuels and Farm Energy) 30. Crop Processing 31. Farm Mechanization 32. Irrigation and Water Management 33. Land Valuation <p>M.Sc. (same subject areas as for Ph.D., with the addition of Geology)</p>	<ol style="list-style-type: none"> 1. This list is informed by the futuring work which provided insights into future skill requirements in the dramatically changing food industry; projections from the Heads of Departments in the Faculty of Agriculture; expression of skill requirements from the meetings held with Permanent Secretary and Directors in the MAFC. 2. If prioritization is only for iAGRI resources, then it is important to bear in mind that the total number for PhDs provided by the Project is 20. 3. PhD training by iAGRI has to begin in 2012-13 for iAGRI. Thereafter it will not be possible because a normal Ph.D. takes four years and one cannot be studying outside the life of the Project. Only 4.5 years of project life remain.

Short-Term Training	<ol style="list-style-type: none"> 1. Short-term training for academic staff in specialized areas—from 2 to 4 weeks covering a total of 100 staff per year 2. Short-term training for researchers in MAFC in specialized areas—from 2 to 4 weeks covering a total of 100 staff per year 3. Short-term training for teaching and research administrators 4. Short-term training for research technicians 	<ol style="list-style-type: none"> 1. This will cover a diversity of areas ranging from retooling, emerging, and new knowledge, etc. These courses may be carried out locally or outside the country 2. MAFC officials requested short-term training of research administrators, to help improve research quality.
Gender	<ol style="list-style-type: none"> 1. Increase the number of qualified female faculty/researchers in MAFC and administrators through activities that will attract them more (see text) 2. Deliberately support the gender policy integration committee at SUA (see text) 3. Integrate gender more effectively in research and teaching through developing effective gender M&E tools, provide exchange research opportunities and collaborations with iAGRI university partners doing gendered research 4. Develop gender collaborative working group with members from NARS, SUA, NGO's (including Tanzania Gender Networking Program, USAID WID/GEWE and private sector stakeholders to identify areas of need, funding and research opportunities in gender 	Both at SUA and MAFC, individuals interviewed indicated that although a lot is written and talked about on the need to promote integration of gender, funding is not usually provided.
Collaborative Research	<ol style="list-style-type: none"> 1. Soil and water conservation 2. Mechanization toward resolving labor bottlenecks 3. Climate change with associated mitigation and adaptation strategies 4. Pro-poor innovation in natural resources and agricultural value chains in the following themes: (i) Innovation systems research; (ii) Climate change and adaptation; (iii) Policy Research, Analysis, and Governance; and (iv) Innovative communication methods. 5. Agricultural sector policy research on export bans, linking farmers to markets, etc. 	<ol style="list-style-type: none"> 1. These topics are deemed relevant to both SUA and MAFC

Institutional Capacity Strengthening (SUA)	Enhance ICT facilities	<ol style="list-style-type: none"> 1. Bandwidth and number of computers both inadequate. 2. E-mail communication is erratic. 3. Power outages frequently interrupt computer use. 4. Need training for software and antivirus management. 5. Need qualified IT staff for training and maintenance of IT equipment 6. Funds for purchasing relevant software packages for both teaching and research 7. Computer use policies for faculty, staff and students 8. Measures—in terms of both physical facilities and policies—to ensure server and data security.
	Improve SUA National Agricultural Library (SNAL)	<ol style="list-style-type: none"> 1. Adequate supply of periodicals and computers to use for online searches. 2. Facilitate key subscriptions, for example for TEEAL 3. Facilitation of digital repository 4. Purchase required reading material
	Provide reliable electricity supply	Commission study of options for ensuring stable power supply
	Improve adequate, clean and safe water supply especially to SMC	Need to provide for growth in student numbers over the long run.
	Revive ICE to be in a position to reclaim its intended mandate and raise the image of SUA	Funds needed for developing options for revival of ICE
	Revisit the role of SUA in extension	An important part of SUA's mission statement

References

- Dixon, John; Aidan Gulliver, and David Gibbon (FAO), *Farming Systems and Poverty: Improving Farmers' Livelihood in a Changing World*, Rome: FAO, 2001.
- Dolislager, Michael, Steven Haggblade, and David Tschirley. "Food System Dynamics in Tanzania: Implications for Skilled Manpower Requirements in the Public and Private Sector." Draft iAGRI project report, September 2011.
- Global Rural-Urban Mapping Project (GRUMP), Population Density Future Estimates 2010, <http://sedac.ciesin.columbia.edu/gpw/> , 2010.
- Global Rural-Urban Mapping Project (GRUMP), Population Density 2000, <http://sedac.ciesin.columbia.edu/gpw/> , 2000.
- Katunzi, Justa (Jeremiah) "Needs Assessment for the iAGRI Project: Extension Section of the Crop Development Division," Draft Report, MAFC, September 16, 2011.
- Longabaugh, Steven, Michael Dolislager, Steven Haggblade, and David Tschirley, "Food System Dynamics in Africa," mimeo, East Lansing, MI: Michigan State University, 2011.
- Mattee, Amon Z., "An Analysis of Various Issues at Sokoine University of Agriculture: A Report for the Needs Assessment of the iAGRI Project," Draft Report, Department of Agricultural Education and Extension, SUA, September 17, 2011.
- Ministry of Community Development, Gender and Children, "A National Plan of Action for the Prevention and Eradication of Violence against Women and Children," 2001. Dar es Salaam, Tanzania.
- Ministry of Community Development, Gender and Children, "National Strategy for Gender Development," 2005. Dar es Salaam, Tanzania.
- Mitton, Craig, and Cam Donaldson, "Health care priority setting: Principles, practice and challenges," *Cost Effectiveness and Resource Allocation* (online) 2:3 (April 22), 2004. doi: 10.1186/1478-7547-2-3.
- Mrinji, Apenda, "iAGRI Needs Assessment: A Focus in Agricultural Training Institutes in Tanzania, 2011," Draft Report, MAFC, September 17, 2011.
- Msuya, Elibariki, "Need Assessment for the iAGRI Project," Draft Report, SUA, September 25, 2011.
- National Bureau of Statistics, National Census of Agriculture 2002-3, "Gender Profile of Smallholder Rural Agriculture Agricultural Population in Tanzania Mainland." Dar es Salaam, Tanzania.
- National Bureau of Statistics (NBS), Household Budget Survey 2007/08, Dar es Salaam: NBS, 2008.
- Nchimbi-Msolla, Susan, "Needs Assessment for iAGRI Project at Sokoine University of Agriculture (SUA)," Draft Report, SUA, September 17, 2011.

- Norconsult, Feasibility Study for Alternative Water Source for Solomon Mahlangu Campus, May 2005.
- Oakridge National Laboratory, Landsat Global Population Distribution, 2007, <http://www.ornl.gov/sci/landscan/>
- President's Office, (Public Service Management), "Code of Ethics and Conduct for the Public Service," 2003. Dar es Salaam, Tanzania.
- Salim, B.A., Task Force Report on Investigation of the Persistent Electricity Problems at the University Main Campus, Sokoine University of Agriculture, 15 August 2002.
- Sanga, C., Kayunze, K.A., Mages, M., "E-learning Technology – Enabling Science Education to Female Students". LAP Lambert Academic Publishing. ISBN 978-3-8443-8185-6.
- Sokoine Agricultural University, "Code of Ethics," 2005. Human Resource Department, Morogoro, Tanzania.
- Sokoine Agricultural University, Corporate Strategic Plan 2011-20, Morogoro, Tanzania, May 2011.
- Sokoine Agricultural University, Focal Needs Assessment, "Training Needs Assessment, Job Market Surveys and Tracer Studies for SUA Degree Programmes," Morogoro, Tanzania, 2005.
- Sokoine Agricultural University, Gender Policy Integration Committee, "Revised Gender Policy", Morogoro, Tanzania, 2011.
- Sokoine Agricultural University, Gender Policy Integration Committee, Gender Report, Morogoro, Tanzania, March 2010.
- Sokoine Agricultural University, Gender Policy Integration Committee, "Annual Workplan and Budget 2011-12". Morogoro, Tanzania .
- Sokoine Agricultural University, Task Force for the Restructuring of the Management System and Organization of the University, Revised Proposal for Restructuring the Management System and Organisational Structure of Sokoine University of Agriculture. Morogoro, Tanzania, March 2010.
- Tettey, Wisdom J., Challenges of Developing and Retaining the Next Generation of Academics: Deficits in Academic Staff Capacity at African Universities, Partnership for Higher Education in Africa, 2010. Available at http://www.foundation-partnership.org/pubs/pdf/tettey_deficits.pdf
- United Nations, World Population Prospects and World Urbanization: The 2007 Revision. New York: Population Division of the Department of Economic and Social Affairs of the United Nations, Secretariat, 2007. <http://esa.un.org/unup>, accessed Friday, August 05, 2011.
- USAID, "Gender Assessment for USAID/ Tanzania," 2003. Dev Tech Systems Inc., Washington, D.C.

Annexes

Annex A: Scope of Work for Needs Assessment

Scope of work for the U.S. university needs assessment team:

Conduct training and research needs assessment including the following activities:

- Establish needs assessment task force;
- Use available data to identify stakeholder concerns;
- Review literature on past models of research collaboration;
- Gather assessment data for projecting future food demand in Tanzania;
- Gather qualitative data from key informant interviews;
- Analyze data and identify discrepancies;
- Prepare written needs assessment report.

Scope of work for the in-country needs assessment task force

Working under the supervision of Dr. Isaac Minde, the following resource persons will work on the topics identified and provide a short report of not more than 10 pages double spaced on the areas identified. Tables that make sense will speak more than words. Also, a number of relevant annexes will be encouraged. The resource person will be expected to spend a total of **10 working days** from 22 August to 10 September 2011.

TERMS OF REFERENCE FOR DR ELIBARIKI MSUYA

1. Read and understand the objectives of the Needs Assessment in the context of the iAGRI Project.
2. Gather the following data and information:
 - i) Production and exports of the following main crop commodities—maize, rice, horticulture, beef, poultry and eggs
 - ii) Analyze the trends with a view to explain the cause of variations in the trends. Provide a sense of future growth in these commodities and reasons thereof.
 - iii) Visit Dar es Salaam to discuss with the following firms future skill requirements particularly with regards to processing, packaging, transport logistics, food safety and food hygiene issues: Bakhersa, Mohamed Enterprises, Chibuku Breweries, Interchick and Tanzania Food and Nutrition Center (TFNC).
 - iv) Visit Arusha – to discuss and collect relevant data on skill requirements in the horticultural industry. Visit with at least three grain processing firms and collect information related to (iii) above.
3. Provide a concise report on the above.

TERMS OF REFERENCE FOR TRAINING EXPERT, MAFC, Mr Apenda Mrinji

1. Number of staff going for further training by discipline , by gender, by degree program and by year
2. Where have the graduates gone by year by gender by discipline and by degree—1990 to 2010?
3. Are there any tracer studies or (near tracer studies of any type done from 1990 to date?—can we get the reports on these?
4. What is the output per year for MATIs by discipline by gender by employer (for private sector firm or company type if possible) for public sector state?
5. Provide a concise report on the above.

TERMS OF REFERENCE FOR PROF AMON MATTEE

1. Give a short description of the history, successes, challenges and possible future role of the Institute of Continuing Education (ICE) at SUA. To the extent possible align your description in the context of the iAGRI objectives (5 pages)
2. Based on your knowledge of SUA capacities, how could SUA become more effective in providing extension services? (2pages)
3. What in your views is the rationale for increased enrolment of students at SUA? (1 page)
4. What are the key drivers for increased enrolments and to what extent are the increases based on hard evidence? (1 page)
5. Provide an account of the incentive system of SUA staff over time—emphasizing on negative and positive reward mechanisms and how the system could be improved (1page)

TERMS OF REFERENCE FOR PROF SUSAN NCHIMBI-MSOLLA

1. Provide a listing of the current SUA research projects in the Faculty of Agriculture. The following format would be desirable: Title, Project duration, Funding level, collaborating institutions and names of collaborators by gender, and Principal Investigator.
2. In general would you consider the gender policy and gender committee being effective organs of the University?
3. The extent of the application of the gender policy in different SUA functions:
 - i) Admissions of students
 - ii) Recruitment of staff
 - iii) Representation to committees
 - iv) Appointments to key positions in the University—such as Head of Department, etc.
4. How is gender reflected in the undergraduate and post graduate curricula?
5. What are the current concerns across the women; men communities on the gender issue?
6. What kind of improvements can be made in the areas of concern in (2) above and how?

7. Provide statistics on student attrition (segregated by gender)
8. Names and ranks by gender of higher level administration personnel.
9. Provide a concise report on the above.

TERMS OF REFERENCE FOR MR HEZRON SANGA

1. What in your views is the rationale for increased enrolment of students at SUA?
2. What are the key drivers for increased enrolments and to what extent are the increases based on hard evidence?
3. Provide some clarity and or explanation to some discrepancies noted in the “Facts and Figures” and to some extent in the Corporate Strategic Plan as outlined by the Needs Assessment Team
4. Specifically, what are the plans for addressing the electricity and water issues at SUA? Can you make specific references to some documents?
5. What measures are in place to express the current loss in productivity and anticipated future loss due to electricity outages and water inadequacy?
6. Provide a concise report on the above

TERMS OF REFERENCE FOR JOHN BANZI, AGRICULTURAL RESEARCH AND DEVELOPMENT, MAFC

1. Provide a research staff list by highest qualification, by discipline (e.g. maize breeding), by age, by gender, by zone
2. Provide a listing of current research projects by type (e.g. horticulture breeding), by principal investigator, by gender of principal investigator, collaborating institutions per project, by zone, by amount of funding, by length of project and by source of funding
3. Provide a listing of publications from 2000 to date—by authors and title and where it is published. DO NOT INCLUDE REPORTS FOR THE MINISTRY OF AGRICULTURE
4. What are the incentives and disincentives for doing agricultural research in the Division?
5. What is the extent of research collaboration with SUA and other institutions? Can you provide some evidence?
6. What were the processes used in developing the Zonal Agricultural Research Priorities?
7. Provide a concise report on the above.

TERMS OF REFERENCE FOR MR GUNGU MIBAVU, PLANNING AND POLICY DEPARTMENT, MAFC

1. What are the key functions of the Policy and Planning Division?
2. What are the key skill requirements in the policy and planning division?
3. How many do we have now by sub-discipline, by highest qualification and gender and how many would be required?

4. What are the priorities –topical agricultural policy issues that need to be researched in Tanzania?
5. Provide a concise report on the above

TERMS OF REFERENCE FOR MS JUSTA KATUNZI, CROP DEVELOPMENT DIVISION, MAFC

1. Provide a two-page concise report on the current standing policy on extension in Tanzania—recruitment, placement and qualifications of those hired. Provide a gender aggregated data and provide a 10-year data
2. What is the relationship between research and extension? Differentiate between expected and actual!
3. Number of extension staff going for further training by discipline , by gender, by degree program and by year for the last 10 years
4. Where (exact employer) have the graduates gone by year by gender by discipline and by degree—1990 to 2010 upon their return?
5. Are there any tracer studies or (near tracer studies) of any type done from 1990 to date?—can we get the reports on these?
6. Give a listing of collaborative projects—research or otherwise among extension, research and Sokoine University of Agriculture.
7. Generally what and how are the incentive structures of the extension staff relative to those in the research?
8. Provide a 10-page concise report on the above excluding annexes

Annex B: Activity Calendar and Persons Consulted

17 August 2011

Morning: Meeting of Tanzania Meat Board (TMB)

- A. P. Njombe, Director of Animal Production and Marketing, Ministry of Livestock Development and Fisheries
- Susana M. Kiango, Registrar of the TMB
- Angello Mwilawa, Ph.D. student in Meat Science; National Livestock Research Institute
- Timothy Simalenga, Agricultural Research Council (South Africa)

Afternoon: Tanzania Chamber of Commerce, Industry, and Agriculture

- Isaac Dallushi: Vice President (Agriculture)
- M. Maranja, Chairman for Dar
- Magdalene Mkocho, Senior Chamber Development Officer

4:00 p.m.: Julius Wambura, FrabHo Enterprises

5:00 p.m.: Mboka Mwanitu (Policy Analyst, Agricultural Council of Tanzania)—Crawford

18 August 2011

8:00 a.m.: Ministry of Agriculture, Food Security and Cooperatives

Sophia E. Kaduma	Deputy PS	psk@kilimo.go.tz
Emmanuel M. Achayo	Director, Policy & Planning	dpp@kilimo.go.tz
Mary V. Temba	Ag. Dir. Admin. & Human Res.	mariatembo@yahoo.co.uk
Anne N. Assenga	Director of Training	d-training@hotmail.com
Karim Mtambo	Ag DNFS	Kmtambo04@yahoo.com
Rose Mbezi	Ag DLUP	psk@kilimo.go.tz
Ombaeli O. Lemwele	ADCMEW	lemweli@yahoo.com
Eng. Rajabu Mtunze	AD-APRE	Ngoma57@yahoo.com

2:30: USAID

- Kevin McCown (AOTR)
- David Nyange (Deputy FTF team leader)
- Maurice L. Shines (Economic Growth Officer)
- Stanslaus Materu, Lillian Mpinga, Asma Gharib (SUA/iAGRI graduate students)

19 August 2011

Morning: Travel to Morogoro

Lunch w/ David Kraybill

1:30: Gerald C. Monela, Vice Chancellor and Professor of Forest Economics

2:00: Amon P. Maerere, Deputy Director of Research and Post-Graduate Studies

2:30: Seminar by Steve Haggblade

4:00: Joyce Lyimo-Macha, Director, ICE

20 August 2011: work at hotel

9:00: Meeting with David Kraybill

11:00: Follow-up meeting among the needs assessment team

21 August 2011: Other activities; Departure of Haggblade

22 August 2011

9:00:

- Elibariki E. Msuya, Dept. of Agricultural Economics and Agribusiness (Minde, Crawford)
- Robert Mabagala, Dept. of Crop Science and Production
- Kallunde Sibuga: Weed science, and new Director of Quality Assurance (Colverson)
- Rebecca Hepelwa, M.Sc. student in soil science (Colverson)

10:00:

- Elibariki Msuya, cont. (Crawford)
- Cornel Rweyamamu, Head, Dept. of Crop Science and Production

11:00: Josephat Mtapu Principal Administrative Officer (Admissions)

11:15: George Mhagama, in charge of Human Resources and Services (estates, water/electricity, security)

2:15: Susan Nchimbi-Msolla: Deputy Director, Research and Publications

3:00: Fulgence J. Mishili, Dept. of Agricultural Economics and Agribusiness

4:00: Dominicus Komba, Estates Manager

6:00: Antoon Vergroesen, Technical Advisor, Private Agricultural Sector Support Trust (PASS)

23 August 2011

9:00: Vedasto R. M. Muhikambe, Director of Research and Postgraduate studies.

10:30: Peter Gillah, DVC (Academic)

11:30:

- Joyce Lyimo-Macha, Director, ICE (Colverson)
- Anna Temu, Dept. of Agricultural Economics and Agribusiness

12:30: Romanus C. Ishengoma, Coordinator of EPINAV; Faculty of Forestry & Nature Conservation

2:30: Ben P. Tiisekwa, Dean, Faculty of Agriculture; with Heads of Department

3:15:

- Frankwell W. Dulle, Associate Library Professor; Head, Periodicals; former Library Director (Minde and Crawford)
- Rachel Mshana, Assistant to Dean of Students, Counseling Center (Colverson)

24 August 2011

9:45: Shaaban B. Hoza, Principal, Morogoro Livestock Training Institute, Ministry of Livestock Development and Fisheries

11:00: Camilius Sanga, Head of IT Services.

Afternoon: Travel from Morogoro to Dar es Salaam

25 August 2011

10:00: Ministry of Ag, Food Security & Cooperatives. Present:

- E. Achayo, Director of Policy and Planning
- G. Kirenga, Director of Crop Development
- K. Mtambo, Acting Director, Department of Nutrition and Food Security
- R. Mbezi, Department of Land Use Planning
- Anne Assenga, Director of Training
- G. Mibavu, Department of Policy and Planning (task force member)
- J. Banzi, Directorate of Research and Development (task force member)
- J. Katunzi, Crop Development (task force member)
- A. Mrinji, Training (task force member)

3:00: Mlemba Abassy Kamwe, Socioeconomics and Demography Section, National Bureau of Statistics

Afternoon (Freed):

- Jon Halverson, AMMF Capital Management LLC
- Gebisa Ejeta, Purdue University

Afternoon (Colverson):

- Lillian Mapfa, Director, Human Resources, Min. Ag., Food Security & Cooperatives
- Mary Temba, Principal Officer, Human Resources, Min. Ag., Food Security & Cooperatives

Evening: Departure of Freed.

26 August 2011

- 9:00: Joyce Urassa, Agriculture Section, NBS (Minde and Crawford)
- Morning: Judy Laziye, Assistant Director, Ministry of Community Development, Gender and Children (Colverson)
- 2:30: Daniel Masolwa, National Accounts Section, NBS (Minde and Crawford)

27 August 2011: Departure of Colverson

28 August 2011: Departure of Crawford

4 September 2011: Return of Haggblade

5 September 2011

11:00: Moses Mkumbwa, Brewing Manager, Kibuku Ltd.

6 September 2011

9:00:

- Geoffrey Sabuni, Director of Assessment and Certification, VETA
- Enock Kibendela, Director of Labour Market, Planning and Development, VETA

2:00 p.m.: Alyosha Reilly, Managing Director, Interchick Company, Ltd.

7 September 2011:

- Agnes Mziray, CEO, National College of Tourism
- Eunice Ulomi, Director of Training, National College of Tourism

9 September 2011

Morning:

- Albina Chuwa, Director-General, National Bureau of Statistics
- William Mabusu, IT unit, National Bureau of Statistics

Evening: Departure of Haggblade

Annex C: Staffing at SUA and MAFC/NARS

Table C.1. Academic Staff Numbers at SUA, 2000/01 to 2010/11

YEAR	PROF.			ASS.PROF			SEN.LECT			LECT			ASST.LECT			TUT. ASSIST			OVERALL TOT.		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
2000/01	23	0	23	42	2	44	68	7	75	46	3	49	23	0	23	11	0	11	213	12	225
2001/02	26	0	26	44	3	47	63	5	68	39	7	46	28	0	28	7	0	7	207	15	222
2002/03	30	3	33	45	2	47	65	12	77	31	8	39	34	4	38	7	2	9	212	31	243
2003/04	30	3	33	53	4	57	55	11	66	43	7	50	46	6	52	10	1	11	237	32	269
2004/05	34	4	38	55	4	59	53	11	64	39	7	46	48	7	55	10	0	10	239	33	272
2005/06	43	4	47	54	2	56	61	14	75	37	9	46	43	7	50	13	0	13	251	36	287
2006/07	49	3	52	60	5	65	46	14	60	56	10	66	39	8	47	18	2	20	268	42	310
2007/08	50	5	55	61	7	68	51	11	62	62	7	69	48	11	59	12	6	18	284	47	331
2008/09	60	4	64	53	6	59	51	10	61	62	16	78	77	25	102	71	21	92	374	82	456
2009/10	65	4	69	51	7	58	52	11	63	63	14	77	79	31	110	70	19	89	380	86	466
2010/11	63	5	68	53	8	61	54	12	66	69	17	86	125	44	169	29	8	37	393	94	487

Table C.2 Academic Staff at SUA, by Department, as of September 2011

Faculty of Agriculture												
	PROF		ASS.PROF		SEN.LECT		LECT		ASST.LECT		TUT. ASSIST	
Department	M	F	M	F	M	F	M	F	M	F	M	F
Crop Science & Production	4	2	3	0	6	1	3	2	4	2	3	0
Animal Science Production	6	2	6	2	2	1	5	1	3	1	1	0
Agricultural Education & Extension	2	0	2	0	3	1	1	1	13	1	1	0
Soil Science	2	0	5	0	4	0	0	1	5	2	2	2
Agricultural Economics and Agribusiness	2	0	3	0	8	1	6	1	12	2	1	0
Food Science and Technology	6	0	4	2	1	2	3	5	5	6	1	2
Agricultural Engineering and Land Planning	1	0	10	0	3	0	2	0	5	0	2	0
TOTAL	23	4	33	4	27	6	20	11	47	14	11	4
Faculty of Forestry and Nature Conservation												
	PROF		ASS.PROF		SEN.LECT		LECT		ASST.LECT		TUT. ASSIST	
	M	F	M	F	M	F	M	F	M	F	M	F
Wood Utilization	4	0	2	0	0	1	0	0	1	0	0	0
Forest Biology	6	0	1	0	0	0	3	0	1	0	1	0
Forest Economics	1	0	2	0	1	0	2	1	1	0	0	0
Forest Mensuration and Management	2	0	1	0	4	0	1	0	0	0	0	0
Forest Engineering	2	0	3	0	1	0	0	0	1	0	1	0
Wildlife Management	0	0	3	0	2	0	4	1	8	3	1	0
TOTAL	15	0	12	0	8	1	10	2	12	3	3	0
Faculty of Veterinary Medicine												
	PROF		ASS.PROF		SEN.LECT		LECT		ASST.LECT		TUT. ASSIST	
	M	F	M	F	M	F	M	F	M	F	M	F
Veterinary Surgery and Theriogenology	6	0	1	0	0	0	2	2	1	0	0	0
Veterinary Microbiology and Parasitology	4	0	1	0	2	0	2	0	3	3	1	0
Veterinary Anatomy	2	0	0	0	2	0	1	0	1	0	0	0

Veterinary Physiology, Biochemistry, Pharmacology and Toxicology	5	1	1	0	2	0	0	0	4	1	1	0
Veterinary Medicine and Public Health	5	0	5	0	1	1	1	0	2	0	0	0
Veterinary Pathology	3	0	2	0	0	0	1	1	1	1	0	0
TOTAL	25	1	10	0	7	1	7	3	12	5	2	0
					Faculty of Science							
	PROF		ASS.PROF		SEN.LECT		LECT		ASST.LECT		TUT. ASSIST	
	M	F	M	F	M	F	M	F	M	F	M	F
Biological Sciences	0	0	1	1	1	0	3	0	5	2	0	0
Social Sciences	0	0	0	0	2	0	2	0	5	0	1	0
Biometry and Mathematics	0	0	0	0	1	0	4	1	6	5	4	0
Physical Sciences	0	0	0	0	2	0	6	1	9	4	1	0
Education	0	0	0	0	0	0	3	0	3	1	1	2
Informatics	0	0	0	0	0	0	0	1	3	0	0	0
TOTAL	0	0	1	1	6	0	18	3	31	12	7	2
					Institute/ Centre Directorate							
	PROF		ASS.PROF		SEN.LECT		LECT		ASST.LECT		TUT. ASSIST	
	M	F	M	F	M	F	M	F	M	F	M	F
SUA Pest Management Centre	2	0	0	0	1	1	2	0	0	0	0	0
Sokoine National Agricultural Library	0	0	2	1	3	1	2	1	5	1	0	0
SUA Centre for Sustainable Rural Development	0	0	0	0	3	0	2	0	0	0	0	0
Institute of Continuing Education	1	0	1	2	0	0	0	1	0	0	0	0
Computer Centre	0	0	0	0	0	0	2	0	2	0	0	0
Development Studies Institute	0	0	1	0	5	0	7	3	3	4	1	0
TOTAL	3	0	4	3	12	2	15	5	10	5	1	0
Total for All Departments	66	5	60	8	60	10	70	24	112	39	24	6
GRAND TOTAL	484											

Table C.3. Ministry of Agriculture, Food Security and Cooperatives, Researchers by Station, September 2011

S/NO	Name	Sex	Age	Highest Qualification	Discipline	Commodity	Station
4	George M.Iranga	MALE	55	MSc	Agronomy	Rice	Chollima-Dakawa
5	Joel A.Zakayo	MALE	52	MSc	Agronomy	Rice	Chollima-Dakawa
6	Ndimubandi E.Mvukie	MALE	48	MSc	Agronomy	Soils and Water Management	Chollima-Dakawa
1	Salum J .Mbegu	MALE	46	BSc	General Agriculture	Maize	Chollima-Dakawa
2	Didas R.Kimaro	MALE	34	BSc	Horticulture	Horticulture	Chollima-Dakawa
7	Hezron K.Tusekelege	MALE	51	MSc	Plant Breeding	Rice	Chollima-Dakawa
8	Charles J.Chuwa	MALE	41	MSc	Plant Pathology	Rice	Chollima-Dakawa
3	Daniel N.Chilosa	MALE	50	BSc	Seed Technology	Rice	Chollima-Dakawa
9	Demetria B .Nyambo	FEMALE	56	MSc	Soil Science	Soils and Water Management	Chollima-Dakawa
10	Thomas W. Ikjera	MALE	57	MSc	Soil Science	Soils and Water Management	Chollima-Dakawa
11	Thomas P.Kakema	MALE	57	MSc	Weed Science	Cereals (Rice,maize)	Chollima-Dakawa
14	John Linus Banzi	MALE	52	MSc	Agric.Economics	Planning Monitoring and Evaluation Unit	DRD HQ-DSM
15	Deogratias Nshoro Lwezaura	MALE	47	MSc	Agric.Economics	Planning Monitoring and Evaluation Unit	DRD HQ-DSM
22	George Anthony Sempheho	MALE	59	PhD	Agric.Economics	Planning Monitoring and Evaluation Unit	DRD HQ-DSM
12	Samwel Joseph Undule	MALE	48	BSc	Agric.Engineering	Planning Monitoring and Evaluation Unit	DRD HQ-DSM
16	Phillip Jacob Mbuligwe	MALE	47	MSc	Agric.Engineering	Special Programme Research Management	DRD HQ-DSM
13	Vidah Yosiah Mahava	FEMALE	42	BSc	Agric.Extension	Information Documentation Unit	DRD HQ-DSM
23	Elizabeth Johnson Maeda	FEMALE	51	PhD	Agric.Extension/policy	Farming System Research/Socio-Economics	DRD HQ-DSM
17	Eva Kilulele Kanyeke	FEMALE	57	MSc	Agronomy	Crop Research Management	DRD HQ-DSM
24	Fidelis Angelo Myaka	MALE	56	PhD	Agronomy	Research Management	DRD HQ-DSM
25	Gratian Rutabanzibwa Bamwenda	MALE	55	PhD	Environmental Sciences	Crop Research Management	DRD HQ-DSM
18	Barnabas Kapange	MALE	55	MSc	Information Sciences	Information Documentation Unit	DRD HQ-DSM
26	Janet Kaaya	FEMALE	54	PhD	Information Sciences	Information Documentation Unit	DRD HQ-DSM
27	Mary Shetto	FEMALE		PhD	Information Sciences	Farming System Research/Socio-Economics	DRD HQ-DSM
19	Ruth Kukogonyilwa Kamala	FEMALE	52	MSc	Plant Breeding	Crop Research Management	DRD HQ-DSM

20	Mary Herman Lutkamu	FEMALE	57	MSc	Soil Science	Special Programme Research Management	DRD HQ-DSM
21	Ninatubu Mathias Lema	MALE	59	MSc	Soil Science	Farming System Research/Socio-Economics	DRD HQ-DSM
28	Hussein Ahmed Mansoor	MALE	52	PhD	Soil Science	Crop Research Management	DRD HQ-DSM
29	Elias A. Letayo	MALE	51	MSc	Agronomy	Sorghum and Millet	HOMBOLO
30	Elirehema Y Swai	MALE	48	MSc	Soil Science	Soils and Water Management	HOMBOLO
31	Alice Michael Kavishe	FEMALE	49	BSc	Agronomy	Vegetables	HORTI-TENGERU
32	Mansuet Severin Tilya	MALE	49	BSc	Agronomy	Fruits	HORTI-TENGERU
39	Eric Joel Mhina	MALE	57	MSc	Agronomy	Agroforestry	HORTI-TENGERU
40	Ndeshi Simon Munisi	MALE	48	MSc	Agronomy	Vegetables	HORTI-TENGERU
43	Stephen Kuoko Sebastian	MALE	50	PhD	Agronomy	Potatoes	HORTI-TENGERU
41	Grace Victory Kindimba	FEMALE	32	MSc	Biotechnology	Banana	HORTI-TENGERU
33	Ruth Nzinyangwa Mnzava	FEMALE	44	BSc	Extension	Vegetables	HORTI-TENGERU
34	Aloyce Joseph Mosha	MALE	48	BSc	Extension	Vegetables	HORTI-TENGERU
35	Emmanuel Vicent Laswai	MALE	31	BSc	Plant Breeding	Vegetables	HORTI-TENGERU
36	Agatha Amnaay Aloyce	FEMALE	31	BSc	Plant protection	Mushroom	HORTI-TENGERU
37	Adeltruda Augustine Massawe	FEMALE	52	BSc	Plant Protection	Vegetables	HORTI-TENGERU
38	Yusuph Mohamed Ng'imba	MALE	29	BSc	Plant protection	Vegetables	HORTI-TENGERU
42	Silvest Njau Samali	MALE	51	MSc	Plant Protection	Vegetables	HORTI-TENGERU
44	Justine Alfred Mushi	MALE	51	BSc	Agric.Engineering		ILONGA
51	Lilian Jesse Mwanga	FEMALE	42	MSc	Agric.Extension		ILONGA
52	Onesmo Muta Ishumi	MALE	62	MSc	Agric.Extension		ILONGA
45	William Titus Sui	MALE	32	BSc	Agronomy		ILONGA
46	Abubakar Mshamu Mzanda	MALE	29	BSc	Agronomy		ILONGA
53	Adrian Banyenda Mbiza	MALE	54	MSc	Agronomy		ILONGA
54	Furaha Philemon Mrosso	MALE	44	MSc	Entomology		ILONGA
55	Zuberi Mohamed Bira	MALE	45	MSc	Food Technologist		ILONGA
56	Salvatory Theobald Kundi	MALE	49	MSc	Food Technologist		ILONGA
47	Christina Revocatus Kaswahili	FEMALE	29	BSc	Plant Breeding		ILONGA
48	Julius Sebastian Missanga	MALE	33	BSc	Plant Breeding		ILONGA

57	Michael Simbagije Robertson	MALE	40	MSc	Plant Breeding	ILONGA
58	Clecencia Edward Rutaihwa	FEMALE	56	MSc	Plant Breeding	ILONGA
64	Alfred Joseph Moshi	MALE	62	PhD	Plant Breeding	ILONGA
65	Joseph Kasian Mligo	MALE	60	PhD	Plant Breeding	ILONGA
59	Ernest Rashidi Mbega	MALE	34	MSc	Plant Pathology	ILONGA
60	Cornel Raphael Massawe	MALE	45	MSc	Plant Pathology	ILONGA
49	Victoria Lyidon Morungu	FEMALE	27	BSc	Socio-economics	ILONGA
50	Elisha Martine Mkandya	MALE	33	BSc	Socio-economics	ILONGA
61	Amos Chihambaya Chilagane	MALE	60	MSc	Socio-economics	ILONGA
62	Laurent Alphonse Kadenguka	MALE	54	MSc	Socio-economics	ILONGA
63	Hildellitha Berthold Msita	FEMALE	42	MSc	Soil Science	ILONGA
66	Chaboba Zaid Mkangwa	MALE	53	PhD	Soil Science	ILONGA
67	Mganga Joshua Kitilu	MALE	39	BSc	Agronomy	KATRIN- IFAKARA
69	Jerome Jonathan Mghase	MALE	43	MSc	Agronomy	KATRIN- IFAKARA
70	Theodore Theobald Kessy	MALE	40	MSc	Plant Breeding	KATRIN- IFAKARA
71	Nkori John Maregesi Kibanda	MALE	52	MSc	Plant Breeding	KATRIN- IFAKARA
68	Emanuel Mgonja	MALE	30	BSc	Plant Pathology	KATRIN- IFAKARA
72	Michael S.C. Mhosole	MALE	53	MSc	Soil Science	KIFYULILO
73	Emmanuel M. Kadogholo	MALE	40	MSc	Soil Science	KIFYULILO
74	Daines Sanga	FEMALE	32	BSc	Agronomy	MAKUTUPORA
75	Ismail M. Ngolinda	MALE	33	BSc	Agronomy	MAKUTUPORA
79	Leon K. Mrosso	MALE	48	MSc	Agronomy	MAKUTUPORA
76	Felista Joseph Mpore	FEMALE	35	BSc	Food Science	MAKUTUPORA
77	Badi Mwalim Bao*	MALE	31	BSc	Food Science	MAKUTUPORA
78	Dorah H Bivugile	FEMALE	26	BSc	General Agriculture	MAKUTUPORA
80	ELIZABETH PETER MPAYO	FEMALE	46	MSc	Plant Breeding	MAKUTUPORA
81	BAKARI D. MNDOLWA	MALE	50	MSc	Plant Breeding	MAKUTUPORA
82	Nuru J. Mgale	FEMALE	50	MSc	Plant Protection	MAKUTUPORA
83	Furaha J.K Majige	MALE	39	MSc	Plant Protection	MAKUTUPORA
84	Saada S. Hussein	FEMALE	43	MSc	Socio-economics	MAKUTUPORA
85	Elisha Bakuza William**	MALE	47	MSc	Socio-economics	MAKUTUPORA
86	George R. Budotela	MALE	56	MSc	Soil Science	MAKUTUPORA
87	Jojianas Kokulamka Kibura	FEMALE	47	BSc	Agric.Extension	MARUKU
90	Said R. Byabachwezi Mgenzi	MALE	50	MSc	Entomology	MARUKU
88	Ibrahim Hashim Mohamed	MALE	28	BSc	General Agriculture	MARUKU
91	Leonard George Mukandala	MALE	54	MSc	Plant Breeding	MARUKU

92	Eliawoni Festo Marandu	MALE	55	MSc	Plant Breeding		MARUKU
93	Madgalena Nchagwa William	FEMALE	50	MSc	Plant Pathology		MARUKU
94	Innocent Lawrence Ndyetabura	MALE	45	MSc	Plant Pathology		MARUKU
95	Cypridion Cyprian Mushongi	MALE	38	MSc	Socio-economics		MARUKU
96	Shafii Hussein Mndeme	MALE	34	MSc	Socio-economics		MARUKU
99	Jackson Madulu Nkuba	MALE	51	PhD	Socio-economics		MARUKU
89	Mpoki Mathew Shimwela	MALE	31	BSc	Soil Science		MARUKU
97	Mgeta Steven Merumba	MALE	38	MSc	Soil Science		MARUKU
100	Frederick Philbert Baijukya	MALE	45	PhD	Soil Science		MARUKU
98	Bulili Christopher Sayi	MALE	54	MSc	Zoology/botany		MARUKU
106	CHARLES MNZAVA PAUL	MALE	42	MSc	Agric.Economics	Coconut	MIKOCHENI
107	AHMED JUMA AHMED	MALE	62	MSc	Agric.Economics	coconut/grain legumes	MIKOCHENI
108	GRACE ALOYCE MSELE	FEMALE	33	MSc	Agric.Economics	Coconut	MIKOCHENI
101	FURAHINI SALIM HIZA	FEMALE	42	BSc	Agric.Extension	coconut	MIKOCHENI
109	JOYCE XAVERY CHALLE	FEMALE	50	MSc	Agricultural Sciences	Coconut	MIKOCHENI
110	NEWTON ABEL TEMU	MALE	59	MSc	Agriculture	Coconut	MIKOCHENI
111	RUTH BRUNO MADULU	FEMALE	56	MSc	Agronomy	Coconut	MIKOCHENI
112	ANDREW JACOB NGEREZA	MALE	51	MSc	Agronomy	Coconut	MIKOCHENI
119	GRACE SAMWEL CHIPUNGAHELO	FEMALE	61	PhD	Agronomy	coconut	MIKOCHENI
102	CATHERINE BURA GWANDU	FEMALE	29	BSc	Biotechnology	coconut/cassava/potato	MIKOCHENI
103	ANDREW ZEBEDAYO KACHIWILE	MALE	28	BSc	Biotechnology	coconut	MIKOCHENI
113	MICCAH SONGALAE SETH	MALE	37	MSc	Biotechnology	Coconut/maize	MIKOCHENI
114	GERADINA PANTALEO MZENA	FEMALE	34	MSc	Crop improvement	Coconut/cashew	MIKOCHENI
115	JULIUS ALLY MUGINI	MALE	49	MSc	Crop Protection	Coconut/banana	MIKOCHENI
120	ZUBERI SINGANO SEGUNI	MALE	58	PhD	Entomology	Coconut/mangoes/cashew	MIKOCHENI
116	MARIAM KOM MTUNGUJA	FEMALE	35	MSc	Food Processing	Coconut/sweet pptatoes	MIKOCHENI
104	SABAS ALOIS MOSHY	MALE	51	BSc	General Agriculture	Coconut	MIKOCHENI
105	AYOUB KIVURU NDEE	MALE	49	BSc	General Agriculture	Coconut	MIKOCHENI
121	RUTH RICHARD MINJA	FEMALE	49	PhD	Horticulture	Vegetables	MIKOCHENI
122	LINUS ISSAY MASUMBUKO	MALE	56	PhD	Plant Breeding	Coconut/coffee	MIKOCHENI
123	ALOIS KINANGA KULLAYA	MALE	59	PhD	Plant Breeding	Coconut/maize	MIKOCHENI
124	MOHAMED AHMED MSABAHA	MALE	61	PhD	Plant Breeding	Maize/coconut	MIKOCHENI
125	ANATOLIA ANTHONY MPUNAMI	FEMALE	57	PhD	Plant Pathology	coconut/rice	MIKOCHENI
126	JOSEPH CANISIUS NDUNGURU	MALE	47	PhD	Plant Pathology/virology	Cassava/potato	MIKOCHENI
127	FRED DONATI TAIRO	MALE	44	PhD	Plant Pathology/virology	Cassava/potato	MIKOCHENI
117	CHRISTOPHER LEONCE MATERU	MALE	51	MSc	Plant Protection (Pest mgt)	Coconut	MIKOCHENI
118	ZAKARIA EZEKIEL MUYENGI	MALE	38	MSc	Rural-economy	Coconut	MIKOCHENI
128	JUMA KAYEKE MOHAMED	MALE	50	PhD	Weed Science	Rice/sorghum	MIKOCHENI
129	Easther Elingiringa Ngowi	FEMALE	52	BSc	Agronomy		MLINGANO

130	Happyness Gabriel Mollel	FEMALE	27	BSc	Agronomy	MLINGANO
131	Charles Anselm Komba	MALE	40	BSc	Agronomy	MLINGANO
132	Eliangaringa Gerald Ngowi	MALE	56	BSc	Agronomy	MLINGANO
133	Essau Wawa Losujaki	MALE	26	BSc	Agronomy	MLINGANO
134	Charles Verdian Kassa	MALE	56	BSc	Electronics	MLINGANO
135	Beatrice Elingisanja Mlay	FEMALE	59	BSc	General Agriculture	MLINGANO
136	Laddy Aminiel Swai	FEMALE	52	BSc	General Agriculture	MLINGANO
140	Sophia Kashenge Kilengwa	MALE	39	MSc	General Agriculture	MLINGANO
137	Rita Ndunguru Ley	FEMALE	56	BSc	Socio-economics	MLINGANO
138	Samweli Julius Hizza	MALE	44	BSc	Socio-economics	MLINGANO
139	Eliambuya Geoffrey Sengoka	FEMALE	56	BSc	Soil Science	MLINGANO
141	Sibway Bakari Mwango	MALE	41	MSc	Soil Science	MLINGANO
142	Hamisi Shabani Katogolo	MALE	54	MSc	Soil Science	MLINGANO
143	Rufin Hassan Assenga	MALE	51	MSc	Soil Science	MLINGANO
144	Joseph David Mbogoni	MALE	50	MSc	Soil Science	MLINGANO
145	Juma Marwa Wickama	MALE	51	MSc	Soil Science	MLINGANO
146	Keneth Francis Masuki	MALE	44	MSc	Soil Science	MLINGANO
147	Joel Loitu Meliyo	MALE	46	MSc	Soil Science	MLINGANO
148	Godson Jessaya Urassa	MALE	45	MSc	Soil Science	MLINGANO
149	Catherine Justine Senkoro	MALE	48	MSc	Soil Science	MLINGANO
150	Susan Tingishaba Ikerra	FEMALE	57	PhD	Soil Science	MLINGANO
151	Matlida Charles Kalumuna	FEMALE	52	PhD	Soil Science	MLINGANO
152	Adolph Severine Nyaki	MALE	59	PhD	Soil Science	MLINGANO
153	George Jumaa Ley	MALE	58	PhD	Soil Science	MLINGANO
154	Atanasio Thomas Marandu	MALE	50	PhD	Soil Science	MLINGANO
155	Jeremias Gasper Mowo	MALE	57	PhD	Soil Science	MLINGANO
156	Happy Makuru Daudi	FEMALE	27	BSc	Agronomy	NALIENDELE
157	Zakaria Kalesa Mbunda	MALE	57	BSc	Agronomy	NALIENDELE
158	Juma Rashid Chijinga	MALE	58	BSc	Agronomy	NALIENDELE
159	Athanas Joseph Minja	MALE	31	BSc	Agronomy	NALIENDELE
167	Ramadhan Ayub Bashiru	MALE	51	MSc	Agronomy	NALIENDELE
173	Louis John Kasuga	MALE	55	PhD	Agronomy	NALIENDELE
174	Elly Minani Kafiriti	MALE	56	PhD	Agronomy	NALIENDELE
175	Emmarold Eliuforo Mneney	MALE	56	PhD	Biotechnology	NALIENDELE
176	Geoffrey Suleiman Mkamilo	MALE	46	PhD	Crop Ecology	NALIENDELE
160	Muhajir Mussa Kwikima	MALE	25	BSc	Environmental Science	NALIENDELE
161	Juma Rashid Mfaume	MALE	42	BSc	Plant Breeding	NALIENDELE
162	Aloyce Calist Kundy	MALE	39	BSc	Plant Breeding	NALIENDELE
163	Mashamba Lucas Philipo	MALE	32	BSc	Plant Breeding	NALIENDELE
168	Fortunus Anton Kapinga	MALE	48	MSc	Plant Breeding	NALIENDELE

177	Omari Kalanje Mponda	MALE	51	PhD	Plant Breeding	NALIENDELE
178	Peter Albert Masawe	MALE	53	PhD	Plant Breeding	NALIENDELE
164	Halfan Hamisi Nene	FEMALE	32	BSc	Plant Pathology	NALIENDELE
179	Mark Elijah Sijaona	MALE	57	PhD	Plant Pathology	NALIENDELE
165	Joane Louis Kasuga	FEMALE	56	BSc	Plant Protection	NALIENDELE
166	Davis Fabian Mwakanyamale	MALE	35	BSc	Socio-economics	NALIENDELE
169	Bakari Rashid Kidunda	MALE	34	MSc	Socio-economics	NALIENDELE
170	Bernard Masanja Shija	MALE	39	MSc	Socio-economics	NALIENDELE
171	John Gasper Tenga	MALE	43	MSc	Soil Science	NALIENDELE
172	Andrew Kaggwa Kabanza	MALE	44	MSc	Soil Science	NALIENDELE
186	Jeremia Solomon Sembosi	MALE	55	MSc	Agric.Extension	SELIAN
187	Charles Joseph Lyamchai	MALE	55	MSc	Agrometeorology	SELIAN
180	Eutropia Vicent Tairo	FEMALE	30	BSc	Agronomy	SELIAN
181	Wilfred L.E.S. Mariki	MALE	56	BSc	Agronomy	SELIAN
188	Tuaeli Emil Mmbaga	MALE	57	MSc	Agronomy	SELIAN
189	John Wilfred Julius Msacky	MALE	50	MSc	Agronomy	SELIAN
190	Kheri Msabaha Kitenge	MALE	52	MSc	Agronomy	SELIAN
204	Peter Rasiaeli Matowo	MALE	57	PhD	Agronomy	SELIAN
205	Mboyi Lukas Mugendi	MALE	54	PhD	Agronomy	SELIAN
191	Marcelina Gadiel Minja	FEMALE	46	MSc	Animal Science	SELIAN
192	Bashiri Rashidi Makoko	MALE	53	MSc	Crop Science	SELIAN
193	Lameck Makoye Nyaligwa	MALE	41	MSc	Crop Science	SELIAN
194	Simon Bura Slumpa	MALE	54	MSc	Entomology	SELIAN
195	John Elias Saria	MALE	46	MSc	Entomology	SELIAN
182	Antipas Patric Bwakila	MALE	46	BSc	General Agriculture	SELIAN
196	Sostine Onesmo Kweka	MALE	54	MSc	Plant Breeding	SELIAN
197	Ibrahim Ndekurusa Mamuya	MALE	49	MSc	Plant Breeding	SELIAN
206	Catherine Albert Kuwite	FEMALE	57	PhD	Plant Pathology	SELIAN
183	Upendo Frederick Titi	FEMALE	31	BSc	Socio-economics	SELIAN
184	Shadrack Jacob Mbapila	MALE	29	BSc	Socio-economics	SELIAN
198	Theresia Leopald Gregory	FEMALE	48	MSc	Socio-economics	SELIAN
199	Rose Matiko Ubwe	MALE	38	MSc	Socio-economics	SELIAN
200	Priscilla Gabriel Mng'anya	FEMALE		MSc	Socio-economics	SELIAN
201	Frank Elly Mmbando	MALE	39	MSc	Socio-economics	SELIAN
185	Prosper Inyasi Massawe	MALE	30	BSc	Soil Science	SELIAN
202	Ramadhani Thabit Ngatoluwa	MALE	49	MSc	Soil Science	SELIAN
203	Ignace Kirango Kullaya	MALE	58	MSc	Soil Science	SELIAN
207	Fridah Mbazi Mgonja	FEMALE	55	PhD	Weed Science	SELIAN
208	MINZA. MULYANDINGU MASUNGA	FEMALE	31	BSc	Agronomy	SRI-KIBAHA
209	HERMAN FRANCIS KALIMBA	MALE	48	BSc	Agronomy	SRI-KIBAHA

219	DENIS WILLIAM ISA	MALE	51	PhD	Agronomy	SRI-KIBAHA
213	NTULI LA SWILA	FEMALE	41	MSc	Entomology	SRI-KIBAHA
214	MARTON JAPHET MUHANNA	MALE	52	MSc	Entomology	SRI-KIBAHA
220	NESSIE DIETRICH LUAMBANO BERNADETHA PENDAMALI	FEMALE	38	PhD	Nematology	SRI-KIBAHA
210	KIMATA	FEMALE	47	BSc	Plant Breeding	SRI-KIBAHA
211	KAROLINE LEONARD SICHALWE	FEMALE	31	BSc	Plant Breeding	SRI-KIBAHA
215	Esther Andrew Masumba	FEMALE	48	MSc	Plant Breeding	SRI-KIBAHA
221	KIDDO JULIUS MTUNDA	FEMALE	49	PhD	Plant Breeding	SRI-KIBAHA
222	Jeremia Mathew Haki	MALE	63	PhD	Plant Breeding	SRI-KIBAHA
212	FLORIAN BUBERWA BOMBO	MALE	39	BSc	Socio-economics	SRI-KIBAHA
216	BAKARI JOHN MSEMO	MALE	42	MSc	Socio-economics	SRI-KIBAHA
217	GRACE MSELLE ALOYCE	FEMALE	32	MSc	Socio-economics	SRI-KIBAHA
218	STEPHAN ELIUTH NGAILO	MALE	40	MSc	Soil Science	SRI-KIBAHA
223	Samweli Erasto Kazyoba	MALE	39	BSc	Agric.Extension	TUMBI
224	Asheri Mwamba Kalala	MALE	37	BSc	Agronomy	TUMBI
225	John Lobulu Loatha	MALE	32	BSc	Agronomy	TUMBI
230	Deusdedit Antony Byamungu	MALE	45	MSc	Agronomy	TUMBI
231	Justine Hanson Ringo	MALE	35	MSc	Biotechnology Environmental Management	TUMBI
232	Peter Zedekia Matata	MALE	51	MSc	Environmental Science	TUMBI
226	Amri Swaib Yusuf	MALE	27	BSc	General Agriculture	TUMBI
227	Filson Mbezi Kagimbo	MALE	31	BSc	Land Use Management	TUMBI
233	Benedict Bernard Msilanga	MALE	48	MSc	Plant Breeding	TUMBI
234	Tulole Lugendo Bucheyeki	MALE	46	MSc	Plant Breeding	TUMBI
235	Atugonza Luta Bilaro	MALE	38	MSc	Socio-economics	TUMBI
228	Nocholaus Msimu Kuboja	MALE	37	BSc	Socio-economics	TUMBI
229	Leah William Matata	FEMALE	45	MA	Socio-economics	TUMBI
236	Jonathan Ernest Chiligati	MALE	50	MSc	Soil Science	TUMBI
237	Erasto Mbulinge Shenkalwa	MALE	59	MSc	Soil Science	TUMBI
238	Fabian Mwoshezi bagarama	MALE	54	MSc	Soil Science	TUMBI
239	Frank G Lyimo	MALE	40	BSc	Agric.Extension	UKIRIGURU
269	Geofrey Jasper Kajiru	MALE	50	PhD	Agricultural Water Mgt	UKIRIGURU
254	Hilda Sagondi Ngazi	FEMALE	54	MSc	Agroforestry	UKIRIGURU
240	Habai Raphael Masunga	MALE	32	BSc	Agronomy	UKIRIGURU
241	Joseph S Joachim	MALE	28	BSc	Agronomy	UKIRIGURU
242	Theodorothadei Mtobesya Kurwijila	MALE	43	BSc	Agronomy	UKIRIGURU
243	Kasele Salum Feruzi	MALE	32	BSc	Agronomy	UKIRIGURU
255	Mariana Hermes Massawe	FEMALE	44	MSc	Agronomy	UKIRIGURU
256	Robert Onyari Kileo	MALE	51	MSc	Agronomy	UKIRIGURU

257	Donald Gervas Sayi	MALE	46	MSc	Agronomy	UKIRIGURU
244	Abdullah M Mkiga	MALE		BSc	Entomology	UKIRIGURU
258	Epifania Elias Temu	FEMALE	49	MSc	Entomology	UKIRIGURU
245	Highnes Simon Msuya	FEMALE	41	BSc	Environmental Management	UKIRIGURU
246	Agnes Alphonse Kapingu	FEMALE	44	BSc	Environmental Management	UKIRIGURU
247	Rahila M Amour	FEMALE	41	BSc	Environmental Management	UKIRIGURU
248	Caresma J Chuwa	FEMALE	32	BSc	Food Science & Technology	UKIRIGURU
249	Seperatus Pascal Kamuntu	MALE	46	BSc	General Agriculture	UKIRIGURU
250	Zakayo A Machunde	MALE	31	BSc	General Agriculture	UKIRIGURU
251	Rashid Kiloh Lusewa	MALE	51	BSc	Plant Breeding	UKIRIGURU
252	Stella G Chirimi	FEMALE	52	BSc	Plant Breeding	UKIRIGURU
259	Ottavina Said Ramadhani	FEMALE	58	MSc	Plant Breeding	UKIRIGURU
260	Peter Kiyabo Kapingu	MALE	59	MSc	Plant Breeding	UKIRIGURU
261	Ignath Hildeus Rwiza	MALE	59	MSc	Plant Breeding	UKIRIGURU
270	Heneriko Philbert Kulembeka	MALE	46	PhD	Plant Breeding	UKIRIGURU
271	Everina Jovitta Lukonge	FEMALE	48	PhD	Plant Breeding	UKIRIGURU
272	Tryphon Henry Kibani	MALE	58	PhD	Plant Pathology	UKIRIGURU
262	Simon Cephas Jeremiah	MALE	50	MSc	Plant Protection	UKIRIGURU
263	Theresia Ally Ngendello	FEMALE	45	MSc	Post Harvest	UKIRIGURU
253	William Kifai Mongi	MALE	55	BSc	Socio-economics	UKIRIGURU
264	Adventina Kaino Babu	FEMALE	48	MSc	Socio-economics	UKIRIGURU
265	George Barnabas Sonda	MALE	37	MSc	Socio-economics	UKIRIGURU
273	January Mlona Mafuru	MALE	52	PhD	Socio-economics	UKIRIGURU
266	Deus Peter Mlay	MALE	38	MSc	Soil Science	UKIRIGURU
267	Fidelis Bachubira Kaihura	MALE	58	MSc	Soil Science	UKIRIGURU
268	Elmens Lutaleka Kaboni	MALE	47	MSc	Soil Science	UKIRIGURU
293	Said Sefu Mkomwa	MALE	56	MSc	Agric.Engineering	UYOLE
274	Leonard Mhoja Sibula	MALE	29	BSc	Agronomy	UYOLE
275	Reinfrid Martin Maganga	MALE	29	BSc	Agronomy	UYOLE
276	Dennis Erro Tippe	MALE	29	BSc	Agronomy	UYOLE
277	Mohamed Kaimu Mzimhiri	MALE	50	BSc	Agronomy	UYOLE
278	Rehema Ole Seenga	FEMALE	44	BSc	Agronomy	UYOLE
294	Dorah Highness Mende	FEMALE	46	MSc	Agronomy	UYOLE
295	Raymond Mgaza Kambi Mghogho	MALE	59	MSc	Agronomy	UYOLE
296	Anderson Elibariki Temu	MALE	59	MSc	Agronomy	UYOLE
297	Mary Cassian Njau	FEMALE	29	MSc	Agronomy	UYOLE
279	Evangelista I.Chiunga	FEMALE	27	BSc	Biotechnology	UYOLE

298	Japhet Lujabiko Kihupi	MALE	58	MSc	Community Development	UYOLE
280	Biles Luka Nzilano	FEMALE	44	BSc	Enviromental Sciences	UYOLE
281	Emmanuel A.Chilagane	MALE	25	BSc	General Agriculture	UYOLE
282	Remmy Raphael Mwakimbwala	MALE	51	BSc	General Agriculture	UYOLE
283	Aida Alex Magelanga	FEMALE	44	BSc	General Agriculture	UYOLE
284	Winfrida Niwabilenga Tegambwage	FEMALE	56	BSc	General Agriculture	UYOLE
285	Esther Elisafisha Meela	FEMALE	58	BSc	Horticulture	UYOLE
286	Owekisha Harmas Kwizigile	MALE	31	BSc	Horticulture	UYOLE
287	John K.Kigwinya	MALE	31	BSc	Horticulture	UYOLE
288	Daud Batson Mbongo	MALE	34	BSc	Horticulture	UYOLE
289	Juma Anderson Matonya	MALE	35	BSc	Horticulture	UYOLE
299	William Nicholas Mmari	MALE	36	MSc	Natural Resources Mgt	UYOLE
300	Ndebhemeye Mlengeri Kabharu	MALE	40	MSc	Natural Resources Mgt	UYOLE
290	Anthony Masige Elanga	MALE	54	BSc	Plant Breeding	UYOLE
301	Mary Amos Ndimbo	FEMALE	48	MSc	Plant Breeding	UYOLE
302	Rose John Mongi	FEMALE	49	MSc	Plant Breeding	UYOLE
303	Anorld Angelo Mushongi	MALE	40	MSc	Plant Breeding	UYOLE
304	Michael Andrea Kilango	MALE	41	MSc	Plant Breeding	UYOLE
305	Benjamin G.Kiwovele	MALE	51	MSc	Plant Breeding	UYOLE
306	Deogratias Bernard Kisandu	MALE	54	MSc	Plant Breeding	UYOLE
316	Catherine Sylvester Madata	FEMALE	59	PhD	Plant Breeding	UYOLE
317	Barnabas Anthony Kiula	MALE	57	PhD	Plant Breeding	UYOLE
307	Frederica Mlekio Shao Mwalyego	FEMALE	58	MSc	Plant pathology	UYOLE
291	Anna Mkiro Mrema	FEMALE	53	BSc	Socio-economics	UYOLE
292	Lilian Wilfred Ntamahungilo	FEMALE	53	BSc	Socio-economics	UYOLE
308	Kissa Tulibonywa Mwaisoba	FEMALE	30	MSc	Socio-economics	UYOLE
309	Sophia Faustin Swai	FEMALE	37	MSc	Socio-economics	UYOLE
310	Agnes Alex Ndunguru	FEMALE	40	MSc	Socio-economics	UYOLE
311	Catherine David Kabungo	FEMALE	48	MSc	Socio-economics	UYOLE
312	Juliana Andagile Mwakasendo	FEMALE	40	MSc	Socio-economics	UYOLE
313	Pricilla Babtista Mbwaga	FEMALE	48	MSc	Soil Science	UYOLE
314	Jerry Alfred Ngailo	MALE	50	MSc	Soil Science	UYOLE
318	Zakaria John Umbet Malley	MALE	51	PhD	Soil Science	UYOLE
315	David Anania Kabungo	MALE	53	MSc	Zoology	UYOLE

Total researchers = 318, of which 223 (70%) are male and 95 (30%) are female

Totals by discipline:

Agronomy	63	Biotechnology	7	Crop Science	2
Plant Breeding	49	Horticulture	7	Environmental Sciences	2
Soil Science	44	Agric.Economics	6	Environmental Science	2
Socio-economics	37	Agric.Engineering	4	Extension	2
General Agriculture	16	Environmental Management	4	Food Science	2
Plant Pathology	12	Information Sciences	3	Food Technologist	2
Entomology	9	Weed Science	3	Natural Resources Mgt	2
Agric.Extension	8			Plant Pathology/virology	2

1 each for: Agric.Extension/policy, Agricultural Sciences, Agricultural Water Mgt, Agriculture, Agroforestry, Agrometeorology, Animal Science, Community Development, Crop Ecology , Crop improvement, Crop Protection, Electronics, Food Processing, Food Science & Technology, Land Use Management, Nematology, Plant Protection (Pest mgt), Post Harvest , Rural-economy, Seed Technology, Zoology, Zoology/botany

Annex D: Sources of Funds for SUA

Table D.1. Sources of Funds for SUA, 2001/02 to 2010/11

(Tanzania Shillings)

Year	Government	Donor	SUA/Internal-Generated Income	Total
2001/2002	9,011,742,871	2,900,790,841	60,060,000	11,972,593,712
2002/2003	10,159,233,217	3,151,954,987	77,497,000	13,388,685,204
2003/2004	11,007,795,469	4,141,154,987	82,611,448	15,231,561,904
2004/2005	11,171,056,315	4,447,904,454	258,424,726	15,877,385,495
2005/2006	11,201,872,000	5,135,151,000	244,794,766	16,581,817,766
2006/2007	16,085,304,004	5,343,442,325	307,412,579	21,736,158,908
2007/2008	16,598,129,999	5,691,339	2,504,728,762	19,108,550,100
2009/2010	23,823,954,700	16,981,247,000	6,423,903,481	47,229,105,181
2010/2011	25,185,435,720	17,547,906,896	9,638,581,333	42,733,342,616
2011/2012*	28,237,104,429	23,258,632,250	10,639,168,684	62,134,905,363

(Source: H. Sanga)

*These numbers may be higher by the end of the year 2011-2012 if government and donors fulfill their pledges/obligations.

Factors behind the increase of the budget from 2008/2009 to 2010/2011:

- The large increase in donor funding in 2009/2010 was associated with disbursements related to the NORAD-funded university-wide research programs (CCIM and EPINAV).
- A big increase of student enrollment from about 1,900 first-year students in 2009/2010 to about 2,952 first-year students in 2010/2011 attracted more funds from Higher Education Students Loan Board (HESLB).
- SUA recruited more academic and administrative staff progressively from 2008/09, reaching 1,500 in 2010/11, of which about 960 are administrative and about 640 are academic staff. The number of academic staff increased from 489 in financial year 2009/10 to 640 in 2010/11.
- Salary increase during financial year 2010/11 for about 1,500 SUA staff.

Annex E: Organizational Structure of SUA

Table E.1. SUA Leadership

I. Top leadership positions		
	Name	Gender
1. CHANCELLOR	Hon. Al noor Kassum	M
2. VICE CHANCELLOR	Prof. Gerald. C. Monela	M
3. DEPUTY VICE CHANCELLOR (Academic)	Prof. Peter .R. Gillah	M
4. DEPUTY VICE CHANCELLOR (Administration & Finance)	Prof. Jairos A. Matovelo	M
II. Deans and Associate Deans		
A. Faculty of Agriculture		
1. Dean	Prof. B. P. Tiisekwa	M
2. Deputy Dean (Academic):	Dr. Abeli K. Kaaya	M
3. Deputy Dean (Admin)	Prof. S. Mpaduji	M
B. Faculty of Forestry & Nature Conservation		
1. Dean	Prof. Y.M. Ngaga	M
2. Deputy Dean	Prof. G. A. Migunga	M
C. Faculty of Veterinary Medicine		
1. Dean	Prof. P. N. Wambura	M
2. Deputy Dean	Prof. M.M.A. Mtambo	M
D. Faculty of Science		
1. Dean	Prof. P.L. Mwang'ingo	M
2. Deputy Dean	Dr. G. K. Karugila	M
A. Students' Administration		
Dean of Students:	Mr. P.J. Motshabi	M
III. Directors and Deputy Directors of Directorates, Institutes and Centers.		
A. Directorate of Research & Postgraduate Studies		
1. Director:	Prof. V.R.M. Muhikambebe	M
2. Deputy Director (Postgraduate Studies):	Prof. A.P. Maerere	M
3. Deputy Director(Research)	Prof. S. Nchimbi-Msolla	F
B. Directorate of Solomon Mahlangu Campus		
1. Director:	Prof. Y.C. Muzanila	F
2. Deputy Director:	Dr. Fredrick Kahimba	M
C. Sokoine National Agricultural Library		
1. Director:	Prof.(Mrs.) D. S. Matovelo	F
2. Deputy Director:	Prof. M.J.F. Lwehabura	M

D. Computer Centre		
1. Director:	Dr. W.R.W Ballegu	M
2. Deputy Director	Dr. L.S.P Busagala	M
E. SUA Centre for Sustainable Rural Development		
1. Director:	Dr. D Mwaseba	M
2. Deputy Director:	Dr. Christopher Mahonge	M
F. SUA Pest Management Centre		
1. Director	Prof. R.H.Makundi	M
2. Deputy Director:	Dr. Apia W.Massawe	F
G. Development Studies Institute		
1. Director:	Dr. J.S. Mbwambo	M
2. Deputy Director:	Dr. C. Nombo	F
H. Institute of Continuing Education		
1. Director:	Prof. J.G. Lyimo-Macha	F
2. Deputy Director	Dr. A. S. Sife	M
Heads of Departments		
Faculty of Agriculture		
Department of Animal Science & Production	Dr. Beno V. Mnembuka	M
Department of Food Science & Technology	Prof. E. Chove	M
Department of Agricultural Education & Extension	Dr. C. P. Msuya Bengesi	F
Department of Agricultural Engineering & Land Planning	Prof. Valerian C. K. Silayo	M
Department of Crop Science & Production	Dr.C. L. Rweyemamu	M
Department of Soil Science	Prof. F. B. R. Rwehumbiza	M
Department of Agricultural Economics & Agribusiness	Dr. Damas Phillip	M
Faculty of Forestry & Nature Conservation		
Department of Forest Biology	Prof. Ruwa-Aichi P. C Temu	M
Department of Forest Engineering	Dr. D. S. A. Silayo	M
Department of Forest Economics	Prof. John F. Kessy	M
Department of Forest Mensuration & Management:	Prof. Emmanuel J. Luoga	M
Department of Wood Utilization	Prof. F. B. Makonda	M
Department of Wildlife Management	Prof. A. N. Songorwa	M

Faculty of Veterinary Medicine		
Department of Veterinary Medicine & Public Health:	Prof. L. S. B. Mellau	M
Department of Veterinary Surgery & Theriogenology	Prof. S. B. P. Bittegeko	M
Department of Veterinary Microbiology & Parasitology	Prof. E. N. Kimbita	M
Department of Veterinary Physiology, Pharmacology, Biochemistry & Toxicology	Prof. E. C. J. H. Phiri	M
Department of Veterinary Pathology	Prof. Joshua J. Malago	M
Department of Veterinary Anatomy	Dr. C.D. Luziga	M
Faculty of Science		
Department of Physical Sciences	Dr. I. C. Mjema	M
Department of Social Sciences	Dr. M. Hashim	M
Department of Biological Sciences	Dr. A.L. Malisa	M
Department of Mathematics & Biometry	Dr. G. K. Karugila	M
Section Socio- Economics	Dr. D. Mhando	M
Section Resource Management	Dr. C. Mahonge	M

Annex F: NARS Research Programs and Outputs

Table F.1. DRD Collaborative Research Projects with SUA and Other Institutions

Type of collaboration	Name of Institution	Targeted beneficiaries	Year	Output/outcome/impact of collaboration
Integrated management of major insect pests and diseases of cashew in East and Western Africa.	ICIPE and ARI-Naliendele	Cashew growers	2009 – 2012	<ul style="list-style-type: none"> - Effects of landscape and habitat management on diversity, abundance and population dynamics of key cashew pests and beneficial were investigated.
Intercropping of Lethal disease (LD) tolerant EAT ex Tanga sub-populations with other tree crops as a stop gap measure to counteract LD in Coast and Tanga regions.	DALDO (Tanga) and DALDO (Bagamoyo)	Small scale coconut farmers		<ul style="list-style-type: none"> - Participating farmers in the trial districts have been supplied with suitable planting materials.
Introducing IPM strategies for sustainable and environment friendly fruit fly control on smallholder mango orchards in Coast and Dar Es Salaam regions.	DALDO (Mkuranga) and DALDO (Ilala)	Smallholder mango farmers	2010 – 2013	<ul style="list-style-type: none"> - IPM technologies for fruit fly control were successfully introduced and practised by more than 200 Farmer's field school farmers in 8 villages of Mkuranga and Ilala districts.
Promotion of orange fleshed sweet potato (OFSP) for increased household incomes and improved nutrition of the rural poor in Muheza and Mkuranga districts of the Eastern Tanzania.	DALDO (Mkuranga) and DALDO (Muheza)	Sweet potato farmers	2009 -2011	<ul style="list-style-type: none"> - Increased income of households. - Adoption of OFSP growing - Improved nutrition in the farming communities.
Multiplication of Tanzanian grape varieties through tissue culture.	ARI-Makutupora	Small scale grape farmers	2010-2012	<ul style="list-style-type: none"> - Micro-propagation of Tanzanian grape varieties by tissue culture

Type of collaboration	Name of Institution	Targeted beneficiaries	Year	Output/outcome/impact of collaboration
Improving Phosphorus supply and availability in organic farming systems.	ARI –Uyole DALDO – Mbeya	Organic vegetable farmers	2009-2011	<ul style="list-style-type: none"> - The supply and availability of Phosphorus has improved. - Yield of different vegetable crops was also improved.
Processing for commercial exploitation of selected tree-fruits and vegetables in Tanzania and Rwanda.	Sokoine University, Community Food Processing and training Center, Kigali Institute of Science and Technology and Institute for scientific research of Rwanda	Small scale processors	2009-2011	<ul style="list-style-type: none"> - Enabling policies for enhanced fruits and vegetables processing and marketing were facilitated.
Enhancing Capacity of national Cassava research Programs to diagnose, characterise, monitor and sustainably manage viruses affecting cassava productivity.	KARI (Kenya), IIAM-Mozambique, ZARI (Zambia), ASAR– Rwanda, CARS-Malawi and NACRRI (Uganda).	Cassava growers	2009-2011	<ul style="list-style-type: none"> - Cassava viruses has been identified in all project countries - Diagnostic laboratories have been established in all project countries - National cassava virus disease diagnostic capacity has been significantly enhanced - A network of scientists in the national programs has been established. - Disease prevalent maps have been generated.
Sweet potato action for security and health in Africa (SASHA)	International Potato Center , BECA, Central science, York (UK), and Natural Resource Institute UK)	Molecular virologists/ sweet potato farmers	2010 – 2012	<ul style="list-style-type: none"> - A Post-doc molecular virologist has been recruited. - Training on serological and molecular diagnostics was conducted in Kenya.

Type of collaboration	Name of Institution	Targeted beneficiaries	Year	Output/outcome/impact of collaboration
Developing community based low cost Tissue culture incubators in East and Central Africa.	Jomo Kenyatta University, NARO (Uganda)	Tissue culture operators	2011	<ul style="list-style-type: none"> - Enhanced utilisation of high quality tissue culture planting materials for banana, potato and cassava. - Establishment of incubation centres in partnership with community based private sector.
Enhancing food security through improved seed systems and varieties of cassava, potato, and sweet potato resilient to climate change in Eastern Africa.	KAZARDI (Uganda), Addis Ababa University, KARI (Kenya), ISAR (Rwanda), and Makerere University.	Cassava and sweet potato farmers	2011-2013	<ul style="list-style-type: none"> - The project has just started
Evaluation and delivering new sorghum and finger millet innovations for food security and improving livelihoods in Eastern Africa.	Addis Ababa University, KARI (Kenya), ISAR (Rwanda) and Makerere University.	Sorghum and finger-millet growers	2011 -2013	<ul style="list-style-type: none"> - The project has just started
Morphological and molecular characterization of sorghum hybrids for tolerance to drought and acid soils of Tanzania.	Moi University and ICRISAT	Sorghum farmers	2010- 2012	<ul style="list-style-type: none"> - Soil characterization of project sites completed. - Germplasm collected from Moi University and ICRISAT - The project has just started.

Table F.2. DRD On-Going Research Projects

No	Project Title	Discipline of project focus	Principal Investigator	Gender	Highest Degree	Year Started	Planned Completion Date	Approved budget	Source of funds
1	Introduction of improved high yielding maize varieties in Kigoma and Tabora Regions	Maize breeding	T.L. Bucheyeki	M	MSC			Tshs 30,000,000	ASDP-ZARDEF
2	Improving household food security and incomes through introduction of fertilizer trees in maize production in Kasulu and Kigoma rural districts	Agricultural economics	N.K. Musimu	M	MSC			Tshs 30,000,000	ASDP-ZARDEF
3	Introduction of improved avocado and passion varieties among smallholder farmers in Kigoma highlands for income and nutrition status improvement	Agricultural economics	N.K. Musimu	M	MSC			Tshs 30,000,000	ASDP-ZARDEF
4	Investigating farmers perceptions and prevalence of contagious Caprice Pleuropneumonitis (CCPP) in Nzega Sikonge and Tabora districts	Verterinary medicine	J.E. Mghwira	M	MPVM			Tshs 30,000,000	ASDP-ZARDEF
5	Community participation in the Promotion and development of Odour-baited traps for the control of Trypanosomiasis in Kigoma and Tabora regions, Tanzania	Applied zoology	W. Kitwika	M	MSC			Tshs 30,000,000	ASDP-ZARDEF
6	Promoting the use of thermostable I-2 vaccine in controlling Newcastle Disease in free Range Local chickens -In Uyui and Kigoma Rural Districts	Verterinary medicine	P.R.Fupi	M	BVM			Tshs 30,000,000	ASDP-ZARDEF
7	Control of leafminer on vegetables	vegetable protection	Adeltruda Massawe	F	BSc	2010	2012	Tshs 40,000,000	ICIPE
8	Seed production of AIVs	Indigenous vegetables production	Silvest N.Samali	M	MSc	2009	2012	Tshs 50,000,000	ASARECA
9	Promotion of passion fruits	Fruits production	Ndeshi Munisi	F	MSc	2011	2013	Tshs 30,000,000	ZARDEF
10	Introduction of temprate fruits	Fruits production	Nancy Kaaya	F	MSc	2011	2013	Tshs 30,000,000	ZARDEF
11	Control of leafminer on vegetables	vegetable protection	Adeltruda Massawe	F	BSc	2010	2012	Tshs 40,000,000	ICIPE
12	Seed production of AIVs	Indigenous vegetables production	Silvest N.Samali	M	MSc	2009	2012	Tshs 50,000,000	ASARECA
13	Promotion of passion fruits	Fruits production	Ndeshi Munisi	F	MSc	2011	2013	Tshs 30,000,000	ZARDEF
14	Introduction of temprate fruits	Fruits production	Nancy Kaaya	F	MSc	2011	2013	Tshs 30,000,000	ZARDEF

15	Evaluation of the advanced rice lines for release to the farmers in the Southern highlands of Tanzania	Rice	Deogratias B. Kisandu	M	MSc	2009	11-Dec	18,000,000	ZARDEF
16	Rice germplasm collection and evaluation	Rice	Deogratias B. Kisandu	M	MSc	2011	Continuous	2,300,000	WOF
17	Development of IPM strategy for the control of parasitic weed (<i>Ranunculus acris</i>) in low land rice in Kyela Tanzania	Rice	Juma Kayeke	M	PhD	2009	11-Dec	30,000,000	ZARDEF
18	Multi-location evaluation and dissemination of improved varieties of wheat with multiple disease resistance and drought tolerance in the Southern Highlands of Tanzania	Wheat	Rose J. Mongi	F	MSc	2009	11-Dec	30,000,000	ZARDEF
19	Improving livelihood through enhanced wheat production in Tanzania, Kenya and Ethiopia	Wheat	Rose Mongi	F	MSc	2011	13-Dec	46,000,000	WOF/EAAP
20	Breeder seed production	Wheat	Rose Mongi	F	MSc	Continuous	continuous	10,000,000	self help
21	Sustainable on- farm production of improved planting materials of avocado fruits in Mbeya region	Horticulture Fruits (Avocado)	Ester Meela	F	BSc	2010	11-Dec	8,000,000	ASDP
22	Improving production of fruits as a contribution to food security, nutrition and income in Sumbawanga Municipal and Rural districts Rukwa region	Horticulture Fruits (Mango)		F	BSc	2009	11-Dec	30,000,000	ZARDEF
23	On- station avocado variety evaluation trial	Horticulture Fruits (Avocado)	Ester Meela	F	BSc	Continuous	Continuous	100,000	self help
24	Maintenance and multiplication of improved apple cultivars	Horticulture Fruits (Apples)	Ester Meela	F	BSc	Continuous	Continuous	150,000	self help
25	Enhancing production of best improved pyrethrum clones in selected districts of Southern Highlands of Tanzania	Pyrethrum	Benjamin Kiwovele	M	MSc	2009	11-Dec	30,000,000	ZARDEF
26	Evaluation and multiplication of improved pyrethrum clones for smallholder farmers in the Southern highlands of Tanzania	Pyrethrum	Benjamin Kiwovele	M	MSc	Continuous	Continuous	300,000	TPB
27	Enhancing rapid increase in pyrethrum production through supply of seeds to farmers in Tanzania	Pyrethrum	Benjamin Kiwovele	M	MSc	2009	11-Dec	32,000,000	PPP/PCT

28	Maize evaluation trials (national variety trials, preliminary evaluation yield trials, observation trials) and some maintenance breeding activities as an initial support before the government funds arrive	Maize	AA Mushongi	M	PhD	Continous	Continous		PPP/SH/MUKPAR
29	Advanced evaluation trial for maize hybrids from South Africa before their release in Tanzania	Maize	AA Mushongi	M	PhD	2010	11-Sep		MUKPAL
30	Maintenance Breeding	Maize	AA Mushongi	M	PhD	Continous	Continous		PPP
31	Evaluation of experimental hybrids from Ph.D. studies	Maize	AA Mushongi	M	PhD	Continous	Continous		Rockefeller/AGRA
32	On-Farm Validation of New Grey Leaf Spot/Maize Streak Virus Resistant Maize Varieties under Rainfed, Irrigated and Residual Moisture Planting in the Southern Highlands of Tanzania	Maize	A E Temu	M	MSc	2009	11-Dec	30,000,000	ZARDEF
33	Determination of maize economic and biological response curves for Nitrogen and Phosphorus in the Southern Highlands of Tanzania	Maize	Michael Mhosole	M	MSc	2009	2011	30,000,000	ZARDEF
34	Improvement of cassava in Southern Highlands	Roots & Tubers	Dora H. Mende	F	MSc	2009	11-Dec	30,000,000	ZARDEF
35	Improvement of irish potato in Southern Highlands	Roots & Tubers	Betty Gondwe	F	PhD	2010	12-Dec	30,000,000	ZARDEF
36	Strengthening local agricultural innovation systems in less and more favoured areas of Tanzania and Malawi to adapt to the challenges and opportunities arising from climate change and variability.	Plant protection	L. Nsemwa	M	MSc	2009	11-Mar	8,137,800	IDRC/CCAA
37	Climbing beans	Beans	M. Kilango	M	MSc	2010	13-Dec	35,000,000	MACKNIGHT
38	Variety evaluation for low N & P, Navy beans, calima.	Beans	M. Kilango	M	MSc	continous	continous	50,000,000	SABRIN
39	Improving livelihoods through promotion of farmer preffered and disease resistant common bean varieties (<i>Phaseolus vulgaris</i> L.) in the SHT.	Beans	Rose Mongi	F	MSc	11-Apr	13-Apr	55,326,000	AGRA
40	Evaluation of international bean angular leaf spot nursery	Beans	F. Mwalyego	F	MSc	continous	continous	3,200,000	SABRIN

41	Evaluation of bean germplasm for multiple constraints resistant	Beans	F. Mwalyego	F	MSc	continous	continous	3,200,000	SABRIN
42	Evaluation trapping nursery for bacterial leaf & rice blast spot resistance	Rice	F. Mwalyego	F	MSc	2010	11-Dec	18,400,000	AFRICARICE
43	Evaluation of low phosphorus bean materials in acidic soils	Beans	M. Mkuchu	F	MSc	2010	12-Dec	640,000	SABRIN
44	Effect of different application of nitrogenous fertilizer sources and rates in released bean varieties.	Beans	M. Mkuchu	F	MSc	2010	12-Dec	320,000	SABRIN
45	Evaluation of bean varieties (new bilfa, farmer nursery low P and Low N, and Calma nursery low N	Beans	M. Mkuchu	F	MSc	2011	13-Dec	160,000	SABRIN
46	Implementation of MOVI program to supporting value chain in sunflower and cassava	Sunflower	M. Mkuchu	F	MSc	2011	13-Dec	22,018,750	PWC
47	Improving soil productivity in smallholders maize based production system through integration of soy bean and ground nut in the SHT.	Soils	Z. Malley	M	PhD	2009/10	2011/12	609,000,000	AGRA
48	Up dating fertilizer recommendations with respect to maize and rice in SHT	Soils	William Mmari	M	MSc	2011	12-Dec	13,966,000	WOF
49	Integrating fertilizer use in ngoro farming system in Mbinga district.	Soils	William Mmari	M	MSc	2010	12-Dec	17,000,000	WOF
50	Promotion of integrated soil, nutrient and water management Technologies	Soil	William Mmari	M	MSc	2010	12-Dec	9,245,000	WOF
51	Training of extension officers and farmers on the appropriate use of fertilizer for sustainable soil management.	Soils	Z. Malley	M	PhD Natural resource	2010	12-Dec	9,320,000	WOF
52	Promotion of consearvation agriculture technologies to small scale farmers of SHT	Mechanisation	N. Mlengera	M	MSc Management of Natural Resources	2010	12-Dec	12,095,000	WOF

53	Development and promotion of mechanization technologies for improving rice productivity.	Mechanisation	N. Mlengera	M	MSc Management of Natural Resources	2011	13-Dec	111,000,000	EAAP
54	Promotion of animal traction ripping and weeding technologies in Chunya	Mechanisation	N. Mlengera	M	Msc soil conservation	2009	11-Dec	30,000,000	ZARDEF
55	The contribution of pyster mushroom cultivation and use of agricultural wastes and household income generation	Food processing	A. Mrema	F	BSc	2011	11-Dec	9,000,000	ASDP
56	Performance testing for soil laboratory as a contribution to soil fertility characterization in SHT	Soils	J. Ngailo	M	MSc	2009	11-Dec	30,000,000	ZARDEF
57	Soil testing services	Soils	J. Ngailo	M	MSc	continous	continous	300,000	SELF HELP
58	Evaluation of integrated plant and pest management of banana in Rungwe and Ileje districts	Plant protection	L. Nsemwa	M	MSc	2009	11-Dec	30,000,000	ZARDEF
59	Promotion of integrated crop and pest management to enhance productivity of organic cocoa in Kyela and Rungwe districts	Plant protection	D. Kabungo	M	BSc	2010	12-Dec	30,000,000	ZARDEF
60	Screening different bean varieties against bean stem maggot on station and on farm.	Plant protection	D. Kabungo	M	BSc	continous	continous	2,000,000	SABRIN
61	Mitigating the impact of climate change on rice diseases in East Africa	Plant protection	F. Mwalyego	F	MSc	2010	12-Dec	42,000,000	AFRCARICE
62	Improvement of high yielding and acceptable bean varieties with high nutrient levels.	Beans	C. Madata	F	PhD	2009	11-Dec	30,000,000	ZARDEF
63	Soy bean genetic improvement for resistance of three diseases	Bean	C. Madata	F	PhD	2009	11-Dec	185,000,000	AGRA
64	On farm variety evaluation, introduction and promotion	Bean	M. Ndimbo	F	MSc	2010	12-Dec	6,000,000	SABRIN
65	Farm budget analysis for priority crops in the SHT	Socio economics	Kissa Mwaisobwa	F	MSc	2010	11-Dec	9,000,000	ASDP
66	Integrated management of major insect pests and diseases of cashew in East and Western Africa.	Cashew IPM	Dr. Zuberi S. Seguni	M	PhD	2009	2012	\$29,000	BMZ/ICIPE

67	Intercropping of Lethal disease (LD) tolerant EAT ex Tanga sub-populations with other tree crops as a stop gap measure to counteract LD in Coast and Tanga regions.	Coconut IPM	Dr. Linus I. Masumbuko	M	PhD	2010	2013	TAS 30,000,000	ZARDEF
68	Introducing IPM strategies for sustainable and environment friendly fruit fly control on smallholder mango orchards in Coast and Dar Es Salaam regions.	Mango IPM	Ntuli N. Swila	F	M.Sc.	2010	2013	TAS 30,000,000	ZARDEF
69	Promotion of orange fleshed sweet potato (OFSP) for increased household incomes and improved nutrition of the rural poor in Muheza and Mkuranga districts of the Eastern Tanzania.	Nutrition and income improvement	Mariam K. Mtunguza	F	M.Sc.	2009	2011	TAS 30,000,000	ZARDEF
70	Multiplication of Tanzanian grape varieties through tissue culture.	Biotechnology –TC innovations	Dr. Linus I Masumbuko	M	PhD.	2010	2012	TAS 30,000,000	ZARDEF
71	Improving Phosphorus supply and availability in organic farming systems.	Soil fertility in organic farming	Dr. Ruth R. Minja	F	PhD	2009	2011	TAS 16,417,170	COSTECH/NFAST
72	Integrated Management of Coconut Lethal Disease in Eastern Zone (Tanga and Coast regions during 2010 -2013).	Coconut IPM	Dr. Anatolia A. Mpunani	F	PhD	2011	2013	TAS 30,000,000	ZARDEF
73	Area-wide and Community based suppression of <i>Bactrocera invadens</i> on small-scale orange orchards to promote orange production in Kwabada, Kilulu and Mlingano villages in Muheza district.	Citrus IPM	Dr. Zuberi S. Seguni	M	PhD	2011	2013	TAS 30,000,000	ZARDEF
74	Morphological and molecular characterization of sorghum hybrids for tolerance to drought and acid soils in Tanzania.	Biotechnology in Sorghum breeding	Dr. Emmanold E. Mneney	M	PhD	2010	2012	TAS 92,039,000	COSTECH/NFAST
75	Processing for commercial exploitation of selected tree-fruits and vegetables.	Processing/value addition	Newton A. Temu (CO-PI)	M	M.Sc.	2009	2011	\$78,000	ASARECA
76	Evaluation and Delivering new sorghum and millet innovations for food security and improvement of livelihoods in Eastern Africa.	Biotechnology in sorghum and finger millet improvement	Dr. Emmanold E. Mneney	M	PhD	2011	2013	\$118,770	BIOINNO-VATE

77	Enhancing Capacity of national Cassava research Programs to diagnose, characterise, monitor and sustainably manage viruses affecting cassava productivity.	Biotechnology in cassava improvement	Dr. Joseph C. Ndunguru	M	PhD	2009	2011	\$1,872,927	BMGF
78	Sweet potato action for security and health in Africa (SASHA)	Biotechnology in sweet potato improvement	Dr. Joseph C. Ndunguru	M	PhD	2010	2012	\$20,800	CIP
79	Developing community based low cost Tissue culture incubators in East and Central Africa.	Biotechnology-Tissue culture	Dr. Emmarold E. Mneney	M	PhD	2011	2011	\$19,450	ASARECA
80	Enhancing food security through improved seed systems and varieties of cassava, potato, and sweet potato resilient to climate change in Eastern Africa.	Improved cassava and potato seed systems	Dr. Alois K. Kullaya	M	PhD	2011	2013	\$109,673	BIOINNO-VATE
81	Rice Germplasm maintenance	Breeding	H. Tusekelege	M	Msc	2000	Continuous		OC-GOT
82	Germplasm maintenance maize	Breeding	GM Iranga	Male	Msc	2000	Continuous		OC-GOT
83	Maintenance of CH1 parents and bred seed production	Breeding	GM Iranga	Male	Msc	2005	Continuous	8,500,000	ASDP-Strategic
84	On farm estimation of DT maize varieties over Non-DT maize	Agronomy	GM Iranga	Male	Msc	2010	2012	US D 5,000	CIMMYT
85	Evaluation of OPVs varieties for 100 days maturity period	Agronomy/Breeding	Late Dr Moshi (GM Iranga)	Male	PhD (Msc)	2010	2013	Tshs 30,000,000	ASDP-ZARDEF
86	Fertilizer(NPK)recommendations for maize and rice	Agronomy	George Ley (Ikerra)	Male	PhD (Msc)	2010	2012	Tshs 30,000,000	ASDP - ZARDEF
87	Climate Change impact assessment in vulnerable agro-landscape in East Africa	Agronomy	T. Ikerra	Male	Msc	2009	2014	Tshs 15,000,000	SUA
88	Participatory variety selection (1,2A,2B) aromatic observation nursery	breeding	H. Tusekelege	Male	Msc.	2009	Continuous		IRRI
89	Sustainable intensification of maize legume cropping systems for food security in Eastern and Southern Africa (SIMLESA)	Objective 2 of project - Agronomy	GM Iranga	Male	Msc.	2010	2014		Government of Australia
90	Development of Crop protection technologies in Africa	Plant protection	T. Kakema	Male	Msc.	2011			EAAPP
91	Integrated Soil Fertility Management Component of Tanzania Accelerated Food Security Project	Integrated Soil Fertility Management	G.J. Ley	PhD	Male	2009/10	2012/13	1,397,000,000	WB

92	Strengthening institutions and capacity for fertilizer quality control in Tanzania	Soil Fertility Management	M.C. Kalumuna	PhD	Female	2010/11	2013/14	386,000*	AGRA
93	Accelerated Uptake and Utilization of Soil Fertility Management Best-Bets Practices in Eastern and Central Africa Sub-Region	Integrated Soil Fertility Management	S.T. Ikerra	PhD	Female	2009/10	2011/12	424,000*	ASARECA
94	Integrated management options for sustainable lowland rice-legumes cropping systems	Integrated Soil Fertility Management	G.J. Ley	PhD	Male	2009/10	2011/12	185,334*	ASARECA
95	Scaling up Minjingu phosphate utilization for balanced fertilization of crops in Tanzania	Integrated Soil Fertility Management	S.T. Ikerra	PhD	Female	2010/11	2011/12	43,753,300	AGRA
96	Scaling out of Rice-legume based cropping systems in some irrigation schemes of Korogwe district	Integrated Soil Fertility Management	S.T. Ikerra	PhD	Female	2009/10	2011/12	30,000,000	ZARDEF
97	Developing a current agro-ecological system to enhance technology targeting for improving crop production in the Eastern zone	Land resources information for improving crop production	J.D.J. Mbogoni	MSc	Male	2009/10	2011/12	30,000,000	ZARDEF
98	Improving crop production in maize - legume cropping system in Handeni and Kilosa districts through integrated soil fertility management	Integrated Soil Fertility Management	M.C. Kalumuna	PhD	Female	2009/10	2011/12	30,000,000	ZARDEF
99	Land suitability assessment for improving maize production in newly established Kilindi District	Land resources information for improving crop production	G.J. Urassa	MSc	Male	2009/10	2011/12	30,000,000	ZARDEF
100	Agronomic evaluation of TWIN –N in improving soil fertility and increase crop yields	Integrated Soil Fertility Management	S.T. Ikerra	PhD	Female	2009/10	2011/12	9,897,000	GOT
101	Improving soil and crop productivity in sisal- maize - legume based cropping system in Korogwe and Muheza distrct.	Sisal Agronomy	Shabani Hamisi	MSc	M	2011/12	2013/14	30,000,000	ZARDEF
102	Multiplication of sisal planting materials by tissue culture	Sisal Biotechnology	Mrs L Swai	BSc	F	2010/11	2014/15	Varies (e.g in 2011/12 =40,000,000/-)	GOT/MAFC
103	Sisal Demionstration of improved management practices	Sisal Agronomy	Shabani Hamisi	MSc	M	2010/11	2014/15	Varies (e.g in 2011/12 =15,000,000/-)	GOT/MAFC
104	Maintenance of Germplasm at SRI	Sugarcane Breeding	Juhudi Chambi	M	MSc.				
105	Smut screening nursery for selected MSIRI and SASRI varities	Sugarcane Breeding	Juhudi Chambi	M	MSc.				
106	Preliminary evaluation of new varieties	Sugarcane Breeding	Juhudi Chambi	M	MSc.				
107	Advanced variety trials	Sugarcane Breeding	Juhudi Chambi	M	MSc.				

108	Disintiveness, Uniformity and Stability test for potential varieties	Sugarcane Breeding	Juhudi Chambi	M	MSc.
109	National Performance Trial for potential varieties	Sugarcane Breeding	Juhudi Chambi	M	MSc.
110	On farm replicated variety trials	Sugarcane Agronomy	Denis William Issa	M	PhD
111	Soil and tissue analysis for the small scale growers	Sugarcane Agronomy	Denis William Issa	M	PhD
112	Research-Extension-Farmer linkage activities	Sugarcane Agronomy	Denis William Issa	M	PhD
113	Promotion of improved husbandry practices	Sugarcane Agronomy	Denis William Issa	M	PhD
114	Promotion of Clean seed cane	Sugarcane Agronomy	Denis William Issa	M	PhD
115	Study of Biology and Ecology of white scale parasitoids	Sugarcane Entomolgy	Juma Kitundu	M	PhD
116	Eldana:Importance of natural enemies and watlend sedges	Sugarcane Entomolgy	Juma Kitundu	M	PhD
117	Monitoring of pests and Diseases	Sugarcane Entomolgy	Juma Kitundu	M	PhD
118	Ratoon Stunting Diseases (RSD) testing in seed cane nursery	Sugarcane Pathology	Nessie Luambano	F	PhD
119	Monitoring of Entomopathogenic Nematodes in Sugarcane fields	Sugarcane Pathology	Nessie Luambano	F	PhD
120	On station and on farm testing of introduced and local Cassava varieties in lowland warm sub humid areas in the Eastern Zone	Roots and Tubers Agronomy	Kiddo Mtunda	F	PhD
121	Identification of Cassava Genotypes Resistant to Cassava mosaic disease and Cassava Brown Streak disease	Roots and Tubers breeding	Kiddo Mtunda	F	PhD
122	Identifying the physiological and genetic traits that make cassava one of the most drought tolerant crops	Roots and Tubers breeding	Kiddo Mtunda	F	PhD
123	Cassava germplasm generation for sustainable food availability and poverty alleviation	Roots and Tubers Agronomy	Kiddo Mtunda	F	PhD
124	Sweet potato Germplasm maintenance and evaluation	Roots and Tubers breeding	Kiddo Mtunda	F	PhD
125	Breeding x cassava for dry matter content, starch, and yield in the humid, and sub humid lowlands of Tanzania	Roots and Tubers breeding	Kiddo Mtunda	F	PhD

126	Breeding Maize Varieties Resistant to Gray Leaf Spot and Northern Leaf Blight in the Low and Intermediate Altitude Areas in Tanzania	Plant pathology	Catherine A. Kuwite	Female	Ph.D.
127	Developing and Disseminating Improved Maize Varieties in Tanzania for Food Security and Improved Household Income	Plant pathology	Catherine A. Kuwite	Female	Ph.D.
128	Improving Soil Fertility, Productivity and Livelihoods of Smallholder Farmers in Tanzania through Intensification and Diversification of Pigeon pea Cropping Systems	Social Economy	Stephen D. Lyimo	Male	M.Sc.
129	Tropical Legumes 11 - Enhancing grain legumes productivity and production, and the incomes of poor farmers in drought-prone areas of sub-Saharan Africa and South Asia	Social Economy	Stephen D. Lyimo	Male	M.Sc.
130	Harnessing Opportunities for Productivity Enhancement (HOPE) of sorghum and millets in Sub-Saharan Africa and South Asia	Plant breeding	Dr. Fridah M. Mgonja	Female	Ph.D.
131	Evaluatin of Beans under drought stress	Plant breeding		Male	M.Sc.
132	Accelerating Uptake and Utilization of Minjingu Rock Phosphate in Tanzania	Soil Science	Ignace Kirango Kullaya	Male	M.Sc.
133	Wheat Germplasm Improvement	Plant breeding	Ibrahim Mamuya	Male	M.Sc.
134	Evaluation of various fruit tree varieties for adaptation in the Northern Highlands of Tanzania	Plant breeding	M.S. Tilya	Male	M.Sc.
135	Screening of fungicides to control sunflower powdery mildew in the northern highlands of Tanzania	Plant pathology	Dr. Mugendi , Lucas	Male	Ph.D.
136	combating Dodder	Plant pathology	Dr. Frida Mgonja	Female	Ph.D.
137	In vitro micro propagation of Banana and Pineapple on station	Biotechnology	G. G.V. Kindimba	Female	M.Sc.
138	Introduction and Evaluation of High value Fruit materials On-station	Horticulture	M.S. Tilya	Male	M.Sc.
139	Community Based Wheat Seed Production to Enhance Yields in Hanang District, Northern Tanzania	Wheat Breeding	Ibrahim N. Mamuya	Male	M.Sc.

140	Enhancing capacity of Farmer Groups to produce quality bean seed in Lolkisale Ward – Monduli District	Bean Breeding	S.O. Kweka	Male	M.Sc.
141	Demonstration and dissemination of integrated pests management strategies for the control of Bean Stem Maggot (BSM) on snap bean in northern Tanzania	Entomology	Simon Slumpa	Male	M.Sc.
142	Promotion of mushroom production by using hydrogen peroxide as a substrate sterilizer to save time, production cost and the environment in the Northern zone.	Horticulture	Ndeshi/Agatha Aloyce	Female	M.Sc.
143	Assessment of pastoral communities' vulnerability to conflicts due to effect of climate change: Case study of Mwanga and Simanjiro Districts in Northern Tanzania	Social Economy	Frank Mmbado	Male	M.Sc.
144	Promotion of integrated pest management (IPM) Technology in Vegetable production through demonstration and farmers training in northern Tanzania	Weed Science	Mr. Bashir R. Makoko	Male	M.Sc.
145	On-farm Demonstration and Quality Declared seed production of Drought Tolerant Maize Varieties in Northern zone	maize Breeding	Kheri Kitenge	Male	M.Sc.
146	Strategies to enhance adoption of improved selected fruits production to stimulate Local and Export markets in northern Tanzania	Horticulture	Ndeshi S. Munisi	Female	M.Sc.
147	Conduct Economic analysis of Partial budget in farm management for maize productivity in the Northern Zone Tanzania	Social Economy	Upendo Titi	Female	M.Sc.
148	Improvement of Apple production in Lushoto district	Horticulture	Mr. Hassan Shelukindo	Male	M.Sc.
149	Promoting production and competitiveness of small holder peach & apple fruits producers in Arumeru district for poverty alleviation	Horticulture	Nancy Kaaya	Female	M.Sc.

150	Upgrading of local goats with the Tanzania Blended bucks; and development of disease treatment and preventive measures for meat production and income generation in agro pastoral systems of Sale – Ngorongoro district	Animal Husbandry	Dr. R.N. Mero	Male	Ph.D.
151	Promotion of nutritious fodder materials to improve productivity of dairy animals in Hai and Moshi Rural districts.	Animal Husbandry	Charles Lyamchai	Male	M.Sc.
152	Promotion and dissemination of watermelons (<i>Citrullus vulgaris</i>) as an alternative source of water and protein supplements in agro-pastoral villages in Same District	Animal Husbandry	Mrs M.G. Minja	Female	M.Sc.
153	Epidemiology of Fowl Typhoid and its Control/Eradication in northern Tanzania	Animal Husbandry	Dr. E.S. Swai	Male	Ph.D.
154	Deployment of Insecticide Impregnated Targets (IIT) for the control of tsetse flies in Simanjiro District, Northern Tanzania	Animal Husbandry	Epiphania E. Kimaro	Female	M,Sc.
155	Dissemination of Livestock Crisis Mitigation technologies to Pastoral communities of Northern zone	Animal Husbandry	Abel Mtambuk	Male	Msc
156	Development and Promotion of Higher Yielding, Drought Tolerant and Disease Resistant Maize Varieties for Farmers in Northern Zone, Tanzania.-(Funded by AGRA)	Pathology	Dr. Catherine Kuwite	Female	PhD
157	Promoting use of balanced fertilizer with special focus on Minjingu phosphate rock based products in crop production.	Soil fertility	Ignass kulaya	Male	MSc
158	An in-depth study of PES and PES-like initiatives and Review of their institutional contexts in West Usambara Mountains, Lushoto District, Tanzania	NRM	Charles Lyamchai	Male	MSc
159	Enhancing production of quality organic ginger by small scale farming communities in Tanzania	NRM	Charles Lyamchai	Male	MSc

160	Shifts in natural resource management and livelihood strategies: Adaptation and coping mechanisms to climate variability and food security in East Africa	NRM	Charles Lyamchai	Male	MSc
161	Climate Change, Agriculture and Food Security (CCAFS) in Lushoto district	NRM	Charles Lyamchai	Male	MSc
162	Eastern Africa Agricultural Productivity Programme (EAAPP)	Crops	Ibrahim Mamuya	Male	MSc
163	Maize Breeder Seed Production	Maize breeding	A.B.C. Mbiza.	M	MSc
164	Multiplication of newly released maize variety Bora	Maize breeding	ABC Mbiza	M	MSc
165	Development of pigeon pea ratooning regime for the Maize-Pigeonpea	Maize breeding	ABC Mbiza	M	MSc
166	Evaluation of Maize hybrid Varieties from Thailand for adaptability and yield	Maize breeding	ABC Mbiza	M	MSc
167	Screening of maize germplasm from various sources for yield.	Maize breeding	Christine Kaswahili	F	BSc
168	Breeding for a 100 day maturity maize variety for the lowland zone.	Maize breeding	Christine Kaswahili	F	BSc
169	Promotion of newly released medium maturity maize Varieties in the drought prone areas of Eastern Tanzania.	Maize breeding	Christine Kaswahili	F	BSc
170	Evaluation of WEMA (CIMMYT and Monsanto) advanced drought tolerant hybrids for yield and adaptation in the mid altitude of Tanzania.	Maize breeding	Christine Kaswahili	F	BSc
171	Evaluation of open pollinated maize varieties to be released in Western Zone	Maize breeding	Christine Kaswahili	F	BSc
172	Evaluation of early to intermediate maize hybrid varieties to be released in Western Zone	Maize breeding	Christine Kaswahili	F	BSc
173	Maize germplasm maintenance, using bulk pollination.	Grain legume breeding	Christine Kaswahili	F	BSc
174	Medium Duration Pigeonpea advanced Varietals trial.	Grain legume breeding	Joseph Mligo	M	PhD
175	Medium Duration Pigeonpea Wilt trial.	Grain legume breeding	Joseph Mligo	M	PhD

176	Long Duration Pigeon pea wilt trial.	Grain legume breeding	Joseph Mligo	M	PhD
177	Production of grain legumes breeder seed for enhanced seed availability and food security to small scale farmers in eastern zone	Grain legume breeding	Joseph Mligo	M	PhD
178	Pigeonpea, cowpea and soybean seed multiplications	Grain legume breeding	Joseph Mligo	M	PhD
179	On farm Verification of outstanding short duration pigeonpea genotypes in eastern zone	Grain legume breeding	Meshack Makenge	M	BSc
180	Introduce and promote Improved Best-bet Cowpea and Pigeon pea Varieties, Management practices, Utilization and marketing for increased crop Productivity and production in Eastern Zone	Grain legume breeding	Joseph Mligo	M	PhD
181	Promotion of Sorghum Production and Utilization in the Eastern Zone	Sorghum and millet processing and utilization	Salvatory Kundi	M	MSc
182	Increasing Sorghum Utilization and Marketing through Food Product Diversification in the ECA Sub-Region	Sorghum and millet processing and utilization	Salvatory Kundi	M	MSc
183	Sunflower Breeder Seed Production	Oil seeds breeding	Clesencia Rutaihwa	F	MSc
184	Sesame Variety Evaluation Trial	Oil seeds breeding	Clesencia Rutaihwa	F	MSc
185	Evaluation of Sunflower Germplasm for disease resistance, adaptability and Yield in the Eastern zone	Oil seeds breeding	Clesencia Rutaihwa	F	MSc
186	Evaluation of Sunflower Varieties in the Northern Highlands of Tanzania	Oil seeds breeding	Clesencia Rutaihwa	F	MSc
187	Investigation of changes of soil fertility status with time under continuously cotton production at ARI Ilonga	Cotton agronomy	Suvi Titus William	M	BSc
188	The potential of predatory coccinellid species in relation to the Management of Cotton Aphids, in Morogoro region, Tanzania	Cotton plant protection	Furaha Mrosso	M	MSc
189	Effect of rotating cotton with sorghum Pigeon pea and Cowpea on soil fertility	Cotton agronomy	Suvi Titus William	M	BSc

190	To compare the performance of two released commercial cotton varieties from ARI Ukiriguru with the promising two lines from ARI Ilonga	Cotton breeding	Sebastian Missanga	M	MSc
191	Demonstration on ten recommendations for Cotton production to Farmers and Extension field officers	Cotton agronomy	Yassin Mashuhubu	M	BSc
192	Multiplication of the cotton varieties	Cotton breeding	Sebastian Missanga	M	MSc
193	Enhancing farmers' household food security and income through development of high yielding drought tolerant rice and value addition	Rice breeding	Nkori John Kibanda	M	MSc
194	Genetic enhancement to increase productivity in rice through breeding for resistance to Rice Yellow Mottle Virus (RYMV) disease in Tanzania	Rice breeding	Nkori John Kibanda	M	MSc
195	Enhancing adoption of a newly released high yielding aromatic TXD 306 rice variety through post-harvest head rice milling recovery improvement	Rice agronomy	Nkori John Kibanda	M	MSc
196	Baby and Mother trials of Rice Varieties	Rice breeding	Nkori John Kibanda	M	MSc
197	Evaluation of Upland and Lowland NERICA genotypes	Rice breeding/agronomy	Nkori John Kibanda	M	MSc
198	Rainfed lowland inbred rice observational nursery	Rice breeding/agronomy	Nkori John Kibanda	M	MSc
199	Lowland hybrid rice evaluation trial	Rice breeding/agronomy	Nkori John Kibanda	M	MSc
200	Production of pre-basic, basic and certified seeds	Rice breeding	Nkori John Kibanda	M	MSc
201	Germplasm maintenance & conservation	Rice breeding	Nkori John Kibanda	M	MSc
202	Sesame variety evaluations	Sesame breeding	Omari Kalanje Mponda	M	PhD
203	Groundnut variety evaluations	Groundnut Breeding	Omari Kalanje Mponda		PhD
204	Bambara groundnut variety evaluations	Bambaranut Breeding	Omari Kalanje Mponda	M	PhD
205	Seed Production	Sesame and Groundnut Breeding	Omari Kalanje Mponda	M	PhD

206	IPM strategies to control sesame flea beetle	Sesame crop protection	Omari Kalanje Mponda	M	PhD
207	Mitigation of aflatoxin in groundnut	Groundnut Crop protection	Omari Kalanje Mponda	M	PhD
208	Evaluation of herbicides for weed control in sesame	Agronomy	Elly Kafiriti	M	PhD
209	Validation of plant spacing in sesame	Agronomy	Elly Kafiriti	M	PhD
210	Cassava variety evaluations	Cassava Breeding	Geofrey Mkamilo	M	PhD
211	Primary Multiplication of improved Cassava Varieties	Cassava Breeding	Geofrey Mkamilo	M	PhD
212	Variety evaluation for resistance to CBSD and CMDV	Cassava Breeding & Pathology	Geofrey Mkamilo	M	PhD
213	Evaluation of cashew clones	Cashewnut Breeding	Peter Massawe	M	PhD
214	Screening various fungicides for the control of PMD in cashew	Crop protection	Mark Sijaona	M	PhD
215	Screening various insecticides against sucking pests in cashew	Crop protection	Mark Sijaona	M	PhD
216	Evaluation of insecticides in the control of Mealybug	Crop protection	Mark Sijaona	M	PhD
217	Establishment of potential botanical garden	Crop protection	Mark Sijaona	M	PhD
218	Screening different types of herbicides against weeds in cashew	Agronomy	Louis Kasuga	M	PhD
219	Investigating different measures for the control of parasitic weed (cassitha spp) on cashew	Agronomy	Louis Kasuga	M	PhD
220	Enhancement of survival of stool shoot transplants by compounds stimulating plant physiological processes	Vegetative propagation	R A Bashiru	M	MSc
221	Effect of Plastic Plant Bag (PBB) and Seedling Holding Time on the growth of cashew seedlings in the nursery	Vegetative propagation	R A Bashiru	M	MSc
222	Comparison of different canopy management practices on productivity of grafted cashew trees	Vegetative propagation	R A Bashiru	M	MSc
223	Development of macro propagation and tissue culture techniques for mass propagation of cashew	Biotechnology	Emarold Mneney	M	PhD
224	Characterisation and diversity studies of cashew germplasm	Biotechnology	Emarold Mneney	M	PhD

225	Quantitative trait loci (QTL) and genome map	Biotechnology	Emarold Mneney	M	PhD
226	Integrated soil management practices for improving soil fertility in cashew growing areas of the southern zone	Soil Science	John Tenga	M	MSc
227	Soil Fertility Management for Increased Rice Productivity in Shinyanga Rural and Bukombe Districts, Lake Zone	Soil fertility management	Kajiru, G.J.	M	PhD
228	Review rice fertilizer recommendation in Shinyanga Rural and Bukombe Districts, Lake Zone	Soil fertility management	Kajiru, G.J.	M	PhD
229	Improving rice productivity through enhanced agricultural water management	Soil-water management	Kajiru, G.J.	M	PhD
230	Improvement of soil fertility management practices in rainfed lowland rice system	Soil fertility management	Kajiru, G.J.	M	PhD
231	Soil fertility improvement for cassava and maize production on dominant agricultural soils in Ukerewe district	Soil fertility management	Kaihura, F.B.	M	MSc
232	Soil fertility improvement for cassava and maize production on dominant agricultural soils in Ukerewe district	Soil fertility management	Kaihura, F.B.	M	MSc
233	Verification of Integrated Soil Fertility Management technologies for maize production on sandy and volcanic soils in Tarime and Serengeti districts lake zone	Soil fertility management	Kaihura, F.B.	M	MSc
234	Review of fertilizer recommendations for maize production in Tarime and Serengeti districts Lake zone	Soil fertility management	Kaihura, F.B.	M	MSc
235	Review and improvement of Misungwi district soil and crop suitability maps	Land evaluation	Kaihura, F.B.	M	MSc
236	Crop genetic varieties improvement	Cotton breeding	Ottavina Ramadhan	F	MSc.
237	Crop genetic varieties improvement	Cotton breeding	Everine Lukonge	F	PhD
238	Crop husbandry management	Cotton agronomy	Robert Kileo	M	MSc.
239	Crop Pest management (Pathology)	Cotton pathology	Tryphon Kibani	M	PhD
240	Crop Pest management (Insect pests)	Cotton pathology	Epifania Temu	M	MSc

241	Crop genetic varieties improvement	Sorghum breeding	Seperatus Kamuntu	M	MSc.
242	Cassava germplasm development	cassava breeding	H.Kulembeka	M	PhD
243	Cassava multiplication	cassava breeding	H.Kulembeka	M	PhD
244	Sweet potato germplasm development	Sweet potato breeding	H.Kulembeka	M	PhD
245	Cassava Fertilizer Trial	Cassava agronomy	M.H.Massawe	F	Msc.
246	Cassava processing and marketing	Cassava post harvest	T. Ngendello	F	Msc.
247	Great Lakes Cassava Initiative (GLCI)	Cassava post harvest	T. Ngendello	F	Msc.
248	Dissemination of push-pull technology for control of Striga weeds and stem borers in maize and sorghum based Farming Systems in Mara region	Maize, Sorghum, Livestock, Socio-economics	Dr. January Mafuru	M	PhD
249	Rice value chain development in Bunda district, Mara region.	Rice and Socio-economics	Dr. January Mafuru	M	PhD
250	Development of Milk Value Chain in Misungwi District	Dairy Cattle and Socio-economica	Adventina Babu	F	MSc
251	Rosella Value Chain Analysis in Misungwi district	Rosella and Socio-economics	George Sonda	M	MSc
252	Cotton sub sector value chain Analysis	Cotton and Socio-economics	George Sonda	M	MSc
253	Analysis of Farm Budgets for selected crops in the Lake Zone	Maize, Sorghum, Cotton, Rice and Socio-economics	Adventina Babu	F	MSc

Table F.3. DRD Publications, 2000 to Date

S/No	Title	Authors	Where Published	Year published
10	Assessment of rice production constraints and farmers preferences in Nzega and Igunga districts	Bucheyeki, T.L., E. Shennkalwa, D. Kadadi, and J. Lobulu	Journal of Advances in Developmental Research	2011
37	Cassava: constraints to production and the transfer of biotechnology to African laboratories.	Simon E. Bull • Joseph Ndunguru , Wilhelm Gruissem, John R. Beeching, HerveVanderschuren	Plant Cell Report, DOI 10.1007/s00299-010-0986-6.	2011
22	Cogon grass(Imperata cylindrica) Land Use Changes,Agrodiversity and Food Security in Kasulu District,Tanzania	F.M. Bagarama&P.K. Sibuga	Proceedings of the 25th Soil Science Society of East Africa	2011
135	ConsevationAgriculture(CA) in tanzania"the caseof Mwangaza B CA farmer field school(FFS),Rhotia village,Karatu district,Arusha.	Marietha Owenya and Wilfred Mariki, Joseph Kienzie, TheodorFriedrich andAmir Kassam	Published in the International Journal Of Agric Science	2011
25	Cropping Systems,Termite Activity and Crop Residues Decomposition at Tumbi in the Miombo Forestered Zone, in Western Tanzania	F.M.Bagarama	Proceedings of the 25th Soil Science Society of East Africa	2011
36	Impact of interspecific competition by compatriot aquatic weeds on water hyacinth <i>Eichhornia crassipes</i> (Martius) Solms growth and development in the Kagera River	Katagira, F, Kyamanywa, S, Tenywa, J. S, Rajabu, C. A, Sombe, D, and Ndunguru, J.	International Journal of Biodiversity and Conservation Vol. 3(8), pp. 345-357	2011
2	Nutrient deficiencies and their symptoms in upland rice	J. J. Mghase, H. Shiwachi, H. Takahashi and K. Irie	J. International Society for Southern Asian Agricultural Sciences Vol. 17 No. 1: 59-67	2011
77	Soils and management requirements for development of sustainable agriculture of Moshi Rural district, Kilimanjaro region.	Mbogoni, J.D.J., S.B. Mwango.	Mlingano, Tanga.	2011

78	Suitability assessment of soils and climate for agriculture development of Mwavi Farm, Bagamoyo District, Coast region.	Mbogoni, J.D.J., S.B. Mwango.	Mlingano, Tanga.	2011
105	Sustainable Development/Participatory Rural appraisal for the marginal areas of Pangani Basin (Kiverenge village, Mwanga District).	Lyamchai, C. J. , B Kiteme, S.D.Lymo, J. Mathuva, F. Ngulu, M. Kingamkono, T. E. Mmbaga, A.F. Makauki, H. Mansoor, S. Kweka, N. Munisi, M. Owenya, G. Sayula, E. Kweka and H. Mrutu.	In CIMMYT 2000. The Eleventh Regional Wheat Workshop for Eastern Central and Southern Africa . Addis Ababa Ethiopia	2011
27	Terminalia sericea(Burch ex Dc) as a Dynamic Factor for Changing Agriculture and Ecosystem Service Functions in the Western Zone	F.M Bagarama	Proceedings of 50 years of IRA,UDSM,Climate Change and Natural Resource Management	2011
24	Termite Mounds and Crop Production in the Tobacco-Cereal Farming System in Miombo Woodlands in Western Tanzania	F.M. Bagarama	Proceedings of the 25th Soil Science Society of East Africa	2011
32	The effect of ground vegetation management on competition between the ants <i>Oecophylla longinoda</i> and <i>Pheidole megacephala</i> and implications for conservation biological control	Z. S. K. Seguni , M. J. Way, P. Van Mele	J. Crop Protection 30 (2011) 713-717	2011
1	Agronomic and socio-economic constraints to high yield of upland rice in Tanzania	J. J. Mghase, H. Shiwachi, K. Nakasone and H. Takahashi	African Journal of Agricultural Research Vol. 5 (2), pp. 150-158	2010
144	Amistar Xtra 280SC for the Control of Foliar Diseases of Barley in Northern Tanzania	C.A. Kuwite, L.J. Mlay and C.E. Msuya	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2010
26	Bracken fern(<i>Pteridium aquilinum</i> (L.) Kuhn) Invasion of Agricultural Fields and its Implication to Germination of Certified Seeds of Some field Crops in Tanzania	F.M. Bagarama	Proceedings of the 6th Moi University International Conference,Nairobi,2010	2010

30	Constraints to dry season vegetable growing and pathways of ground water contamination in Western Tanzania	F.M. Bagarama	Biennial Scientific Conference National University of Rwanda,Buye,Rwanda	2010
145	Control of foliar Diseases of Wheat by Amistar Xtra 280SC in Northern Tanzania	C.A. Kuwite, L.J. Mlay and C.E. Msuya 2010	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2010
29	Crop systems and Soil types influence rat burrowing in crop fields:case study of the multimmmate rat Mastomys natalensis Smith 1934 in Western Tanzania	F.M Bagarama	Biennial Scientific Conference National University of Rwanda,Buye,Rwanda	2010
23	From a class to the farmers' association supporting technology adoption with financial credits: A case from Tabora,Tanzania	F.M. Bagarama& B.Kayila	JCEE SUA	2010
83	Genetic Diversityof Cowpea (Vigna unguilata) in East Africa	John E.Sariah,Jihad and Gunter Backes	Department of Agriculture and Ecology, University of Copenhagen	2010
31	Mulching and Weed Diversity in the Banana-Coffee Field in Western Tanzania	F.M. Bagarama	Moi University 6th Biennial Scientific Conference, Nairobi,Kenya	2010
162	Participatory Soil Fertility Appraisal of Ngarenanyuki And Oldonyosambu Wards For Sustainable Agriculture. 51pp.	Kullaya I.K; P.Massawe na W.Msaky. (2010)	Selian ARI Publication series	2010
163	Participatory Soil Fertility Appraisal of selected vilages of Loliondo ward in Ngorongoro district for Sustainable Agriculture. 40pp.	Kullaya I.K; P.Massawe na W.Msaky. (July 2010)	Selian ARI Publication series	2010
3	Production of tuber crops in Tanzania	E. M. Mgonja	J. Japan Root and Tuber Crops Dev. Asso. (JRTA) Vol. 104 24-28	2010
19	Socio-economic factors influencing adoption of improved fallow practices among smallholder farmers in western Tanzania	Matata, P.Z, Ajayi, O.L,Oduol,P and Agyuma, A	Africa Journal of Agricultural Research	2010

172	Soil Fertility Evaluation of Terrat and Sokon Wards of Arusha Municipality for sustainable agriculture. 39 pp.	Kullaya I.K.; H.A. Mansoor, G Mkindi (2010)	Selian ARI Publication series	2010
168	Soil fertility appraisal of Mlola division of Lushoto district for sustainable agriculture 39pp.	Mansoor H.A; I.K.Kullaya (2010)	Selian ARI Publication series	2010
38	The complete genome sequence of the Tanzanian strain of <i>Cassava brown streak virus</i> and comparison with the Ugandan strain sequence.	Wendy A. Monger, T. Alicai, J. Ndunguru , Z. M. Kinyua, M. Potts, R. H. Reeder, D. W. Miano, I. P. Adams, N. Boonham, R. H. Glover and J. Smith	Archieves of Virology, 155:429-433	2010
12	The groundnut client oriented research in Tabora,Tanzania	Bucheyeki, T.L., E.M. Shenkalwa, T.X. Mapunda, and L.W. Matata.	African Journal of Agricultural Research	2010
11	Yield performance and adaptation of four sorghum cultivars in Igunga and Nzega districts of Tanzania	Bucheyeki, T.L., E.M. Shenkalwa, T.X. Mapunda, and L.W. Matata.	Communications in Biometry and Crop Science	2010
134	Conservation Agriculture for Sustainable Agriculture and Rural Development	Wilfred Mariki and Marietha Owenya.	Paper, presented to the CARE International Tanzania CA project Inception workshop; held in Oasis Hotel Morogoro, April 2009	2009
164	Evaluation and solution of the identified soil fertility problems of Mtowa Mbu rice basin in Monduli district. 27 pp..	Mansoor H.A and I.K.Kullaya (2009).	Selian ARI Publication series	2009
133	Farm Labor, Gender Equity & the design for enabling policies for Conservation.	Marietha Owenya and Wilfred Mariki :	Presented to the 4 th World Congress on Conservation Agriculture in India 3 rd to 7 th February 2009.	2009
13	Genetic variability characterisation of Tanzania sorghum landraces based on simple sequence repeats (SSRs) molecular and morphological markers	Bucheyeki, T.L., C. Gwanama, M. Mgonja, M. Chisi, R. Folkertsma, and R. Mutegi	African Crop Science Journal	2009
147	High Yielding Disease Resistant Maize Varieties H208 and H308 Released for the Medium Altitude Areas of Tanzania.	C.A. Kuwite, K.Kitenge, F.S.Ngulu, P. Matowo, G. Kazimoto, D. Mugunda and L.J. Mlay. 2009	Proceedings, African Seed Systems Meeting, Bamako, Mali 5th-8th October 2009.	2009

39	Impact of common sweetpotato viruses on total carotenoids and root yields of an orange-fleshed sweet	R. Kapinga, J. Ndunguru , G. Mulokozi, S. Tumwegamire	Scientia Horticulturae.122: 1-5	2009
109	LandCare-Tanzania brief.	Lyamchai, C. J., T. E. Mmbaga and H. Bradburn.	LandCare publication SARI. No. 2	2009
33	Multiple sources of local knowledge: a global review of ways to reduce nuisance from the beneficial weaver ant <i>Oecophylla</i>	Paul Van Mele, Nguyen Thi Thu Cuc, Zuberi Seguni , Koumandian Camara, Joachim Offenber	International Journal of Agricultural Resources, Governance and Ecology (IJARGE) Volume 8 - Issue 5/6 - 2009	2009
169	Soil fertility appraisal for Kifaru farm irrigated sugarcane production.	Mansoor H.A; I.K.Kullaya	Selian ARI Publication series	2009
167	Soil fertility appraisal of Mlola division of Lushoto district for sustainable agriculture 39pp.	Mansoor H.A; I.K.Kullaya (2009)	Selian ARI Publication series	2009
166	Soil fertility appraisal of selected villages of Babati district for sustainable agriculture 39pp.	Mansoor H.A; I.K.Kullaya, E. Njau (2009).	Selian ARI Publication series	2009
170	Soil fertility appraisal of selected villages of Hanang district for sustainable agriculture 39pp.	Kullaya I.K.; H.A. Mansoor (2009)	Selian ARI Publication series	2009
165	Soil fertility evaluation of selected villages of Simanjiro district for sustainable agriculture 40pp.	Mansoor H.A; I.K.Kullaya, D.Shirima and W. Msaky	Selian ARI Publication series	2009
171	Soil Fertility of Selected villages of Singida district and for sustainable agricultura. 47 pp. Selian ARI Publication series	Mansoor H.A; I.K.Kullaya, L.J. Sakwera (2009).	Selian ARI Publication series	2009
28	Cogon grass(<i>Imperata cylindrica</i> var African)(Anderss.) a Threat to Biodiversity and Food Security in Kigoma Region, Western Tanzania	F.M. Bagarama&J.L.Loatha	Proceedings of the Third National Science, Technology and Innovation Conference and Exhibitions	2008
6	Development and Promotion of wild rice management strategies for the lowlands of Southern Tanzania.	Mbapila, J.C. and Kibanda, N.J.M.	DFID Crop Protection Program, Final Report	2008

173	Evaluation and solution of the identified problems of salt affected soils in the Mangola Onion production basin of Karatu district. 27 pp.	Mansoor H.A; I.K.Kullaya; P.Sule and W. Msaky (2008)	Selian ARI Publication series	2008
14	Morphological characterization of Tanzanian sorghum [<i>Sorghum bicolor</i> (L) Moench] landraces	Bucheyeki, T.L., C. Gwanama, M. Mgonja, M. Chisi, and R. Folkertsma	Kasetsart Journal of Natural Science	2008
15	On-farm evaluation of promising groundnut varieties for adaptation and adoption in Tanzania	Bucheyeki, T.L., E.M. Shenkalwa, T.X. Mapunda, and L.W. Matata.	African Journal of Agricultural Research	2008
76	Participatory technology development for improving soil productivity in Cassava-based farming systems in Tanzania and Malawi.	Kiwambo, B. J., Senkoro, C. J. and Tenge, A. J.	FIRCOP - SADC Project 07 Annual Report. ARI - Mlingano, Tanga, Tanzania. 67 pp.	2008
132	Tanzania and Kenya CA SARD project Paper.	Barak Okoba Wilfred Mariki and Marietha Owenya,	Presented to the Soil Health FAO workshop conducted in Rome Italy	2008
87	Building the Financial Capital of Mountain communities for Enhanced Integrated NRM: The case of Lushoto District.	Mowo, J., Opondo C., Girma H., Lyamchai, C. J. , Wickama J., Mmbaga T. and Rao S.	Johannesburg, South Africa	2007
130	Conservation Agriculture as practiced in Tanzania	Dominic Ringo, Catherine Maguzu, Wilfred Mariki , Marietha Owenya Ermason Njumbo, and Frank Swai	Karatu district case study	2007
129	Conservation Agriculture as practiced in Tanzania,	Catherine.W. Maguzu, Dominic Ringo, Wilfred Mariki , Marietha Owenya Flora Cola and Charles Leseyo	Arumeru district case Study	2007
82	Effect of sowing time on infestation of Bean Maggot (<i>Phaseolus vulgaris</i> L.) by two spp.of the Bean stem Maggot, <i>Ophiomyia spencerella</i> and <i>O. phaseoli</i> (Diptera: Agromyzidae)	John E.Sariah and R.H.Makundi	Archives of Phytopathology and Plant Protection	2007
150	Evaluation of Artea for the Control of Foliar Diseases of Wheat in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2007	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2007

148	Evaluation of Subatil for the Control of Foliar Diseases of Wheat in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya: 2007.	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2007
88	Facilitators' Guide on District Institutional Collaboration for Integrated Livelihoods and Conservation. <i>AHI Methods Guide</i> .	Tanui, J., R. Lutalo, C. J. Lyamchai and M. Hewison.		2007
4	Influence of Genetic and Genotype x Environment Interaction on Quality of Rice Grain	Kibanda, N.J.M. and Luzi-Kihupi, A.	African Crop Science Journal. 1(4), 173-182 pp	2007
80	Land resources mapping for land capability assessment for development of land use framework plan for Mbarali district, Mbeya region.	Mbogoni, J.D.J., B.J. Kiwambo, S.J. Hiza, R.K. Kimaro.	The National Land Use Planning Commission (NLUPC), Dar es Salaam.	2007
86	Policy and Institutional Context for Natural Resource Management in Tanzania: A Basis for Developing a Landcare Program.	Lyamchai C. J. , Ngatoluwa R., Mmbaga T., Massawe N., Lema N., Catacutan D. and Tanui J.	ICRAF,NAIROBI.	2007
110	Practical Approaches for Effective by-laws in Lushoto District.	Mmbaga, T. E., C. J. Lyamchai , H.Mansoor, J.Wickama	AHI Reports, Lushoto Benchmark.	2007
79	Soil and land suitability mapping of Razaba farm for commercial production of sugarcane, Bagamoyo district. SEKAB BioEnergy Tanzania.	Mbogoni, J.D.J., G.J. Urassa, S.J. Hiza, R.K. Kimaro.	Mlingano, Tanga.	2007
146	Subatil for the Control of Foliar Diseases of Barley in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2007
9	The assesment of gender relations among small scale tobacco producers in Urambo district Tabora region, Tanzania	Mbwambo,J.S., Matata-Masolwa,	Journal of the Korean Association of African studies	2007

52	The capacity of On farm Research in Reducing Poverty; Experience from twenty seven projects in Tanzania	Tarimo, A.J.P; H. Johnsen,S.Mbaga,FTM Kilima,J.Sesabo,JM Abdallah,GM Iranga	Tanzania Journal of Agriculture science; 8(2):103-114	2007
131	Weed control in Conservation Agriculture.	Wilfred Mariki and Marietha Owenya.	A paper presented to the ACSAD workshop in Syria 2007	2007
18	Analysis of the effects of rotational woodlots on the nutrition and yield of maize following trees in western Tanzania	Nyadzi, G.I., B.H. Janssen, and O. Oenema.	Agriculture, Ecosystems & Environment	2006
153	Anchor 200FS as a Seed Treatment Fungicide for Wheat in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2006	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2006
152	Control of Foliar Diseases of Wheat Using Soprano C in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2006.	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2006
114	Effect of planting densities on productivity of drought tolerant maize in semi-arid ecologies,	Mesfin T., H. Harrun, T.E. Mmbaga , P.R. Matowo and D.K. Friesen.	Presented at the GTZ/BMZ-Africa Maize Stress (AMS) project review, Nairobi, Kenya,	2006
154	Effectiveness of Anchor 200FS in Controlling Diseases in Barley in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2006	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2006
113	Effectiveness of Tied ridges for soil moisture conservation and improved productivity of drought tolerant maize in semi-arid ecologies	T.E. Mmbaga , P.R. Matowo, T. Mesfin, H. Harrun,and, D.K. Friesen.	Presented at the GTZ/BMZ-Africa Maize Stress (AMS) project review, Nairobi, Kenya,	2006
151	Efficacy of Soprano C In Controlling Foliar Diseases Of Barley In Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2006.	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	2006

89	Farmers Innovations in Natural resource Management: Lessons and Challenges from Lushoto, Tanzania.	Lyamchai, C. J. , M.N. Kingamkono, J. G. Mowo and L. German.	Amede T., L. German, S. Rao, C. Opondo and A. Stroud (eds). Integrated Natural Resource Management in Practice: Enabling communities to improve mountain livelihoods and landscapes. Proceeding of the African Highland Initiative.	2006
111	Increasing the tolerance of drought and low-N stresses in Southern Africa.	Matowo P. R., T.E.Mmbaga , K. Kitenge, J. Assenga and S.D. Lyimo.	In Annual Report 2006. New Seed Initiative for Maize in Southern Africa (NSIMA).	2006
112	Maize Varieties Evaluation and Community Based seed production in Kiteto District (2002.3, 2003/4 and 2005/6 seasons).	Matowo P.R., Z.O. Mduruma, T.E. Mmbaga , L.C. Mushi, N. Mollel and T. Semuguruka	SARI PUBLICATION SERIES NO. 9.	2006
85	Simultaneous detection of viruses in planting materials by Enzyme Linked Immunosorbent Assay (ELISA) technique. Forst COSTECH Scientific and Technological Conference.	J.E. Sariah and Lyimo H.F.	Dar es salaam ,Tanzania	2006
91	The Challenges and Opportunities in Leading a Multi-disciplinary Team of Professionals from Multiple Institutions: Lessons from AHI Lushoto.	Mowo, J.G., Lyamchai, C.J. , Stroud, A. and Opondo, C.	<i>In: Integrated Natural Resources Management in Practice: Enabling communities to improve mountain livelihoods and landscapes. Amede, T., German, L., Opondo, C., Rao, S. and Stroud, A. (eds.),</i>	2006
21	The effect of Sesbania sesban fallows on striga incidences and maize yield in Tabora region. Proceeding of second National Agroforestry and Environment workshop:	Matata, P.Z, Ajayi, O.L, Oduol, P and Agyuma, A	Agroforestry Proceedings, Mkapa Hall, Mbeya Tanzania	2006
125	The effect of stem borers on maize production in Tanzania.	Kitenge ,K.M.	Proceeding of Insect Resistant maize for Africa. Workshop held at Nairobi Safari club Hotel, Nairobi, Kenya	2006

90	The potential of <i>Calliandra calothyrsus</i> in poverty alleviation in the slopes of mount Kilimanjaro and mount Meru, Tanzania .	Lyamchai, C. J. , M. Kingamkono, C. Wambugu, J. Stewart, S. Franzel and H. Mansoor	Paper presented to the First COSTECH Scientific and Technical Conference. Held in Dar es Salaam	2006
84	A functional response of Braconid parasitoids of the bean stem maggot, (<i>Ophiomyia spencerella</i> (Diptera, Agromyzidae) in beans(<i>Phaseolus vulgaris</i> L.) in Tanzania	R.H. Makundi and J.E. sariah	Journal of Plant Diseases and protection	2005
73	Baseline Report of Project Sites in Ethiopia and Tanzania: Market Oriented Approaches for integrated management of Soil Water and Nutrient for crops in Eastern and Central Africa.	Regassa, S., Ikerra S.T., Hela J., Ley G., Getachew A., Razakamiaramanana, Serge J.	ASARECA/SWMnet/ICRISAT	2005
123	Conversion of Six Cultivars of Normal Open Pollinated Maize (OPV) to Quality Protein Maize in Tanzania .	Kitenge K.M. D. Kirubi, & Z.O. Mduruma .	Proceedings of “ Biotechnology, Breeding and Seed Systems for African Crops” workshop held at Safari Park hotel, Nairobi- Kenya	2005
95	IN. Lucile Teemba. Research & Development on indigenous fodder trees and shrubs. World Agroforestry Centre Eastern and Central Africa Regional Programme (ICRAF-ECA). ECA Working paper No. 5 pg 35-46	Lyamchai, C. J. , M. Kingamkono, C. Wambugu, J. Stewart and S. Franzel.	Paper presented to the Seventh Meeting of Agricultural Scientists. Held on 4 th – 6 th May 2005, Reduit Mauritius	2005
94	Indigenous forage shrubs and trees in zero grazing systems of northern Tanzania	Kingamkono, M.N., Lyamchai, C. J. ; Mansoor, H.; Sayula, G.; Masenge, S.; Latonga, P. ; and Mugunda, D.	Lucile Teemba. Research & Development on indigenous fodder trees and shrubs. World Agroforestry Centre Eastern and Central Africa Regional Programme (ICRAF-ECA). ECA Working paper No. 5 pg 35-46	2005
93	Integrating the Gender factor into the approaches for natural resource management in the Baga watershed Lushoto Tanzania .	Kingamkono, M. N, T. E. Mmbaga and C. J. Lyamchai.	Final report to ECAPAPA, Entebe Uganda	2005

92	Ongeza Maziwa na Upunguze Gharama kwa Kulisha Mifugo Kaliandra. A Booklet for small-scale dairy farmers.	Lyamchai, C. J. , E. S. Kweka, M. M. Mwikari, M. N. Kingamkono and C. Wambugu.	World Agroforestry Center (ICRAF), Nairobi .	2005
72	Preliminary Inventory of Best- Bets: Market Oriented Approaches for integrated management of Soil Water and Nutrients for crops in Eastern and Central Africa.	Ley G., Ikerra S.T., Regassa, S., Getachew A., Razakamiamanana, Serge J., Mati B.	ASARECA-SWMnet Technical Paper 6.	2005
124	The status Quality Protein Maize in Tanzania .	Kitenge K.M. and Z. Mduruma,	Proceedings of the' International Plant Breeding Symposium "workshop held in Mexico City.	2005
122	Advanced evaluation yield trials for drought and low-N tolerant maize varieties for mid altitude areas of Tanzania .	Kitenge K.M. Mduruma Z.O. & Matowo P.R.	Proceedings of "Resilient crops for Water Limited Environments" workshop held at Cuernavaca , Mexico.	2004
143	Allelism of resistance genes to Phaeosphaeria nodorum in wheat.	Kuwite, C.A and Hughes, G.R. 2004.	In: Proceedings of the 12th Regional Wheat Workshop for Eastern, Central and Southern Africa, Nakuru, Kenya, 22-26 November 2004. CIMMYT.	2004
96	Attitude Change for Effective Natural Resources Management and Development: Who Should Change?	Mowo, J.G., Shemdoe, R.S., Lyamchai, C.J. and Sellungato, M.	Proceedings of the Regional AHI Conference on Integrated Natural Resource Management in Practice: Enabling Communities to improve Mountain Livelihoods. 12 – 15 October 2004; Nairobi, Kenya.	2004
137	Improved fallows for soil fertility improvement at Tabora in western Tanzania: a synthesis. Proceedings of the Regional Agroforestry Conference on Agroforestry Impacts on Livelihoods in Southern Africa:	Gama, B.M.;Otsyina, R.;Nyadzi, G.I.;Banzi, F.;Shirima, D.S.;Mumba, M. 2004	Putting Research into Practice p. 131-140	2004
97	Scaling up the promotion of Calliandra in northern Tanzania.	Ms Kingamkono, C. J. Lyamchai, P. Latonga, E. Kweka, G. Sayula, R. Marandu, C. Wambugu, J. Stewart and S. Franzel.	IN. Proceedings of the Workshop on Scaling up the Promotion of Fodder trees. Held in Nairobi	2004

74	The African Network for Soil Biology and fertility: New Challenges and Opportunities.	Bationo, A., Kimetu, J., Ikerra, S.T., Kimani, S., Mugendi, D., Odendo, M., Silver, M., Swift, M.J., and Sanginga	In: Managing Nutrient Cycles to Sustain Soil Fertility in Sub Saharan Africa. Academy Science Publisher pp. 1-23.	2004
8	TXD 85 and Line 85: New high yielding varieties with acceptable grain quality in Tanzania.	Kanyeka, Z.L., Kibanda, J.M., Msomba, S.W. and Tusekelege	IRRN 29(1): 29-30pp.	2004
50	TXD 85 and TXD 88New high yielding rice varieties with acceptable grain quality in Tanzania	Z.L.Kanyeka, JM Kibanda,S.W.Msomba,H.Tusekelege	International Rice Research Notes:IRRI 29:1:29 pg	2004
7	TXD306 - a high yielding and medium-maturing aromatic rice for the rainfed lowland and irrigated ecosystems in Tanzania.	Msomba, S.W., Kibanda, J.M., Tusekelege, H., Mkuya, M., Kafiriti, E., Mbapila and Kanyeka, Z.L.	IRRN 29(1): 30-31pp.	2004
51	TXD306 medium high yielding aromatic rice for rainfed and irrigated ecosystems in Tanzania	Z.L.Kanyeka, JM Kibanda,S.W.Msomba,H.Tusekelege,E.Kafiriti,JC Mbapilla	International Rice Research Notes:IRRI 29:1:30 pg	2004
49	Cashew farm upgrading. Knowledge transfer for sustainable tree crop development: a case history of the Tanzanian Integrated Cashew Management Programme	Kasuga L. J, Bashiru, R. A. and Martin P.J.	<i>Biohybrids Agrisystems Ltd, ISBN Number 0-9545192-0-5</i>	2003
81	Earliness in maturity and semi dwarfness in barley induced through mutation:FAO/IAEA International symposium on induced mutation in Plants	Mamuya,I.N., Ngulu O.F., Sechonge,S.A.J. and Shekibula,R.B.	Vienna,Austria,IAEA	2003
34	Integrated Pest Management in Tanzania	Nyambo, B. T., Varela, A. M., Seguni, Z and Kirenga, G.	In: Maredia, K. M., Dakoua, D. and Mata-Sanchez, D. (eds) Integrated Pest Management in the Global Arena, Chap 13. CABI Publishing, CAB International, Wallingford, Oxon OX10 8DE	2003

48	Knowledge transfer for sustainable tree crop development: a case history of the Tanzanian Integrated Cashew Management Programme, Published by	Topper, C. P. and Kasuga L. J.	<i>Biohybrids Agrisystems Ltd, ISBN Number 0-9545192-0-5</i>	2003
128	Labour saving under CA technologies	Clare Bishop, Josef Kinzle, Fatima Ribeiro, Wilfred Mariki and Marietha Owenya	IFAD/FAO Publications	2003
155	Rapid Rural Appraisal Report for Ng'aibara Village, Karatu District.	Ngatoluwa, R., Ndondi, R.V., and C.A. Kuwite 2003	A Report presented to the Catholic Relief Services. Land Resource Management Programme,	2003
16	Rotational woodlot technology in northwestern Tanzania: Tree species and crop performance	Nyadzi, G.I., R.M.Otsyina., F.M.Banzi., S.S.Bakengesa., B.M.Gama., L.Mbwambo, and D.Asenga	Agroforestry Systems	2003
98	Sustainable functioning of the institute and internal service delivery.	Lyamchai, C. J. , F.J. Mwakanyamale and Chira Schouten.	Lema N. M; C. Schouten and T. Schrader (eds). Managing Research for Agricultural Development. Proceedings of the National Workshop on Client Oriented Research. 27-28 May 2003, Moshi , Tanzania .	2003
47	Technology adoption rates and the success of knowledge transfer to ICMP and non-ICMP farmers.	Katinila N. A, Mfilinge A, Kasuga L. J. and Topper C. P.	Biohybrids Agrisystems Ltd, ISBN Number 0-9545192-0-5	2003
17	Water and nitrogen dynamics in rotational woodlots of five tree species in western Tanzania	Nyadzi, G.I., R.M. Otsyina, H.W.G. Boolttink, C.K. Ong, and O. Oenema	Agroforestry Systems	2003
142	A Synthesis of Research and Development of the Rotational Woodlots Technology in Tanzania	R Otsyina, GI Nyadzi, L Mbwambo, FS Banzi, MS Mumba, DS Shirima, SS Bakengesa and BM Gama	Paper presented to the 11 th African Crop Science Conference, Nairobi, Kenya	2002
115	Adoptable maize/legume systems for improved maize production in northern Tanzania.	Mmbaga.T.E. 2002.		2002
44	Cashew Mealybug. A new Foe to cashew Farmers.	Sijaona, M.E.R.	<i>SANET Newsletter</i>	2002

116	Development, evaluation and dissemination of stress tolerant maize in Tanzania.	Z.O. Mduruma, P.R. Matowo and T.E. Mmbaga	Annual collaborators workshop for SADLF Project – 22-29 September Lusaka Zambia	2002
157	Dividend as a seed treatment fungicide in wheat in northern Tanzania.	Kuwite, C.A 2002	A report to the NPCC, TPRI Tanzania.	2002
102	Drought management options for maize production in drought prone areas of northern zone of Tanzania.	Mmbaga T.E. and C. J. Lyamchai.	In Proceedings of the 7 th Eastern and Southern Africa regional maize conference and symposium on Low Nitrogen & Drought Tolerance in maize 5 th – 11 th February 2002. Nairobi , Kenya	2002
156	Evaluation of Dividend as a seed treatment fungicide in barley for northern Tanzania.	Kuwite, C.A. 2002	A report to the NPCC, TPRI Tanzania.	2002
45	Gaucha – A new insecticide for control of Sesame flea beetles <i>Alocypha bimaculata</i> , Jacoby in southern Tanzania.	O.K.K. Mponda and E.M. Kafiriti	<i>SANET Newsletter</i>	2002
35	Incidence, distribution and economic importance of the coconut eriophyid mite, <i>Aceria guerreronis</i> Keifer in Tanzanian coconut cropping systems	Seguni, Z	Incidence, distribution and economic importance of the coconut eriophyid mite, <i>Aceria guerreronis</i> Keifer in Tanzanian coconut cropping systems	2002
138	On-farm evaluation of <i>Sesbania sesban</i> (L.) Merr. and <i>Tephrosia vogelii</i> (Hook. f.) improved fallows for improving maize production in Tabora, Tanzania.	Gama BM, Otsyina R, Shirima DS, Nyadzi, GI Mumba, MS and Mwageni W. (2002	Paper presented at the Regional Agroforestry Conference, Warmbaths, South Africa 20-24 May, 2002.	2002
46	Sesame varietal improvement in Tanzania.	Mponda, O.K. and E.M. Kafiriti	<i>SANET Newsletter</i>	2002
101	The influence on customs and traditions on gender relations and quality of life on slopes of mount Kilimanjaro.	Kingamkono, M.N. and C. J. Lyamchai.	Paper presented to the Mountains High Summit Conference for Africa . Held in Nairobi	2002
121	The introduction of Quality Protein Maize in Tanzania.	Kitenge K.M. and Mduruma Z.O	A paper presented on workshop held at Golden Rose Hotel – Arusha.	2002

100	The Many Faces of collective Action: How people come together for Innovation, Marketing and Natural Resource Management. The case of farmer groups on the slopes of Mount Kilimanjaro in northern Tanzania	Adolf F. Makauki, C. J. Lyamchai , Frank Place , Justine Wangila, Gatarwa Kariuki.	Paper presented to the Mountains High Summit Conference for Africa . Held in Nairobi	2002
99	The role of livestock in poverty alleviation on the slopes of mount Kilimanjaro.	Kingamkono, M.N. and C. J. Lyamchai . 2002.	Paper presented at the 6 th African Mountain Association (AMA) conference. Held in Moshi	2002
43	Wilt syndrome threatens cashew farmers in Southern Tanzania	Sijaona, M.E.R.	<i>SANET Newsletter</i>	2002
141	Agroforestry and Environment. Tanzania.	DS Shirima, REA Swai, S. Ruvuga and R. Otsyina	Proceedings of the Workshop on Strategies to Scale up Agroforestry Technologies for Policy Makers and other Partners in Tabora,	2001
159	Control of soil-borne and foliar diseases of barley using seed treatment and foliar fungicide application in northern Tanzania. Tanzania	Kuwite, C.A. 2001	A report to the NPCC, TPRI	2001
160	Evaluation of seed treatment foliar fungicides in controlling wheat diseases in northern Tanzania.	Kuwite, C.A.2001.	A report to the NPCC, TPRI Tanzania	2001
117	Experiences of moisture conservation in maize production using tied ridges in moisture stressed areas of the northern zone.	Mmbaga, T.E. 2001.	In: Proceedings of the National Conservation Tillage workshop for sustainable land management. 23rd – 25 th July 2001, Arusha, Tanzania	2001
104	Impact of Soil Conservation Measures on Soil Quality.	Ngatoluwa, R. T.; H. A. Mansoor and C.J. Lyamchai .	Paper presented to the National Soil Tillage Workshop, Arusha Tanzania .	2001
41	In vitro micrografting of cashew (<i>Anacardium occidentale</i> L)	Mneney, E. E. and Mantell, S. H	Plant Cell, Tissue and Organ culture Journal	2001
158	Insecticide control of aphid vectors of barley yellow dwarf virus in barley.	Kuwite, C.A. 2001	A report to the NPCC, TPRI Tanzania	2001

126	Integrated farming techniques for sustainable wheat production at Hanang wheat farms, Northern Tanzania	P. Antapa and W.L. Mariki	A paper presented at conservation tillage conference) July 23 rd -25 th , 2001 at Eland Hotel, Arusha, Tanzania	2001
103	Integrated soil fertility management (ISFM). Experiences of AHI in Lushoto, Tanzania.	Mowo, J.G., Wickama, J. M and C. J. Lyamchai .	In Wickama et al 2001. Integrated soil fertility management in the Eastern Zone of Tanzania. Proceedings of a workshop held in Tanga Tanzania	2001
118	Managing Persistent drought through Ndiva-The micro-dams. Participatory Rural Appraisal of Eastern lowland of Same District.	Z.O. Mduruma, V. Akulumuka, T.E. Mmbaga and L.C. Mushi. 2001.	Ministry of Agriculture and Food Security.	2001
5	Rice Insect pests of economic importance in Tanzania. A Review:	Kibanda, N.J.M.	Proceedings of a workshop on Rice Research in Kenya, Malawi, Zambia and Tanzania, held at KATC Chekereni compound Moshi, Tanzania	2001
40	Rural seed fairs as an alternative way of seed acquisition in southern Tanzania.	Kafiriti, E.M., Mponda, O.K.K.	<i>Tanzania Agricultural Research and Training Newsletter.</i>	2001
140	SADC/ICRAF Agroforestry Research Project.	Swai, R.E.A., D. Shirima, B. Gama., M. L. Kusekwa, Mbwambo, L. and G. Nyadzi	Annual Progress 2001, AFRENA Report.	2001
127	The effect of sub-soiling hard pans soils and using cover crops to soil fertility and crop yields in Hanang and Karatu districts in Northern Tanzania	W.L. Mariki	A paper presented at conservation tillage conference) July 23 rd -25 th , 2001 at Eland Hotel, Arusha, Tanzania	2001
42	Use of random amplified polymorphic DNA (RAPD) markers to reveal genetic diversity within and between populations of cashew (<i>Anacardium occidentale</i> L).	Mneney, E. E., Mantell, S. H and Mark, B.	Journal of Horticultural Science and Biotechnology	2001

136	Effect of natural and Sesbania fallows and crop rotations on the incidence of root-knot nematodes and tobacco production in Tabora, Tanzania.	Shirima, D. S., R. Otsyina, W. P. Mwageni and J. Bridge, 2000.	International Journal of Nematology Vol. 10, No. 1 pp 49-54	2000
120	Evaluation of Glyphosate and Rondopaz for minimum tillage in Wheat production in Northern Tanzania.	Mmbaga T.E.	Tropical Pests Management Bulletin, Vol. 1 Number 1. Tropical Pesticides Research Institute, Arusha , Tanzania.	2000
20	Forage and seed yields, mortality and nutritive of Sesbania sesban under unimodal rainfall in Tanzania	Karachi M., and Matata. Z	Journal of Tropical Forest Science	2000
161	Participatory Rural Appraisal in Mandachini Village, Rombo District, Tanzania. Selian Agricultural Research Institute.	Kuwite, C.A and Kweka, S.O. (eds) 2000		2000
119	Participatory Rural Appraisal in Mdawi village, Moshi Rural district in Kilimanjaro Region.	Mmbaga T.E. , N. Munisi, M Chottah, D. Kilambo, December,		2000
139	SADC/ICRAF Agroforestry Research Project.	Otsyina R., R. Msangi, B. Gama, T. Ramadhani, G. Nyadzi and D. Shirima, M. L. Kusekwa	Annual Progress 2000, AFRENA Report.	2000
107	Seeing is Believing. A report on Kilimanjaro Farmers' visit to Embu and Maseno ,	Kingamkono N. M. and C. J. Lyamchai.	Unpublished. Selian Agricultural Research Institute.	2000
75	Soil Biology and Fertility Research Activities in Tanzania.	Ikerra, S.T., M.C. Kalumuna, A.E., Marandu, Wickama J., G. Ley	TSBF Programme. Report No 10	2000
106	Timing Nitrogen Application to Enhance Wheat Grain Yield in Northern Tanzania .	Mugendi, M., C. J. Lyamchai , W. Mariki and M. Israel.	In CIMMYT 2000. The Eleventh Regional Wheat Workshop for Eastern Central and Southern Africa . Addis Ababa Ethiopia ,	2000
108	We saw and will do it. A report on Lushoto Farmers' visit to Embu and Kisii , Kenya	Kingamkono N. M. and C. J. Lyamchai.	Unpublished. Selian Agricultural Research Institute	2000

61	Adaptation and yield of pigeonpea in different environments in Tanzania. Field Crop research 94 (2005): 43-53. (Elsevier B.V. 2004).	J.K. Mligo and P.Q. Craufurd (2005).		
149	Artea 330EC for the Control of Foliar Diseases of Barley in Northern Tanzania.	C.A Kuwite, L.J Mlay and C.E Msuya. 2007	A report to the National Pesticides Registration Committee, Ministry of Agriculture, Food Security and Cooperatives, Tanzania.	
62	Cropping systems, uses and primary in situ characterization of Tanzanian pigeonpea (Cajanus cajan (L.) Millsp.) landraces. Genetic resources and Crop Evolution. 52:645-654.	S.N. Silim, P.J. Bramel, H.B. Akonaay, J.K. Mligo and J.L. Christiansen.(2005).		
53	Effect of Minjingu Phosphate Rock and Triple Super Phosphate as Phosphorus sources in Semi-Arid Lands of Central Tanzania. <i>East Africa Agriculture and Forest Journal (In press)</i> .	Mkangwa, C.Z. (2003).		
71	Effects of Gypsum and Lime on Subsurface Acidity and Phosphorus Utilization by Plants Grown on an Acid Soil in Magadu, Morogoro, Tanzania. M.Sc. Dissertation. Sokoine University of Agriculture, Morogoro, Tanzania. pp 88.	H.B.Msita(2003)		
59	Effects of total inorganic N and P availability on Maize Yields in the First post Tephrosia vogelii fallow. In: Advances in Integrated Soil Fertility Management in Sub-Saharan Africa: Challenges and Opportunities (Edited by Bationo, A., Waswa, B., Kihara, J. and Kimetu, J.). pp 787-793. Springer, Dordrecht, The Netherlands.	Mkangwa, C.Z., Maliondo, S.M.S. and Semoka, J.M.R (2007).		

55	Enhancing nutrient accumulation of <i>Tephrosia vogelii</i> Fallow through Minjingu Phosphate Rock Applications on Acidic P deficient Ferralsol of Eastern Tanzania. Discovery and Innovation. 19, 59-66.	Mkangwa, C.Z., Maliondo, S.M.S. and Semoka, J.M.R (2007).		
69	Importance of Biosafety in Biotechnology. In Proceedings of the 2 nd National Plant Genetic Resources and Biodiversity, Arusha	C.E. Rutaihwa(2002)		
63	Improved pigeonpea varieties. In: Tarimo, A.J.P., Batamuzi, E.K. and Kawamala, P.M.(eds). Improving crop production. Research Dissemination Series. Volume 1. TARP II – SUA Project 2004.	J.K. Mligo, Mbwaga, A.M, Katundu, J.M. and Myaka, F.A. (2004).		
54	Influence of <i>Tephrosia vogelii</i> fallow-maize rotation on soil fertility regeneration and maize yield in sub-humid climate of eastern Tanzania. Proceedings of the 21 st Conference of the Soil Science Society of East Africa, Eldoret, Kenya. (<i>In press</i>).	Mkangwa, C.Z., Semoka, J.M.R. and Maliondo, S.M.S. (2003).		
56	In-Situ Fertilizer Industry for Small Scale Farmers: The Case of <i>Tephrosia vogelii</i> Fallow and Minjingu Phosphate Rock in Eastern Tanzania. Discovery and Innovations, 21, 104-110.	Mkangwa, C.Z., Maliondo, S.M.S. and Semoka, J.M.R (2009).		

65	<i>In-station research, technology exchange and seed systems for pigeonpea in Tanzania. In: Silim, S.N., Mergeai, G., and Kimani, P.M. (eds). Status and potential of pigeonpea in Eastern and Southern Africa: proceedings of a regional workshop, 12-15 Sep 2000, Nairobi, Kenya, B-5030 Gembloux, Belgium: Gembloux Agricultural University; and Patncheru 502 324, Andhra Pradesh, India ICRISAT.</i>	J.K. Mligo, F.A. Myaka, A. Mbwaga and B.A. Mpangala (2001).		
70	Multilocation Evaluation of Sunflower Varieties for High Seed Yield and Oil Contents. In: Batamuzi, E.K., Tarimo, A.G.P. and Kinabo, L.D.B. Proceedings of the 3 rd collaborative research workshop, Morogoro, TARP II- SUA Project.	C.E. Rutaihwa, C.E. Chilagane and J.Y. Chambi (2004)		
60	Productivity and optimum plant density of pigeonpea in different environments in Tanzania. Journal of Agricultural Science (2007). 145: 343-351. Cambridge University Press.	J.K. Mligo		
64	Release of a fusarium wilt resistant long-duration pigeonpea variety Mali. (Limited circulation).	J.K. Mligo, S. Lymo and Mbwaga, (2002).		
58	Response of <i>Tephrosia vogelii</i> to Minjingu phosphate rock application on a Ferralsol of varying soil pH. In Managing Nutrient Cycles to Sustain Soil Fertility in Sub-Saharan Africa, (Edited by: A. Bationo), pp 249-260. Academy Science Publishers, Nairobi, Kenya.	Mkangwa, C.Z., Semoka, J.M.R. and Maliondo, S.M.S. (2004).		
68	<i>Starch digestibility of porridges from unrefined and refined maize, pearl millet and sorghum. M.Sc. Thesis, Pretoria University, Republic of South Africa</i>	S.T.P Kundi (2001)		

57	Success stories: A case of adoption of improved varieties of maize and cassava in Kilosa and Muheza districts, eastern Tanzania. (Submitted to Journal of Agricultural Science and Technology)	Mkangwa, C.Z., Kyakaisho, P.K. and Milaho, C. (2010).		
67	The crop, the pests and their management. In Management of Selected Crop Pests in Tanzania. (Chief Editor Rhodes H. Makundi). Pp 33 - 47. Tanzania Publishing House Limited, Dar es Salaam.	R.H. Makundu and F.P.Mrosso(2006)		
66	Towards an understanding of the adaptation of pigeonpea [Cajanus cajan (L.) Millsp.] in Tanzania. Ph.D. Thesis. The University of Reading. UK.	J.K.Mlilo (1998).		

Annex G: SUA Undergraduate and Postgraduate Enrollments

Table G.1. Undergraduate Enrollments by Specialization and Gender, 2001/02 to 2005/2006

	2001/02			2002/03			2003/04			2004/05			2005/06		
DEGREE PROGRAMME	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T
B.Sc. Agriculture General	36	170	206	38	199	237	40	208	248	34	172	206	35	153	188
B.Sc. Forestry	26	128	154	25	125	150	15	149	164	28	140	168	19	117	136
B.Sc. Home Econ and Human Nutrition	115	114	229	192	56	248	194	49	243	191	58	249	149	80	229
Bachelor of Veterinary Medicine	21	131	152	24	139	163	17	124	141	23	166	189	18	111	129
B.Sc. Food Sc. and Tech.	60	157	217	75	162	237	93	172	265	71	165	236	75	122	197
B.Sc. Agricultural Engineering	0	85	85	9	121	130	9	99	108	14	142	156	18	117	135
B.Sc. Horticulture	34	42	76	40	51	91	45	64	109	36	71	107	27	66	93
B.Sc. Animal Science	27	151	178	34	168	202	34	187	221	27	141	168	44	81	125
B.Sc. Agronomy	5	90	95	12	112	124	18	107	125	15	105	120	10	89	99
B.Sc. Agric. Education and Extension	26	110	136	31	115	146	36	107	143	37	135	172	39	137	176
B.Sc. Agric. Econ. And Agribusiness	64	145	209	59	126	185	53	134	187	47	190	237	54	158	212
B.Sc. Wildlife Management	52	129	181	43	117	160	36	107	143	46	125	171	34	113	147
B.Sc. Environmental Sc. Mgt	47	79	126	69	105	174	70	112	182	73	131	204	63	142	205
B.Sc. Biotechnology and Lab. Sci.	0	0	0	0	0	0	0	0	0	7	29	36	15	56	71
B.Sc. Aquaculture	0	0	0	0	0	0	0	0	0	8	19	27	14	41	55
B.A. Rural Development	0	0	0	0	0	0	0	0	0	0	0	0	43	20	63
TOTAL	513	1531	2044	651	1596	2247	660	1619	2279	657	1789	2446	657	1603	2260
% Female	25			29			29			27			29		

Table G.2. Undergraduate Enrollments by Specialization and Gender, 2006/07 to 2010/2011

	2006/07			2007/08			2008/09			2009/10			2010/11		
FIELD OF STUDY	F	M	T	F	M	T	F	M	T	F	M	T	F	M	T
B.Sc. Agriculture General	30	165	195	23	102	125	19	118	137	13	94	107	22	93	115
B.Sc. Forestry	20	114	134	26	128	154	19	126	145	12	67	79	14	96	110
B.Sc. Home Econ and Human Nutrition	156	59	215	159	32	191	144	42	186	42	11	53	0	0	0
Bachelor of Veterinary Medicine	15	102	117	10	80	90	9	101	110	5	73	78	9	53	62
B.Sc. Food Sc. and Tech.	18	109	127	73	67	140	67	66	133	27	27	54	50	41	91
B.Sc. Agricultural Engineering	9	99	108	8	101	109	5	79	84	1	29	30	1	26	27
B.Sc. Horticulture	27	55	82	14	31	45	17	43	60	3	22	25	14	35	49
B.Sc. Animal Science	22	96	118	16	84	100	26	110	136	20	71	91	23	101	124
B.Sc. Agronomy	11	90	101	9	60	69	10	64	74	5	90	95	16	57	73
B.Sc. Agric. Education and Extension	43	153	196	54	163	217	55	186	241	36	83	119	0	0	0
B.Sc. Agric. Econ. And Agribusiness	53	175	228	63	172	235	75	244	319	46	155	201	68	212	280
B.Sc. Wildlife Management	43	124	167	36	123	159	38	143	181	24	69	93	15	88	103
B.Sc. Environmental Sc. Mgt	57	138	195	57	104	161	52	81	133	24	52	76	50	43	93
B.Sc. Biotechnology and Lab. Sci.	26	72	98	22	61	83	22	95	117	18	70	88	25	64	89
B.Sc. Aquaculture	18	61	79	13	48	61	18	63	81	7	25	32	11	56	67
B.A. Rural Development	43	106	149	87	215	302	140	295	435	77	140	217	133	140	273
B.Sc. Range Management	0	0	0	0	0	0	1	27	28	7	26	33	7	51	58
B.Sc. Tourism Management	0	0	0	0	0	0	43	42	85	68	56	124	104	111	215
B.Sc. Informatics	0	0	0	0	0	0	9	53	62	3	41	44	7	33	40
B.Sc. Education	0	0	0	0	0	0	34	144	178	49	180	229	41	215	256
B.Sc. Applied Agric. Extension	0	0	0	0	0	0	0	0	0	0	0	0	30	98	128
B.Sc. Agricultural Education	0	0	0	0	0	0	0	0	0	0	0	0	29	51	80
B.Sc. Family and Consumer studies	0	0	0	0	0	0	0	0	0	0	0	0	23	11	34
B.Sc. Human Nutrition	0	0	0	0	0	0	0	0	0	0	0	0	37	48	85
B.Sc. Bio-processing & post-harv eng.	0	0	0	0	0	0	0	0	0	0	0	0	1	6	7
B.Sc. Irrigation & water resource eng.	0	0	0	0	0	0	0	0	0	0	0	0	3	52	55
TOTAL	591	1718	2309	670	1571	2241	803	2122	2925	487	1381	1868	733	1781	2514
% Female	26			30			27			26			29		

Table G.3. Undergraduate Enrollments by Program: Growth, Percentage of Female Students, and Percentage of Total 2010/2011 Enrollment

FIELD OF STUDY	Growth/yr		Female as % of 2011 Tot.		2011 Enrollment	
	%	Rank	%	Rank	as % Tot	Rank
B.Sc. Agric. Econ. & Agribusiness	3.3%	1	24.3%	10	11.1%	1
B.Sc. Agric. Education Extension a/	-1.7%	2	N/A		N/A	
B.Sc. Agronomy	-2.9%	3	21.9%	12	2.9%	15
B.Sc. Environmental Sc. & Mgt.	-3.3%	4	53.8%	3	3.7%	10
B.Sc. Forestry	-3.7%	5	12.7%	21	4.4%	8
B.Sc. Animal Science	-3.9%	6	18.5%	14	4.9%	6
B.Sc. Horticulture	-4.8%	7	28.6%	8	1.9%	20
B.Sc. Wildlife Management	-6.1%	8	14.6%	18	4.1%	9
B.Sc. Agriculture General	-6.3%	9	19.1%	13	4.6%	7
B.Sc. Food Sc. & Technology	-9.2%	10	54.9%	2	3.6%	11
B.Sc. Veterinary Medicine	-9.5%	11	14.5%	19	2.5%	17
B.Sc. Agricultural Engineering	-12.0%	12	3.7%	24	1.1%	23
B.Sc. Home Econ. & Hum. Nut. a/	-16.7%	13	N/A		N/A	
BSc Tourism Management	36.3%	1*	48.4%	5	8.6%	4
B.A. Rural Development	34.1%	2*	48.7%	4	10.9%	2
BSc Range Management	27.5%	3*	12.1%	22	2.3%	18
B.Sc. Aquaculture	16.4%	4*	16.4%	16	2.7%	16
B.Sc. Biotechnology & Lab. Science	16.3%	5*	28.1%	9	3.5%	12
BSc Education	12.9%	6*	16.0%	17	10.2%	3
BSc Informatics	-13.6%	7*	17.5%	15	1.6%	21
B.Sc. Applied Agric. Extension			23.4%	11	5.1%	5
BSC Family and consumer studies			36.3%	7	3.2%	14
BSc Irrigation and water resources Eng			67.6%	1	1.4%	22
BSc Agriculture Education			43.5%	6	3.4%	13
B.Sc Human Nutrition			14.3%	20	0.3%	24
BSc Bioprocess and Post Harvest Eng			5.5%	23	2.2%	19
Total			29.2%			
a/ For 2001/02 through 2009/10						

Note: The programs above the double line were underway as of 2001/02. Below the double line, Biotech and Aquaculture started in 2004/05; Rural Development started in 2005/06; Range Management, Tourism Management, Informatics, and Education started in 2008/09; and Family and Consumer Studies, Irrigation and Water Resources Engineering, Agriculture Education, Human Nutrition, and Bioprocess and Post-Harvest Engineering started in 2010/2011. Ranks for growth/year are calculated separately for programs that started more recently than 2003/04, as indicated by the asterisks.

Table G.4. Postgraduate Enrollments by Program, 2008/09 to 2010/2011

	2008/09					2009/10					2010/11				
POSTGRADUATE DEGREE	M.Sc.		PhD		Total	M.Sc.		PhD		Total	M.Sc.		PhD		Total
	M	F	M	F		M	F	M	F		M	F	M	F	
MSc. (Agricultural Economics)	37	8	4	3	52	25	11	4	5	45	27	7	4	1	39
MBA (Agribusiness)	20	6	-	-	26	16	6	-	-	22	25	7	-	-	32
M.Sc. (Crop Science)	10	2	1	1	14	22	10	3	-	35	15	6	2	1	24
M.Sc.(Tropical Animal Production)	6	2	1	-	9	19	2	3	-	24	12	3	-	1	16
M.Sc. (Agric Engineering)	(Not yet introduced)					5	-	-	-	5	4	-	1	1	6
M.Sc. (Land Use and Planning Management)	6	1	-	-	7	-	-	1	-	1	-	-	-	-	-
M.Sc.(Agricultural Education & Extension)	9	2	-	-	11	16	6	-	1	23	9	5	-	-	14
M.Sc.(Soil Science)	8	2	-	-	10	2	-	-	-	2	1	2	15	3	21
M.Sc.(Human Nutrition)	-	7	-	-	7	2	3	-	-	5	-	-	-	-	-
M.Sc. (Food Science)	1	-	-	-	1	5	1	-	-	6	12	6	3	-	21
M.Sc.(Forestry)	7	4	-	-	11	13	2	1		16	2	2	-	-	4
M.Sc.(Management of Natural Resources for Sustainable Agriculture-MNRSA)	14	3	-	-	17	15	6	-	-	21	23	11	-	-	34
M.Sc.(Wildlife Management)	3	2	-	-	5	3	4	-	-	7	3	-	-	-	3
Masters in Veterinary Medicine (MVM)	2	1	1	-	4	1	-	4	2	7	1	-	-	3	4
Masters of Preventive Veterinary Medicine(MPVM)	7	1	-	-	8	2	-	-	-	2	2	-	-	-	2
M.Sc. Veterinary Medicine in Public Health	(Not yet introduced)					27	12	-	-	39	23	5	-	-	28
Masters of Arts Rural Development (MARD)	44	21	3	2	70	43	18	5	1	67	32	26	5	4	67
TOTAL	174	62	10	6	252	216	81	21	9	327	191	80	30	14	315

Table G.5. Postgraduate Enrollments by Program: Growth, Percentage of Female Students, and Percentage of Total 2010/2011 Enrollment

	Growth		% of Total		% Female Enrollment	
Degree Programme	Rate/year	Rank	Enrollment	Rank	2010/11	Rank
M.Sc. (Food Science)	175.9	1	6.7	6	28.6	7
M.Sc.(Soil Science)	28.1	2	6.7	7	9.5	13
M.Sc.(Management of Natural Resources for sustainable Agriculture-MNRSA)	26.0	3	10.8	3	32.4	5
M.Sc.(Tropical Animal Production)	21.1	4	5.1	8	25.0	8
M.Sc. (Crop Science)	19.7	5	7.6	5	29.2	6
M.Sc.(Agricultural Education & Extension)	8.4	6	4.4	9	35.7	4
MBA (Agribusiness)	7.2	7	10.2	4	21.9	9
Masters in Veterinary Medicine (MVM)	0.0	8	1.3	10	75.0	1
Masters of Arts Rural Development(MARD)	-1.4	9	21.3	1	44.8	3
MSc. (Agricultural Economics)	-9.1	10	12.4	2	20.5	10
M.Sc.(Wild Life Management)	-15.7	11	1.0	12	N/A	N/A
M.Sc.(Forestry)	-28.6	12	1.3	11	50.0	2
Masters of Preventive Veterinary Medicine(MPVM)	-37.0	13	0.6	13	N/A	N/A
M.Sc. (Land Use and Planning Management)	N/A	N/A	N/A	N/A	N/A	N/A
M.Sc. Veterinary Medicine in Public Health	N/A	N/A	N/A	N/A	17.9	11
M.Sc. (Agric Engineering)	N/A	N/A	N/A	N/A	16.7	12
M.Sc.(Human Nutrition)	N/A	N/A	N/A	N/A	N/A	N/A

N/A indicates programs that were in existence for only two of the three years, either because they did not start until 2009/10, or were apparently suspended in 2010/11.

Annex H: SUA Research Programs and Outputs

Table H.1. Current Research Projects Funded by External Partners, Faculty of Agriculture, SUA

Project	Project Leader	Source of Funds	Commencement Date	End Up Date	Total Grant Value
Productivity and Growth in Organic Value-Chains	Prof.K.Sibuga	DANIDA	Jan,2011	Mar,2015	DKK 2,174,817
Enhancing Children Nutrition and Rural Livelihoods in Malawi Mozambique	Prof.Y Muzanila	Mcknight Foundation	Aug,2009	Sept,2013	USD 240,000
ECABREN (Phase II)	Dr Mamiro	ASARECA	Jan,2010	Mar,2013	Depends on Activities
Development of a Sustainable Tilapia Culture in Tanzania	Dr.S.W.Chenyambuga	University of Arkansas	Jan,2008	Sept,2011	USD 62,000
Processing for commercial Exploitation of Selected Tree fruits and Vegetable	Prof.B.Tisekwa	ASARECA	Oct,2009	June, 2011	USD 196,000
Drying Fruits and Vegetable	Dr (Mrs) A.Temu	DANIDA	July,2009	June,2012	DKK 3,000,000
Plant Breeding Marker Assisted Selection (MAS)	Prof,Nchimbi Msola	KIRKHOUSE TRUST	Sept,2008	August,2011	USD 188,394,866
Promoting Sustainable Natural resources Mgt through Effective Governance and Farmer –Mkt Linkages	Dr. D.Kimaro	ASARECA	July,2009	Dec,2011	USD 104,548
Advancing Soil Health in Africa	Dean, Faculty of Agriculture	Allience for Green Revolution in Africa	Jan,2010	Dec,2015	USD 1,867,497
Seed Disease Diagnosis	Prof. R. Mabagala	VARIOUS STAKEHOLDER	Jan,2008	Dec,2012	NO SPECIFIC BUDGET
Market Infastructure Improvement (Phase II)	Dr (Mrs) Anna-Temu	IFPRI-Washington	Nov,2008	Mar,2011	USD 58,000
Improved Utilization of Sorghum and Pearl Millet in Ease Africa	Dr. J.J.Mpagalile	INSTOMIL	July,2006	Sept,2011	USD 120,600
Market Development in Support of Sorghum and Millet Farmers in Tanzania and Zambia	Dr. E.Mbiha	Ohio State University Research Foundation	Sept,2007	Sept,2011	USD 51,103
Intergrated Pest Management (IPM)	Prof.Maerere	The Ohio State University	Oct,2009	Sept,2014	USD 180,410
Diagnotic and control Tool and Strategies for Taenia Solium Cyticercosis	Prof. F.Lekule	ASARECA	July,2009	June, 2010	USD 85,000

Poverty and Sustainable Development Impacts of REDD Architecture (Phase II)	Prof.G.Kajembe	II ED		May,2013	NOKK456,950
Exploiting Markets for Dairy and Meat Product Quality and Safety	Prof. Kurwijila	ASARECA	Jan,2006	Dec,2011	USD 133,464
Improving livestock Productivity through development of Regional Fees data base	Prof. L.Mtenga	ASARECA	Jan,2006	Dec,2011	USD 62,430
Rural-Urban Complementarities of Poverty (RUCROP)	Dr. E.Lazaro	DANIDA	July,2010	June,2013	DKK 2,885,860
Efficient Utilization of Available Feed Resource to Improve Livestock in East Africa	Prof. A.Kimambo	ASARECA	Jan,2006	Dec,2011	USD 59,993.15
IGMAFU – Meat, Income Generation Thro.	Prof. A.Kimambo	ENRECA	Mar,2009	Mar,2013	DKK 1,628,684
Building Climate Change Adaption Capacity in the Agriculture Sector in Tanzania	Prof.K.Tarimo	Rockefeller Foundation	Dec,2010	Nov,2012	USD 400,000
Capacity Building for Nutritional Security	Prof (Mrs) J.Kinabo	UNICEF	Jan,2007	Dec,2011	USD 40,000
Exploiting African Seed Treatment Technology (Eclipta alba)	Prof.R.B.Mabagala	DANIDA	Jan,2010	Dec,2012	DKK 832,460
Drying of fruits and Vegetables,and development of market for poverty Alleviation.	Dr(Mrs)A. Temu	NUFU	July,2009	Dec,2012	NOKK 2,879,000
Increasing Value of African Mango and Cashewnuts	Dr. Mwatawala	DANIDA	Jan,2011	Dec,2014	USD 240,000
Seed Pathology Course Transfer Project	Prof.Mabagala	DANIDA	Jan,2002	Dec,2012	DKK 8,518,053
Contribution of milk value chain to Poverty Reduction in Tanzania	Dr, F.Kilima	IDRC	July,,2010	July,2013	CAD 163,900
Securing Rural Livelihoods Through Improved Small Holder Pig Production in Mozambique and Tanzania	Prof.F.P.Lekule	DANIDA	Jan,2010	June,2015	DKK 2,133,606
Evaluation of the Effect of Soil Fertility and Soil Quality in Nutritive Value of Some Crops in Selected physiographic Units of Mbeya Region	Dr.Nyambilila Amuri	RUFORUM	Sept,2010	Sept,2011	USD 59,994
Poultry Health for Development (PHD)	Dr. P.Msoffe	Regents of the University of California Davis	Jan,2009	Dec,2011	USD 43,000
Conservation Agriculture fot a restored Environment	Dr. D.Kimaro	VLIR	July,2009	June,2011	Euro 24,836.7
Managing Risk, Reducing Vulnerability and Enhancing Agricultural Productivity under changing climate	Prof.H.Mahoo	IDRC	Apr,2007	March,2011	CAD 1,626,100.00

Pulse CRSP Bean Nitrogen Fixation (BNF)	Prof (Mrs) Nchimbi Msolla	USAID	Oct,2010	Sept,2013	USD 98,741
Fruit fly Host Utilization	Dr.M.Mwatawallah	International Atomic Energy Agency (IAEA)	Ja,2010	Dec,2013	Euro 12,000
Livestock Enterprises	Prof.M.M.Mtambo	University of Copenhagen	Jan,2009	Dec,2012	DKK 3,000,000
PREPARE PHD	Prof. F.P. Lekule	University of Copenhagen	Aug,2008	July,2011	Euro 42,876
Women and Food Science:together towards national visibility	Prof.B.Chove	NUFU	July,2008	June, 2013	NOK 5,175,500
Safe Food Fair Food	Prof. L. Kurwijila	ILRI	June,2009	June,2011	USD 25,000
Msc Training in Plant Bleeding and Related Fields	Dr. C.L. Rweyemamu	AGRA	Jan,2009	Dec,2011	USD 393,545.8
GERAFT	Prof.R.Kazwala	Germany Research Foundation	June,2009	May,2012	Euro 403,186
Wastewater Irrigated Agriculture as a Mean to Alleviate Poverty	Dr.H.Shombe	Centre for Development and Environment, Switzerland	Jan,2009	Dec,2011	CHF 45,000
Landscape Ecological Clarification of Bubonic Plague Distribution and Outbreaks	Dr.D.Kimaro	VLIR	Oct,2008	Sept,2013	Euro 307,360.06
Bean Bruchid Resistance	Dr.P.Kusolwa	Mcknight Foundation	Sept,2009	Sept,2012	USD 432,000
Scaling Up Minjingu Phosphate Utilization in Tanzania	Prof.J Semoka	AGRA	July,2009	June,2012	USD 424,416
Enhancing Children Nutrition and Rural Livelihoods in Malawi Mozambique	Prof.Y Muzanila	Mcknight Foundation	Aug,2009	Sept,2013	USD 240,000
Food Security, Adequate Care and Environmental Quality	Prof. (Mrs) J.Kinabo	IDRC	Feb,2010	Jan,2013	CAD 600,000
Efficacy of a low dose ferric sodium ethylene ethylene tetracetic acid (FeNaEDTA)	Prof. T. Mosha	H.J. Heinz Co.	Jan.2010	Dec,2011	USD 130,117
Determine the Potential Global Distribution for Bactrocera Invades using Climex	Dr. M.Mwatawalah	CRI-STELLENBOSCH UNIVERSITY	Jan,2011	Dec,2012	USD 14,260
Development of Management Practices for Sustainable Improvement of Indigeneous Goats in Tanzania	Prof.Chenyambuga	RUFORUM	Jan,2011	Dec,2012	USD 59,750
Legume Biomass Transfer for Enhancing Productivity of maize in striga infected Farmlands.	Prof.K.Sibuga	RUFORUM	Jan,2011	Dec,2012	USD 60,000

Sustainable Nutrition Research for Africa in years to come (SUNRAY)	Prof.J.Kinabo	Institute of Tropical Medicine	Jan,2011	Dec,2013	Euro 117,710.70
Impact of climate variability on fisheries and mangrove ecosystems based mariculture along the Tanzania coast	Dr.B.Mnembuka (SUA)	CCIAM Programe	Jan,2010	Dec,2014	TZS 177,000,000

Table H.2. Current Research Projects Funded by Government of Tanzania, Faculty of Agriculture, SUA

Project	Project Leader	Source of Funds	Commencent Date	End Up Date	Total Grant Value
Genetics Diversification of Tomato for Health production	Dr. Kusolwa	Ministry of Agriculture ZARDEF	Oct. 2010	Sept. 2012	TZS 30,000,000
Analysis of Genes and Genetic makers associated with mestitis resistance in Ingegeneous Cattle in Tanzania	Prof. Chenyambuga	COSTECH	Jan,2010	Dec,2011	TZS 25,000,000
Turning Rural Scavenging Local Chicken into Profitable Business	Dr.S.Mbaga	COSTECH	Jan,2010	Dec,2012	TZS 43,750,230

Annex I: Sokoine University of Agriculture Gender Policy

Gender Policy for Gender Balanced SUA Community

Sokoine University of Agriculture

October 2010

Foreword

The formulation of the Gender Policy for Sokoine University of Agriculture (SUA) was initiated by the Women Development Support Project (WDSP) under the SUA-NORAD Frame Agreement. The initiative aimed at institutionalizing efforts to address gender issues that were evident at SUA and the country at large. Consequently, the Women Development Support Committee (WDSC), which was responsible for coordinating implementation of the WDSP, organized a Gender Policy Formulation Workshop in May 1999. The workshop drew participants from all relevant sections of the University, including academic and administrative staff as well as undergraduate and postgraduate students. The workshop report was subsequently developed into a Gender Policy in 2002 after approval by relevant SUA organs. The policy was officially inaugurated in 2003 by the then Minister of Community Development, Women and Children, Dr. Asha-Rose Migiro (Now Deputy Secretary General of the United Nations).

Since its inauguration, the policy enabled SUA make several achievements in terms of raising gender awareness, increasing enrollment of female students and increasing gender balance in employment to mention a few. However, from that time new developments and structural changes that have impact on gender have occurred within SUA, nationally and internationally. The SUA Corporate Strategic Plan (Phase II) 2005 - 2010 (SCSP) and the University Charter (2007) are among the new key developments that have emerged at SUA. Nationally, a number of development policies and strategies have been formulated. These include the National HIV/AIDS policy (2001), National Strategy for Growth and Reduction of Poverty (NSGRP/MKUKUTA) (2005), Universities Act (2005) and the National Population Policy (2006). Internationally, the Millennium Development Goals (MDGs) (2001) have come up with new targets on gender. In addition, some gaps were noted in the course of implementing the previous policy. The previous version of the policy missed harassment issues, the rationale as well as monitoring and evaluation (M&E). The policy also had incomplete definitions of key concepts and its implementation framework was inadequate. In view of this, the previous policy has been revised in order to capture the new issues at all levels and fill the identified gaps.

The revised gender policy aims at strengthening SUA's institutional capacity to effectively fulfill its vision and mission in training, research, extension, outreach, consultancy and community service with a gender perspective. The success in achieving the objectives of this policy is the responsibility of all actors of the policy, decision-making and implementation levels of our institution. It is my expectation that, with full support and participation of all actors at SUA, the implementation of this policy will be a success.

Prof. Gerald C. Monela
Vice Chancellor, Sokoine University of Agriculture
October 2010

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ABBREVIATIONS

AU	-	African Union
CEDAW	-	Convention on the Elimination of all forms of Discrimination Against Women
CoD	-	Committee of Deans and Directors
GAD	-	Gender and Development
GPIC	-	Gender Policy Implementation Committee
HIV/AIDS	-	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ILO	-	International Labour Organization
M&E	-	Monitoring and Evaluation
MCDGC	-	Ministry of Community Development, Gender and Children
MCDW&C	-	Ministry of Community Development, Women Affairs and Children
MDGs	-	Millennium Development Goals
MKUKUTA	-	Mkakati wa Kukuza Uchumi na Kupunguza Umasikini
MUCCoBS	-	Moshi University College of Cooperatives and Business Studies
NORAD	-	Norwegian Agency for Development Co-operation
NSGRP	-	National Strategy for Growth and Reduction of Poverty
RAAWU	-	Researchers, Academic and Allied Workers Union
SADC	-	Southern Africa Development Community
SCSP	-	SUA Corporate Strategic Plan
SNAL	-	Sokoine National Agricultural Library
SUA	-	Sokoine University of Agriculture
SUASA	-	Sokoine University of Agriculture Academic Staff Association
SUASO	-	Sokoine University of Agriculture Student Organization
UNDP	-	United Nations Development Programme
URT	-	United Republic of Tanzania
WDSC	-	Women Development Support Committee
WDSP	-	Women Development Support Project

CHAPTER ONE

1.0 BACKGROUND

Gender addresses socio-cultural dimensions of differences between men and women in all categories, providing a dynamic picture of society in which men and women interact in the development process. Gender categories include: children, people with special needs, elderly, vulnerable and disadvantage groups. However, due to inequality between men and women as manifested in education, labour markets, decision-making bodies, political structures and households; it has become necessary to develop conventions and other forums that address these imbalances.

At the international front, the Convention on the Elimination of all forms of Discrimination against Women (CEDAW) was ratified in 1979. CEDAW is the basis for many other efforts to foster equality between men and women by promoting and supporting gender mainstreaming. Other international efforts include:

- The Nairobi Forward Looking Strategies (1985).
- The Beijing Declaration and the Platform of Action (1995).
- Gender Development Declaration of the Southern African Development Community (1997).

Tanzania has since independence been in the forefront to promote equity and equality for its citizens, both men and women. These rights are enshrined in the constitution of 1977 as amended in 1984 and 2000, which assures equality, respect, justice and freedom for all people irrespective of sex, color or race. The Father of the Nation, *Mwalimu J. K. Nyerere* once said:

Tanzania could not talk of development and be proud of achievements attained in socio-economic field without a mention of women because they are a major force in the country's economic development effort (Nyerere, 1981).

Tanzania is a signatory of various international conventions. In view of this, the government has made many efforts, endorsed and adopted the implementation of various strategies and plans of actions related to gender. Efforts to promote gender equity and equality in Tanzania include the following:

- The Arusha Declaration (1967) emphasized the elimination of exploitation of one person by another and advocated democracy and equality between the sexes.
- The Villagization Policy (1975) attempted to give equal say and access, for men and women, to resources and decision making institutions within villages and other bodies in local communities.
- The Musoma Resolution (1975) exempted girls graduating from high school from attending two years of community service before joining the university, to give them a head start compared to their male colleagues, in order to compensate for many years of being disadvantaged.
- Universal Primary Education (1977) required parents to send all school-aged children to school.

In order to address gender issues properly, Tanzania has set a specific ministry, the Ministry of Community Development, Gender and Children (MCDGC). The ministry has mandate to take the lead to coordinate issues and programmes that involve gender. Consistent with this, the Women and Development Policy was formulated in 1992. This has since, been replaced by National Gender Policy (2000). The policy directs formation of Gender Focal Points within the government structure at all levels (central and local government and institutions). This is the basis for establishing the SUA Gender Policy.

1.1 AN OVERVIEW OF SOKOINE UNIVERSITY OF AGRICULTURE

1.1.1 Establishment of the University

Sokoine University of Agriculture was established on July 1st 1984 Parliamentary Act No.6 of the same year. The university was created from the former Faculty of Agriculture, Forestry and Veterinary Science, which was until then part of the University of Dar es Salaam.

To date the university has four campuses and one constituent college. The campuses include the Main Campus and Solomon Mahlangu Campus, both in Morogoro Region while Mazumbai and Olmotonyi are in Tanga and Arusha Regions respectively. The latter two are mainly used for practical training. The Moshi University College of Cooperatives and Business Studies (MUCCoBS) is located in Kilimanjaro Region.

The University has four faculties, two institutes, three centers, two directorates and a library. The library is also a National Agricultural Library as well as a Legal Depository²⁰.

1.1.2 Vision, Mission and Objects of the University

The Vision of the University is to become a centre of excellence and a valued member of the global academic community in agriculture²¹, natural resources, rural development and other related fields with emphasis on implementing practical skills, entrepreneurship, research and integration of basic and applied knowledge in an environmentally friendly manner.

The Mission of the University is to promote development through training, research, and provision of services to the public and private sector in an environmentally friendly manner.

The general Objects of the University shall be to advance knowledge, wisdom and understanding through teaching, research, extension and consultancy and by the example and influence of its corporate life. The University is also engaged in production of crops, livestock and livestock products.

1.1.3 Gender situational analysis

As an institution of higher learning, SUA has always endeavored to promote gender equity and equality through its various programmes. SUA has taken a number of initiatives/measures aimed at improving gender balance at the university and the country at large. These include:

- Establishment of SUA Women Development Support Project
- Gender capacity development for SUA staff
- Introduction of Pre-entry Science Programme for female students
- Sensitizing girls to join SUA degree programmes
- Sensitizing secondary school girls to opt for natural science subjects
- Sensitization workshop on gender issues to secondary school teachers
- Mainstreaming gender in training, research and outreach activities
- Gender sensitization workshops/seminars for SUA community
- Introduction of undergraduate and postgraduate full courses on gender
- Gender considerations in terms of students' welfare e.g. accommodation

While such efforts are commendable, gender balance has not been fully attained at SUA. There are several gender issues to be addressed with respect to human resource development (academic and administrative) and students' enrollment, performance as well as retention.

²⁰ A library to which there is a legal requirement for depositing a copy of every book printed in the United Republic of Tanzania.

²¹ Agriculture is defined in a broad sense to include crop and livestock production as well as fisheries, forestry, veterinary sciences, and wildlife.

(a) Academic Staff

The target set under the Beijing Platform of Action was to attain at least 30% women at various levels by the year 2005. However, the proportion of female academic staff at SUA is still very low, stands at around 21% 2009. This situation has been perpetuated by three main factors:

- Initially, recruitment of female academic staff was very slow. The first batch of female academics was recruited in 1975, but the next joined five years later. It took more than 25 years (1975 – 2001) for the proportion to double from 5% to 10%.
- The pool of qualified females in the country is small. This is due to low levels of enrollment and retention of girls at all educational levels.
- Generally, girls shy away from natural sciences at secondary and tertiary levels.

In terms of participation in the university decision-making bodies, female academic staff are underrepresented. For example by 2009, only about 19% of female academic staff were members of faculty/institutes boards/Senate/Council.

(b) Administrative Staff

To date, very few women occupy senior positions in accountancy, administration or technical fields. By 2009, SUA had a total of 824 administrative staff, of which 33% were females. However, most females are concentrated in low cadre jobs. Majority of them are either certificate holders or primary school leavers. In terms of participation in their decision-making bodies female administrative staff appears to be relatively better represented. Female formed one third of all administrative staff yet they are underrepresented in decision making bodies.

(c) Students' enrollment

The proportion of female students who are registered at institutions of higher learning in Tanzania is very low, being only 15% in 2006/07 for all institutions on average. Nevertheless, the enrollment of female students at SUA has been increasing steadily even though it is lower than that of male students. Female enrollment in undergraduate programmes increased from 24% in 1996/97 academic year to 33% in 2008/09 academic year. Female postgraduate students constituted 28.8% of all postgraduate students in 2008/09 academic year.

Although there has been a gradual increase in female students' enrollment at SUA, the overall proportion is still undesirably low. This is attributed to several factors, including:

- Majority of female students in secondary schools shy away from natural science subjects. Most courses offered at SUA are natural science-based.
 - A career in agricultural sciences and related fields is not attractive to many women.
 - The pool of females from secondary schools with relevant qualifications is very small.
 - There is inadequate number of role models in the field of agricultural sciences whose accomplishments can be admired by girls and young women, and entice them to emulate.
 - Stereotyping within some curricula as well as teaching materials at all levels in the educational systems has also been identified as a limit to the participation of women.
- Low publicity of courses offered at SUA.

CHAPTER TWO

2.0 RATIONALE

While the progress that has been made towards increasing the proportion of female and male within the staff and student body at SUA is commendable, gender issues are still prevalent as previously noted. Furthermore, gender issues are not only a concern of SUA, but also at national and international levels.

Articles 9, 21, and 22 of the United Republic of Tanzania (URT) constitution provide respectively, respect of human rights, the right to participate in governance and equal opportunities for both men and women. The constitution establishes affirmative principle as a temporary measure to rectify the historical gender imbalances. In addition to the constitution, the Tanzania's National Vision 2025 (1999) aims at attaining human development in order to reduce poverty, inequality and all forms of socio-political exclusion. Similarly, NSGRP/MKUKUTA (2005) considers gender as a crosscutting issue. This is well addressed in Cluster No II "Improving the Quality of Life and Social Well-being" of men and women in the society. The National Gender Policy (2000) calls for public institutions to rectify the historical gender imbalance as well as mainstreaming gender issues in all development plans. The Higher Education Policy (1999) underscores the need for gender equity and equality for both men and women. Furthermore, the Universities Act (2005) provides for gender equality, balance and equity as one of the functions of the universities.

Internationally, Tanzania is a signatory to various human rights instruments, which adhere to equity policies and non-discriminatory practices. Various International Labor Organization (ILO) instruments, which the country is a part to, demand protection of women against discrimination in employment. The ILO 111 Convention (1958) calls upon member states to pursue policies designed to promote equal opportunity and treatment in respect to employment and occupation in order to eliminate any kind of discrimination. The Universal Declaration of Human Rights and the Bill of Rights bind Tanzania morally to ban discrimination of all forms. The CEDAW (1979) binds the Tanzanian government legally to ban discrimination and promote as well as empower women in all spheres. The Beijing Platform of Action (1995) identified 12 critical areas of concern of which Tanzania prioritized four main areas as a commitment. These include enhancement of women's legal capacity, economic empowerment of women, political empowerment of women and improvement of women's access to education and training. Goal No. 3 Target 4 of the MDGs (2001) calls for elimination of gender disparity in all levels of education no later than 2015. Furthermore, regional instruments such as Gender Development Declarations of SADC (1997) bind Tanzania to have an affirmative action to promote females' participation in politics. The Declaration set a 33% benchmark as a minimum percentage for females' participation in decision-making process while, the AU set a benchmark of 50%.

Therefore, SUA has the role and mandate to establish and implement a gender policy that would be consonant with the international, regional and national instruments. Such a policy would promote gender equity, equality and empowerment within the University in particular and Tanzanian society in general. The SUA Gender Policy will therefore, serve as a guide to the University on all matters pertaining to gender and form the basis for the strategies to achieve gender balance.

CHAPTER THREE

3.0 VISION, MISSION, GOAL AND OBJECTIVES

3.1 VISION

The Vision of the Gender Policy is to enable SUA become a gender balanced community with equal opportunity to all people based on their ability and merit, so that the University utilizes its human resources potentials optimally and in harmony.

3.2 MISSION

The Mission of the Gender Policy is to promote and achieve gender balance in training, research, extension/outreach, consultancy and other related services.

3.3 GOAL

The goal of the Gender Policy is to strengthen SUA's institutional capacity to effectively undertake its role in training, research, extension, outreach, consultancy and community service with a gender perspective.

3.4 OBJECTIVES

In order to achieve the goal, which embodies the vision and mission of the policy, SUA will pursue the following objectives.

3.4.1 Training

- a) To increase the enrollment of female students in all training programmes.
- b) To develop the capacity of female academic and administrative staff.
- c) To mainstream gender into SUA's curricula.
- d) To expand networking with gender-related professional groups.

3.4.2 Research and Extension/Outreach

- a. To mainstream gender in research, extension and outreach activities.
- b. To establish easily retrievable gender disaggregated data.
- c. To design and disseminate gender sensitive technologies and extension materials.
- d. To design and conduct gender sensitive outreach programmes.

3.4.3 Consultancy

- a) To mainstream gender in consultancy activities.
- b) To transform values and attitudes that hinder gender equity and equality.

3.4.4 Institutional Development and Supporting Infrastructure

- a) To mainstream gender in planning and infrastructure development.
- b) To increase the representation of females in decision-making bodies.
- c) To mobilize resources for gender equity and equality.
- d) To promote gender equity, equality and empowerment at all levels.
- e) To prevent all forms of harassment at all levels.
- f) To institutionalize M & E system across the entire policy

CHAPTER FOUR

POLICY STATEMENTS AND STRATEGIES

This chapter provides policy statements and strategies earmarked for effective implementation of policy objectives.

4.1 TRAINING

4.1.1 Policy Statements

SUA shall endeavour to:

- i. Increase the enrollment of female students in all training programmes.
- ii. Develop the capacity of female academic and administrative staff.
- iii. Mainstream gender into SUA's curricula.
- iv. Promote networking to gender-related professional groups among staff and students.

4.1.2 Strategies

- a) Encourage female students in secondary schools to go for natural science subjects.
- b) Promote and enhance the enrollment of female students at SUA.
- c) Promote capacity development for female academic and administrative staff.
- d) Promote gender mainstreaming into SUA curricula.
- e) Encourage staff and students to network to gender-related professional groups.

- f) Establish training programmes on gender issues

4.2 RESEARCH AND EXTENSION/OUTREACH

4.2.1 Policy Statements

SUA shall endeavour to:

- i. Mainstream gender in research, extension and outreach activities
- ii. Establish easily retrievable gender disaggregated data.
- iii. Design and disseminate gender sensitive technologies and extension materials.
- iv. Design and conduct gender sensitive outreach programmes.

4.2.2 Strategies

- a) Promote gender mainstreaming in research, extension and outreach activities
- b) Encourage men and women to participate in multidisciplinary research and extension.
- c) Promote generation and dissemination of user-friendly gender disaggregated data.
- d) Promote gender sensitive outreach programmes.

4.3 CONSULTANCY

4.3.1 Policy Statements

SUA shall endeavour to:

- i. Mainstream gender in consultancy and outreach activities.
- ii. Transform values and attitudes that hinder gender equity and equality.

4.3.2 Strategies

- a) Promote gender mainstreaming in consultancy
- b) Promote change in values and attitudes that hinder gender equity and equality.

4.4 INSTITUTIONAL DEVELOPMENT AND SUPPORTING INFRASTRUCTURE

4.4.1 Policy Statements

SUA shall endeavour to:

- i. Mainstream gender in planning and infrastructure development.
- ii. Mobilize resources for gender equity and equality.
- iii. Promote gender equity, equality and empowerment at all levels.
- iv. Discourage all forms of harassment at all levels.
- v. Increase the representation of women in decision-making bodies.
- vi. Institutionalize M & E system across the entire policy

4.4.2 Strategies

- a) Encourage mainstreaming of gender issues in planning and infrastructure development
- b) Promote recruitment and retention of female staff at SUA.
- c) Encourage re-design and use of gender sensitive infrastructure.
- d) Formulate mechanisms that discourage all forms of harassment.
- e) Encourage mobilization of resources to address gender equity and equality
- f) Create awareness and develop capacity for gender equity, equality and empowerment.
- g) Increase participation of women in decision-making.
- h) Institutionalize M & E system across the entire policy

CHAPTER FIVE

5.0 IMPLEMENTATION FRAMEWORK

5.1 ORGANIZATION AND MANDATE

The implementation of this Gender Policy shall be institutionalized within the organization structure of SUA. The policy shall be coordinated by the Gender Policy Implementation Committee (GPIC). The GPIC shall be headed by the Vice Chancellor (Chairperson) who shall be assisted by a coordinator appointed by the Chairperson amongst members representing Faculties, Institutes, Centres, Directorates, SNAL and SUASO. The Committee shall report to the University Finance, Planning and Development Committee (FPDC) through the Committee of Deans and Directors (CoD) for onward transmission to the University Council.

5.1.1 The Role of the University Council

- a) To advice on short, medium and long term implementation programmes.
- b) To advice on Gender Policy revision.
- c) To ensure gender balance in decision making bodies.

5.1.2 Finance, Planning and Development Committee

- a) To allocate financial resources for the implementation of the Gender Policy
- b) To approve work plans and budgets of the GPIC
- c) To receive and approve financial progress reports

5.1.3 Committee of Deans and Directors

- a. To approve the Gender Policy
- b. To approve GPIC activities
- c. To advice on GPIC work plans
- d. To ensure implementation of the Gender Policy through the existing university machinery.

5.1.4 The Role of GPIC

The GPIC will have the following mandate:

- a) To take a lead in coordination and implementation of the Gender Policy.
- b) To coordinate, monitor and evaluate all gender related activities within the University.
- c) To advise and assist relevant institutions within SUA on gender related issues.
- d) To take an active role in addressing gender issues affecting the SUA community.
- e) To review the Gender Policy from time to time when necessary.
- f) To translate the Gender Policy into implement able programmes.
- g) To establish networks with other institutions working in gender related issues.
- h) To mobilize resources for the implementation of the Gender Policy.
- i) To establish and maintain a Gender Resource Centre at SUA.
- j) To plan and prepare gender related activities for community sensitization.

5.1.4 The Roles of Other Actors

Success of this Gender Policy depends on resolute commitment of every member of the University. However, there are some key players whose support is critical to facilitate the process of gender mainstreaming into all aspects of the University. These include the:

- i. Workers Council
- ii. SENATE
- iii. Appointment and Human Resources Committee (Academic)
- iv. Appointment and Human Resources Committee (Administration)
- v. Faculty Deans and Institute/Centre Directors
- vi. Heads of Departments

- vii. Coordinating Committee of the CSP
- viii. Sokoine University Academic Staff Association (SUASA)
- ix. Sokoine University Students Association (SUASO)
- x. Researchers, Academic Allied Workers Union (RAAWU)

5.1.1.1 Workers Council

- a) To advise the University Council on Gender Policy implementation.
- b) To advise the University Council on short, medium and long term gender implementation programmes.
- c) To recommend to the University Council on Gender Policy revision.

5.1.1.2 The Role of the University SENATE

- a) To ensure that gender issues are mainstreamed at all levels within the University's academic programmes.
- b) To ensure that the Policy continues to be articulate and dynamic.
- c) To approve mechanisms that prevents all forms of harassment.

5.1.1.3 Appointments and Human Resources Committees (Academic and Administration)

- a) To ensure gender balance in recruitment, retention, training and promotion.
- b) To promote employment opportunities for females through affirmative actions.
- c) To ensure gender balance in remuneration and fringe benefits.
- d) To promote the welfare of staff with special needs.
- e) To prevent all forms of harassment at all levels.

5.1.1.4 Faculty Deans and Institute/Centre Directors and Heads of Departments

- a) To ensure gender mainstreaming into SUA curricula
- b) To ensure gender balance in staff recruitment, retention, training and promotion.
- c) To ensure gender balance in students' enrollment through affirmative action for females and students with special needs.
- d) To prevent all forms of harassment at all levels.

5.1.1.5 Coordinating Committee of the CSP

- a) To mainstream gender into training, research, extension and outreach programmes
- b) To increase admission rate of females and students with special needs
- c) To ensure gender equity and equality in employment and decision making positions.
- d) To plan for resources to support Gender Policy implementation.
- e) To formulate mechanisms for changing values and attitudes that hinder gender equity and equality.
- f) To design and ensure construction of gender sensitive infrastructure.

5.1.1.6 Staff and Students Associations

Staff and students' association include RAAWU, SUASA and SUASO. The roles of these associations are:

- a) To ensure commitment and support implementation of the Gender Policy.
- b) To advocate and sensitize the public on gender issues.
- c) To discourage all forms of harassment at all levels.
- d) To participate in changing values and attitudes that hinder gender equity and equality.
- e) To ensure gender balance in their associations.

CHAPTER SIX

6.0 COORDINATION, MONITORING AND EVALUATION

6.1 COORDINATION

The implementation of this Gender Policy and the attainment of the vision, mission, goal, objectives and strategies stipulated in it will depend greatly on a well-defined and effective coordination mechanism. At the institutional level, the CoD and FPDC will be responsible for overseeing the efficient implementation of the policy. The GPIC, which is the coordinating body, will play a major role in implementation of the Policy and the coordination of gender issues at SUA. To ensure effective coordination of policy activities, the GPIC will be required to provide quarterly implementation reports of their activities to FPDC through .CoD.

6.2 MONITORING AND EVALUATION (M & E)

Successful implementation of the Policy will largely depend upon effective Monitoring and Evaluation (M&E) mechanism. These tools are necessary means for assessing the implementation of strategies and achievements of policy goals and objectives. The University through GPIC will support M & E exercises. The GPIC will work together with other actors in the M & E of policy activities in their respective areas. In consultation with the implementing actors, GPIC will develop guidelines and indicators to be used for M & E of the policy and related programmes. In addition, all actors involved in the implementation of the policy will be responsible for M&E of policy activities falling within their jurisdiction.

The M & E mechanisms will focus on the analysis of the policy progress in the attainment of qualitative and quantitative objectives. M & E reports will be produced and disseminated in order to allow stakeholders at all levels to share views on the progress of the policy. In addition, M & E results will be used to review strategies and programmes and where necessary to make adjustments for the purpose of improving performance and achieving the intended results.

APPENDIX

DEFINITIONS OF GENDER KEY CONCEPTS

Access: Opportunity to get hold of or utilize resources and services such as land, cash, capital, technology, training, health care, etc., more often women have use but do not own and/or control such resources and services.

Affirmative action: Actions that are engaged to give preference in order to enable disadvantaged groups get better access to recruitment, promotions, contracts or employment positions. It is a positive discrimination, a deliberate action to redress past and present inequalities on the basis of sex and disability in order to provide equal opportunities to everybody.

Capacity development: The process by which individuals, organizations, institutions and societies develop their abilities individually and collectively to perform functions, solve problems and set and achieve objectives.

Disaggregated data: Data that are presented in terms of gender, sex, age, or other variables that emphasize the differences on needs, activities, priorities and interests of the community.

Discrimination: Differential treatment of individuals based on such factors as age, sex, religion, ethnicity, or other individual distinctions.

Empowerment: A process of gaining power and control over decisions and resources that determines the quality of one's life. It is based on developing an awareness of the causes of inequality and comprises actions that may help overcome obstacles to equality.

Gender: Gender refers to the comparative or differential roles, responsibilities and opportunities for men and women in all social groups in a given society. Social groups (gender categories) include youth, elderly, people living with disabilities/special needs, children and other disadvantaged groups.

Gender mainstreaming: Is a means, process, or strategy for achieving gender equity or equality. It is the incorporation of gender perspectives/dimension into all activities, processes, policies, and laws, regulations etc. In this way gender becomes an integral partaker of action than add-on.

Gender sensitive indicator: Gender sensitive indicator, is a signal that help to measure gender related change disaggregated differently between female and male.

Gender relations: Socially determined relations between men and women within and outside their households and communities, these relations are socially constructed and are dynamic over time and space.

Gender analysis: Gender analysis is the practice of examining special process, which determines the division of labour and roles between men and women, as well as their differentiated access to or control of factors of production, services and resources.

Gender awareness: The knowledge and appreciation of social and cultural differences between men and women and that men and women's needs, expectations and their overall situation of inequality is determined by their gender relations and is changeable.

Gender needs: These are the individual requirements or priorities of men and women basing on their differentiated roles, access to or control over factors of production and services.

Gender gap: Differences (whether qualitatively or quantitative) of treatment between men and women, boys and girls in regards to accessing resources, services, opportunities, needs and other individual requirements.

Gender role: Socially determined tasks, activities, responsibilities for men and women that are based on socialization and socially perceived expectations on how men and women should act or perform.

Gender budgets: 'Gender-sensitive budgets,' or 'women's budgets,' refers to a variety of processes and tools, which attempt to assess the impact of budgets, on different groups of men and women, through recognizing the ways in which gender relations underpin society and the economy. Gender or women's budget initiatives are not separate budgets for women. They include analysis of gender-targeted allocations (e.g. special programmes targeting women or men); they are disaggregated by gender. They also include, impact of mainstreaming expenditures across all sectors and services; and they review equal opportunities policies and allocations within government service.

Gender equity: Refers to fairness and justice in women's and men's access to socio-economic resources, benefits and responsibilities in all spheres of life. Achieving equity could be one way of achieving equality.

Gender equality: It is an equal sharing of power between female and male members of a community/society in regard to their access to factors of production, access to services and or control over the same. It refers to norms, values, attitudes and perceptions required in attaining equal status between men and women without neutralizing the biological differences between men and women.

Gender balance: The goal of acquiring equal number or proportions of female or male staff, students or other actors in a place of work, learning or other social engagement. It is a participation of an equal number of men and women within an activity or an organization.

Gender based violence: All forms of violence that happen to women, girls, men and boys because of unequal power relations between them and the perpetrators of such violence.

Gender bias: It is the actions that have effect on men and women by basing on perceptions on their sexes, through which favour is made and not on their position of equality within the community/society.

Gender blind: This is a conscious way of doing or saying things without recognizing or considering differences in position, needs and feelings based on gender.

Gender neutral: Interventions targeted at the actors – be they women or men, who are appropriate to the realization of predetermined – goals, which leave the existing division of resources and responsibilities intact.

Gender and Development (GAD): Looks at the larger inequities of unequal relations between the rich and the poor, the advantage and the disadvantaged and within that, the additional inequalities.

Gender sensitivity: Gender sensitivity is a situation of being knowledgeable that sex based discrimination is determined by social cultural factors such as attitudes and behaviors that limit or promote boys and girls towards various tasks. It is also recognition of the differences and inequities between women's and men's needs roles, responsibilities and identities.

Gender perspective: A view or focus on how men and women affect or they are affected by the intended/or implemented activities, policies, projects or interventions.

Gender policy: A framework which lays out what needs to be done in order to address gender imbalances in a given setting. It entails broad guidelines providing a framework for ensuring gender equality.

Gender stereotyping: It is the act of assigning roles, tasks and responsibilities to a particular sex on the bias of preconceived prejudices.

Harassment: Refers to unwelcome advances, requests for favours, or other conduct by way of words, acts, or comments that would embarrass, humiliate, intimidate, demean or compromise a reasonable person at whom such advances requests or conduct were directed.

Monitoring: Term used to mean an investigation intended to track of/or gathering information on government practice, project/programme, or any routine activities in implementation related to a particular action undertaken.

Practical Gender Needs: Those needs which are related to satisfying both men's and women's, girls and boys basic material needs for their day to day survival such as food, water, clothing and shelter. They arise out of gender division of labor as well as differences in access to and control over resources and benefits.

Sex roles: The concept used to explain, the biologically determined reproductive roles such as child bearing and women, fertilization of men and breast-feeding.

Sex: It is a genetically determined by characteristics of being either female or male. Sex is the biological differences between men and women, which are universal, obvious and generally permanent. Sex describes the biological, physical and generic composition with which we are born.

Sexual harassment: The imposition of sexual advances in the context of a relationship of unequal power.

Strategic Gender Needs: Needs that are related to changing the situation of marginalized people, especially women and girls to reach social equality. These arise out of the analysis of women's position relative to that of men.

Annex J: Gender Issues and Recommendations: Ministry of Agriculture, Food Security and Cooperatives

The assessment team reviewed gender issues in the Ministry of Agriculture, Food Security and Cooperatives as related to capacity building, research and opportunities for increased collaboration with SUA and external stakeholders. An interview was also conducted at the Ministry of Community Development, Gender and Children to gain more insight into country-wide issues related to gender. Due to a shortage of time, and intermittent power outages, not as many interviews were conducted as desired. However, the information presented is an overview of issues and suggested recommendations.

- a. Capacity Building.** Initial interviews with Ministry staff indicated needs in technical areas such as management, creating standards for agro-mechanization, agro-processing, food processing, better record keeping and livestock sciences. Each of these areas would benefit from integrating gender sensitization into the training curricula to more definitively address the needs of both men and women. There were also requests for increased training in gender sensitization, particularly as it relates to clerical/administrative staff. Their importance in record keeping and flow of documents is not recognized. Increased training in ICT and access to better quality computers was also mentioned.
- b. Communications.** It was noted there is a need for better and more consistent communications among the various units of the Ministry and between ministries as staff are frequently not apprised of current or proposed activities.
- c. Human Resources and Staffing.** All ministries follow a “Code of Ethics and Conduct for Public Service” created in 2005. All new employees receive this and an orientation when they begin. However, any specific training depends on funds being available. Upon review of this document, there is a segment dedicated to sexual harassment, but no gender inclusive language. The Ministry has a grievance process, but frequently women will not use it as they are concerned about any negative consequences. Of the 315 DRDS staff at research stations, 95 or approximately 30% are female. There is a need to increase this number to meet parity of 50% female staff.
- d. Education.** Concerns about the lack of quality of secondary school education for young women, particularly in math and science, were expressed a number of times. There was also a comment that a proposed change regarding the allocation of student funding is currently in Parliament. This change would allocate funds directly to the universities instead of the student, which may have negative impacts on students from rural areas (particularly girls) who are already experiencing hardship paying university fees.
- e. Cultural Constraints.** The Marriage Act was passed in 1971 and prohibited girls from being married younger than 14. Recently the Child Act was passed (2009) that defined a child as between 0-18 years old. The Ministry of Community Development, Gender and Children is working to align these two bills, to create greater protection for young women. However, various tribes and religious groups continue to marry daughters at very young ages which is

detrimental to their health and chances of higher education. There is little enforcement of the bills, particularly in rural areas.

- f. Research.** A review of publications between 2000- 2011 indicated there were 173 published papers, none of which had an explicit gender focus (Annex F, Table F.3). Of the 253 research projects, none had an explicit gender focus (Annex F, Tables F.1 and F.2). Another concern is the target audiences for the research are “small and large scale farmers, NARS and extensionists,” yet no mention is made of targeting women farmers.

Recommendations to Address Key Issues:

Human Resources

- Create professional development opportunities that enhance women’s abilities to receive promotion
- Review and revise the “Code of Ethics” for gender inclusive language, and not only Sexual Harassment. Include a specific statement on creating and monitoring a gender equitable workplace, i.e., “Both men and women will receive equal opportunities for professional development and promotion as appropriate that will be monitored by the Gender Focal Points.”
- Provide orientation and written documents to both staff and clerical/administrative staff
- Provide regular gender sensitization training for all levels of staff

Education

- Support program to visit secondary schools to sensitize teachers, parents and young girls about the importance of science and math education
- Review implications of lack of university funding for female students, particularly girls from rural areas

Cultural Constraints

- Provide support for the Child Act to prevent marriages of underage girls
- Work closely with the Ministry of Community Development, Gender and Children to strengthen linkages and support legislation that improves the well-being of women and children

Research

- Develop gender collaborative working group with members from NARS, SUA, NGO’s (including the Tanzania Gender Networking Program), USAID WID/GEWE and private sector to identify areas of need, funding and research opportunities
- Research the implications of lack of government funding on girls’ application rates and success in higher education institutions
- Include a gender focus and training for researchers on gendered approaches to research design, data collection and analysis

Annex K: Computing Use Policy

Michigan State University Acceptable Use of Computing Systems, Software, and the University Digital Network

I. Foreword

Access to modern information technology is essential to the pursuit and achievement of excellence across the MSU mission of instruction, research, and service outreach. The privilege of use of computing systems and software, as well as internal and external data networks, is important to all members of the University community. The preservation of that privilege for the full community requires that each individual faculty member, staff member, and student comply with institutional and external standards for appropriate use.

To assist and ensure such compliance, Computing and Technology, with the advice and counsel of the all-University Communities for Advising, Facilitating and Enabling (CAFE)¹, establishes the following administrative ruling, applicable to all faculty, staff and students.

II. Definitions

A "System Sponsor" is the individual under whose authority a computing system, local network, or external network connection is funded. Individual computer systems and local networks may be sponsored by faculty members (e.g., using research grant funds), or by departments, colleges, or other units, in which latter case the unit administrator is the System Sponsor. For the purposes of this ruling, the Director of Academic Technology Services (ATS) is the System Sponsor for the inter-building MSU digital network and for MSU external network connections, including those to BITNET, CINET, and MERIT and other parts of the national Internet.

A "System Manager" is the person who is authorized by a System Sponsor to grant and create user privileges, maintain the system filestore, and generally ensure the effective operation of a system. (For example, in the case of UNIX systems, the System Manager typically will be the "superuser" who uses the "root" user ID.) In some cases, the System Manager and the System Sponsor may be the same individual.

"Facility Staff" are the individuals who are authorized to monitor, manage, or otherwise grant temporary access to computing facilities (such as computer laboratories) in which one or more systems are used on an open access basis by either specific populations of faculty, staff, and students, or the entire campus community.

A "User" is any individual who uses, logs in, attempts to use, or attempts to log in to a system, whether by direct connection or across one or more networks, or who attempts to connect to or traverse a network, whether via hardware, software, or both. The term "User" thus includes System Sponsors, System Managers, and Facility Staff.

III. Implications of Diversity in the Information Technology Environment

1. The provision and use of computing and networking privileges is governed by Michigan State University's Anti-Discrimination Policy. System Sponsors are responsible for ensuring full compliance.

- **1.1** Access to computing or networking hardware or software is not to be restricted based upon ethnic or national origin. Restrictions predicated on citizenship are in general to be avoided, and must in every case receive prior approval from the Vice Provost for Libraries, Computing and Technology, who will consult with the Office of the University General Counsel in each instance.

2. Because computing systems at MSU serve diverse purposes and diverse constituencies, System Sponsors are accorded wide discretion in establishing reasonable and appropriate policies applicable to their systems. (For example, some System Sponsors, to achieve their particular goals, may permit or encourage the playing of computer games. On other systems, System Sponsors may legitimately prohibit game-playing in order to conserve scarce

resources.) The effectiveness of such policies depends substantially on their systematic communication to Users, typically at the time usage authorization is first granted by the System Manager or by Facility Staff.

3. Users must expect considerable variation in what constitutes acceptable use from system to system, and must make reasonable efforts to inform themselves about the particular policies applicable to each system they use. In cases of doubt, the burden of responsibility is on the User to inquire concerning the permissibility of an action or use, prior to execution. Questions should be directed in turn to Facility Staff, the System Manager, and the System Sponsor.

4. Even within a single system, it is sometimes appropriate for System Sponsors and/or System Managers to establish different categories of user accounts or ID's, sometimes with different attendant charges or privileges, and to authorize a single user to access accounts or ID's in two or more categories. In such cases, Users must restrict their usage of each account or ID to that appropriate for it. Similar considerations apply when accounts or ID's are held on multiple systems. (Example: a student may have a limited resource account for classwork and an unlimited resource account for research. Unauthorized use of the unlimited resource account to create a competitive advantage in the classwork is inappropriate and may be construed as academic dishonesty.)

5. Michigan State University utilizes a wide variety of software, with an equally wide range of license and copyright provisions. Users are responsible for informing themselves of, and complying scrupulously with, the license and copyright provisions of the software that they use.

- **5.1** No software copy is to be made by any User without a prior, good faith determination that such copying is in fact permissible. All Users must respect the legal protection provided by copyright and license to programs and data.
- **5.2** The licenses of certain advanced software tools (e.g., some expert system generators) require that intellectual products produced with such tools be provided to the licensor. System Sponsors are responsible for ensuring that such requirements are publicized to Users appropriately by System Managers and Facility Staff. System Sponsors and Users are jointly responsible for ensuring compliance with such requirements.

IV. Good Citizenship In "Cyberspace"

1. All Users must respect the privacy and usage privileges of others, both on the MSU campus and at all sites reachable by MSU's external network connections.

- **1.1** Users shall not intentionally seek information on, obtain copies of, or modify files, other data, or passwords belonging to other Users, whether on the MSU campus or elsewhere, or develop or retain programs for that purpose, without the authorization of the file owner or the Vice Provost for Libraries, Computing and Technology. Reasonable file copying (e.g., in back-ups) and password changes are permitted among the routine tasks of System Managers and of appropriately authorized Facility Staff.
- **1.2** Users shall not represent themselves electronically as others, either on the MSU campus or elsewhere, unless explicitly authorized to do so by those other Users. To be valid, such authorization of one User by another User must not circumvent established, system-specific policies defining eligibility for resource access.
- **1.3** Users shall not intentionally develop or retain programs that harass other Users, either on the MSU campus or elsewhere.
- **1.4** Users shall not obstruct or disrupt the use of any computing system or network by another person or entity, either on the MSU campus or elsewhere, whose usage is protected by law, ordinance, regulation, policy, or administrative ruling.

2. All Users must respect the integrity of computing systems and networks, both on the MSU campus and at all sites reachable by MSU's external network connections.

- **2.1** Users shall not by any means attempt to infiltrate (e.g., gain access without proper authorization) a computing system or network, either on the MSU campus or elsewhere.

- **2.2** Users shall not attempt to damage, or alter without proper authorization from the System Sponsor, either the hardware or the software components of a computing system or network, either on the MSU campus or elsewhere.

3. All Users of MSU's external network connections shall comply with the evolving "Acceptable Use" policies established by the external networks' governing bodies.

- **3.1** The current MERIT Michnet policy is found at <http://merit.edu/mn/about/policies-acceptableuse.html>. Or please call Libraries, Computing and Technology at 353-0722.
- **3.2** Academic Technology Services will publish revisions of external networks' "Acceptable Use" policies, making them available to Users in both printed and electronic form.
- **3.3** In cases of doubt, Users bear the burden of responsibility to inquire concerning the permissibility of external network uses, prior to execution. Such questions should be directed to the Academic Technology Services main office.

4. Computing and networking resources are sometimes in scarce supply. Resource contention may variously involve disk space, CPU time, terminal or workstation keyboard access, printer access, plotter access, software access and network bandwidth. Priorities between uses (e.g., instruction versus research versus system maintenance) and between Users (e.g., students in different classes) will vary from system to system and according to time of day, week, semester, and year.

- **4.1** System Sponsors, and by their delegation System Managers and Facility Staff, have broad discretion to set and revise reasonable usage priorities and operational policies (such as hours of operation, usage time limits, populations to be served, etc.) They may also take such routine steps (e.g., removing hung jobs, updating system configurations and user defaults, reprioritizing resource-intensive jobs, managing print queues, backing up systems, etc.) as may be reasonably necessary for the operation of their systems or facilities.
- **4.2** Users are expected to comply fully with the instructions of Facility Staff, System Managers, and System Sponsors. In particular, Users will vacate terminals, workstations, or the facility and will surrender other resources (such as printers and software) promptly when asked to do so, both at closing times and when necessary to permit access by others.
- **4.3** Where possible, Users should be provided systematic means (e.g., through facility, departmental, or college computing advisory committees, or via CAFEs at the All-University level) to advance suggestions and criticisms concerning the priorities and their implementation. Appropriate avenues for complaints concerning services provided by Facility Staff also should be provided.

V. Enforcement and Adjudication

1. The principal responsibility for investigation of suspected non-compliance with the provisions of this ruling rests with System Sponsors. At their discretion, they may delegate it to System Managers and/or Facility Staff.

- **1.1** The investigation of alleged or suspected non-compliance with this ruling is to be conducted with due regard for the rights of all Users, such as the rights to privacy and intellectual property.
- **1.2** System Sponsors may suspend service to Users without notice when reasonably necessary to the operation or integrity of the system or the networks connected to it; they may also delegate this judgment and authority to System Managers.
- **1.3** Cessation of service, whether by network disconnection or disablement of log-in capability, shall be utilized in preference to file inspection when remedying or investigating instances of alleged disruption.
- **1.4** The content of User files is not to be surreptitiously or otherwise examined, nor is the User-generated message content of User network transactions to be monitored, without the prior written permission of either the User involved or the Vice Provost for Libraries, Computing and Technology. However, System Managers and others charged by them with forwarding misdirected or undeliverable electronic mail and/or delivering print-outs and plots may examine such mail or hard-copy to the extent reasonably necessary for such purpose.

2. Subject to the non-discrimination provisions herein, faculty members acting as System Sponsors for computing systems or local networks established with their own research grant funds may change, suspend, or revoke User privileges in the best interests of the research being conducted.

3. When an instance of non-compliance is suspected or discovered in a computing system or network established by a department, college or other administrative unit, a unit administrator (typically the System Sponsor) shall proceed in accord with Section 5.6.3 of Academic Freedom for Students at Michigan State University.

- **3.1** System Sponsors may elect to refer the issue to the Vice Provost for Libraries, Computing and Technology for handling. They must always do so if systems or networks in multiple campus units have been disrupted or compromised, or if any non-MSU system, network, or party is involved.
- **3.2** Internal disciplinary action may be appropriate in some cases of non-compliance with this ruling. Relevant General Student Regulations include 1.05, 1.06, 2.02, 2.04, 4.03, 4.05, 4.06, and 5.02; allegations are adjudicable under Article IV of Academic Freedom for Students at Michigan State University. Disciplinary issues concerning students, faculty, or staff should be discussed with the Vice Provost for Libraries, Computing and Technology before action is taken, in the interests of consistency of treatment.
- **3.3** Criminal or civil action against faculty, staff, or students may be appropriate in some instances. Such cases should be discussed with the Vice Provost for Libraries, Computing and Technology, in the interests of consistency of treatment.

Annex L: Technical Annex for Section 3: Analysis of Food System Dynamics

1. Objectives

This technical annex describes the methods used in preparing the time series projections of food system dynamics.

2. Rural and urban population projections

These data (Figure 2) come from the United Nations Urbanization Project, carried out by the UN's Population Division. Complete details on the data and methods are available at:

<http://esa.un.org/wup2009/unup>.

3. Consumption Expenditure

Tanzanian consumer expenditures on foods are computed from the 2008 household budget survey. Baseline per capita consumption is summarized in Annex Table L.1.

From these data, we have computed expenditure elasticities using two different methods. First, we have computed simple arc elasticities between the fourth and second per capita expenditure quintiles for both rural and urban areas. These estimates are displayed in the first two columns of Annex Table L.2.

Second, we have estimated rural and urban expenditure elasticities econometrically using the method described by Hazell and Roell (1983). The regression used in the calculations is a modified Working-Leser model.

$$S_i = \beta_i + \alpha_i/E + \gamma_i \log E + \sum_j (\mu_{ij} Z_j/E + \delta_{ij} Z_j)$$

Letting $S_i = E_i/E$ which is the household expenditure on item i divided by the total household expenditure. The Z_j variables are household-specific variables, such as female headed household, family size, and if the household head is working. This regression was completed on each processing and commodity group separately, via OLS regression. The generated coefficients (β_i , α_i , γ_i , μ_{ij} , δ_{ij}) were then used along with the weighted means of total expenditure, log of total expenditure, and the various Z and Z/E variables to calculate the marginal budget shares (MBS _{i}) and the average budget shares (ABS _{i}) for each grouping of processing and commodity groups. Finally the MBS _{i} is divided by the ABS _{i} to calculate the elasticity.

$$MBS_i = \beta_i + \gamma_i(1 + \log E) + \sum_j \delta_{ij} Z_j$$

$$ABS_i = \beta_i + \alpha_i/E + \gamma_i \log E + \sum_j (\mu_{ij} Z_j/E + \delta_{ij} Z_j)$$

$$\varepsilon_i = MBS_i/ABS_i.$$

The resulting elasticities are reported in columns 3 and 4 of Annex Table L.2.

4. Sensitivity Analysis

Given many uncertainties about future growth rates, of population and income, and possible changes in tastes over time, the annex also explores the sensitivity of outcomes to these various sets of parameters. This sensitivity analysis suggests that projected growth in food consumption remains most sensitive to expected trends in per capita income. For that reason, Annex Table L.4 reports the results of sensitivity analysis using a range of per capita income growth rates.

In general, the commodity rankings remain the same. The major difference across scenarios lies in the maize market share of total food market growth. Given maize's large initial budget share and its low expenditure elasticity, the relative importance of maize over time increases in a sluggish income growth environment. Conversely, the importance of maize in food market growth decreases under conditions of rapidly growing per capita income.

References

Hazell, P.B.R. and A. Roell, Rural Growth Linkages - Household. Expenditure Patterns in Malaysia and Nigeria, Research Report 41, Washington, DC: International Food. Research Institute, 1983.

Table L.1. Parameters Used in Baseline Projections

	Per capita consumption (\$/day)			Expenditure Elasticities	
	2008				
	rural	urban	national	rural	urban
Food products					
Maize & maize products	\$0.39	\$0.29	\$0.36	0.3	0.0
Prepared foods consumed away from home	\$0.14	\$0.90	\$0.34	1.5	1.7
Rice (Milled Equivalent)	\$0.17	\$0.33	\$0.21	1.6	0.4
Staple vegetables (tomato, onion, green leafy, cabbage)	\$0.12	\$0.23	\$0.15	0.6	0.6
Pulses	\$0.16	\$0.12	\$0.15	0.7	0.4
Fish, seafish	\$0.11	\$0.17	\$0.12	1.2	0.6
Beef, fresh and frozen	\$0.07	\$0.21	\$0.11	1.7	1.3
Sugar and sweets	\$0.08	\$0.15	\$0.10	1.3	0.4
Non-alcoholic beverage (tea, coffee, cocoa, juices, soft drinks)	\$0.04	\$0.25	\$0.10	2.3	2.2
Plantains	\$0.11	\$0.06	\$0.09	2.5	0.3
Wheat products	\$0.06	\$0.16	\$0.09	2.6	0.5
Yams, potatoes, other roots and tubers	\$0.08	\$0.08	\$0.08	0.9	0.4
Alcoholic beverages (beer, wine, spirits, fermented)	\$0.06	\$0.11	\$0.08	1.6	3.7
Poultry, fresh and frozen	\$0.07	\$0.07	\$0.07	1.6	1.6
Cassava	\$0.08	\$0.04	\$0.07	0.1	-0.1
Oilcrops and vegetable oils	\$0.05	\$0.12	\$0.07	1.1	0.5
Milk & animal fats	\$0.07	\$0.08	\$0.07	1.3	1.0
Other foods (spices, tree nuts, etc.)	\$0.06	\$0.10	\$0.07	1.0	0.1
Tropical fruits	\$0.06	\$0.09	\$0.07	1.3	0.8
Meat, other than poultry and beef	\$0.06	\$0.04	\$0.05	2.7	1.7
Sorghum plus millet & other cereals	\$0.04	\$0.03	\$0.04	0.7	0.4
Eggs	\$0.01	\$0.04	\$0.02	0.9	2.2
Other vegetables (okra, green beans)	\$0.01	\$0.00	\$0.01	0.2	-0.3
Total	\$0.59	\$2.72	\$1.16	1.0	0.8
Population					
	Millions				
2008	31.7	9.9	41.5		
2010	32.1	11.5	43.5		
2050	39.1	45.9	85.1		
Rate of growth in total expenditure per capita					
base rate	1.8%	2.2%			
low	0.5%	1.0%			
zero	0.0%	0.0%			

Sources: LCMS 2008, UN Urban Projections

Table L.2. Alternate Estimates of Cross-Section Expenditure Elasticities

	Arc Elasticities Quintile 2 to Quintile 4		Econometric Estimates		Best estimate	
	rural	urban	rural	urban	rural	urban
Food products						
Maize & maize products	0.3	0.0	0.6	0.4	0.3	0.0
Prepared foods consumed away from home	2.3	4.0	1.5	1.7	1.5	1.7
Rice (Milled Equivalent)	1.6	0.4	1.4	0.7	1.6	0.4
Staple vegetables (tomato, onion, green leafy, cabbage)	0.6	0.6	0.5	0.6	0.6	0.6
Pulses	0.7	0.4	0.7	0.5	0.7	0.4
Fish, seafish	1.2	0.6	1.1	0.6	1.2	0.6
Beef, fresh and frozen	1.7	1.3	1.9	1.3	1.7	1.3
Sugar and sweets	1.3	0.4	1.1	0.5	1.3	0.4
Non-alcoholic beverage (tea, coffee, cocoa, juices, soft drinks)	2.3	2.2	1.4	1.0	2.3	2.2
Plantains	2.5	0.3	1.3	0.5	2.5	0.3
Wheat products	2.6	0.5	1.4	0.9	2.6	0.5
Yams, potatoes, other roots and tubers	0.9	0.4	1.0	0.7	0.9	0.4
Alcoholic beverages (beer, wine, spirits, fermented)	1.6	5.8	0.7	1.5	1.6	3.7
Poultry, fresh and frozen	1.6	1.2	1.6	1.6	1.6	1.6
Cassava	0.1	-0.1	0.2	-0.3	0.1	-0.1
Oilcrops and vegetable oils	1.1	0.5	0.9	0.5	1.1	0.5
Milk & animal fats	1.3	1.0	1.4	1.2	1.3	1.0
Other foods (spices, treenuts, etc.)	1.0	0.1	0.8	0.5	1.0	0.1
Tropical fruits	1.3	0.8	1.2	0.9	1.3	0.8
Meat, other than poultry and beef	2.7	1.7	2.1	1.5	2.7	1.7
Sorghum plus millet & other cereals	0.7	0.4	0.7	0.3	0.7	0.4
Eggs	0.9	2.2	1.1	1.6	0.9	2.2
Other vegetables (okra, green beans)	0.2	-0.3	0.3	0.3	0.2	-0.3
Total foods	1.0	0.8				
Processing levels						
household production	0.8	-0.2	1.0	0.3		
unprocessed	1.1	0.4	0.6	0.7		
informal processing	0.5	0.4	0.4	0.5		
formal processing: low	1.5	0.7	1.3	0.9		
formal processing: medium	1.4	0.9	1.0	0.9		
formal processing: high	2.3	3.7	1.6	1.7		

Note: **Bold** elasticities were used in the baseline projections.

Sources: LSMS 2008 analysis.

Table L.3. Sensitivity Analysis: Food Market Growth Under Different Rates of Per Capita Income Growth*

Per capita income growth rate -->	Value Consumed 2050 (\$ billion/year)			Annual Rate of Growth		
	baseline	low	zero	baseline	low	zero
Prepared foods consumed away from home	46.6	28.2	17.4	5.4%	4.2%	3.0%
Alcoholic beverages	12.4	6.2	2.8	5.8%	4.1%	2.2%
Non-alcoholic beverage	16.5	9.1	4.9	5.9%	4.5%	2.9%
Eggs	2.4	1.4	0.8	5.1%	3.8%	2.5%
Meat, other than poultry and beef	5.2	2.6	1.6	4.4%	2.7%	1.5%
Beef	10.6	6.6	4.6	4.6%	3.5%	2.6%
Wheat products	6.8	4.5	3.6	3.9%	2.9%	2.5%
Plantains	6.5	3.4	2.5	3.5%	2.0%	1.3%
Poultry	5.9	3.4	2.3	4.0%	2.7%	1.8%
Fruits	4.4	3.0	2.4	3.5%	2.6%	2.1%
Milk and dairy products	4.6	3.0	2.4	3.5%	2.5%	1.9%
Rice	12.8	9.3	8.3	3.3%	2.5%	2.3%
Oilcrops and vegetable oils	4.2	3.2	2.8	3.3%	2.6%	2.3%
Fish	7.2	5.2	4.5	3.2%	2.4%	2.1%
Sugar and sweets	5.8	4.3	3.8	3.2%	2.5%	2.2%
Vegetables	8.6	6.9	6.1	3.1%	2.5%	2.2%
Yams, potatoes, other roots and tubers	3.7	2.8	2.5	2.7%	2.0%	1.8%
Other foods (spices, tree nuts, etc.)	3.0	2.6	2.5	2.5%	2.1%	2.1%
Pulses	6.0	4.7	4.4	2.3%	1.8%	1.6%
Sorghum and millet	1.7	1.3	1.2	2.3%	1.7%	1.5%
Maize and maize products	10.6	10.3	10.7	1.5%	1.5%	1.6%
Cassava	1.7	1.8	2.0	0.9%	1.2%	1.4%
Total	187.1	123.7	94.2	3.8%	2.8%	2.2%

* Per capita income growth rates

	rural	urban
baseline	1.8%	2.2%
low	0.5%	1.0%
zero	0.0%	0.0%