

# **UNIVERSITY OF DAR ES SALAAM**

## **INSTITUTE OF RESOURCE ASSESSMENT**



**Annual Report**

**July 2013-June 2014**

**COVER PHOTO:**

Two Floor Vertical Extension of the Institute of Resource Assessment Building of Block “B” (New Building), University of Dar es Salaam. Photo by C. Kikwaya.

**VISION AND MISSION****Vision**

“To become a high performing and reputable institution that excels in research, teaching and service provision to the community in natural resources management at national, regional and international levels.”

**Mission**

“To enhance sustainable capacity in human, financial and physical resources in order to excel in quality research, teaching and service provision to the community in natural resources management; and further IRA’s image as a centre of excellence in knowledge creation and skills development at a postgraduate level.”

## TABLE OF CONTENTS

COVER PHOTO:.....	I
VISION AND MISSION.....	I
TABLE OF CONTENTS.....	II
ACRONYMS.....	IV
BOARD OF DIRECTORS.....	V
DIRECTOR'S FOREWORD.....	VI
<b>1 SECTION ONE: OVERVIEW OF THE INSTITUTE.....</b>	<b>1</b>
<b>1.1 INSTITUTIONAL SET-UP.....</b>	<b>1</b>
<b>1.2 MANAGEMENT AND ADMINISTRATION.....</b>	<b>1</b>
1.2.1 <i>The Management Committee.....</i>	<i>1</i>
1.2.2 <i>Staff Matters.....</i>	<i>1</i>
<b>1.3 LINKS AND COLLABORATION.....</b>	<b>1</b>
<b>1.4 DEVELOPMENT OF PHYSICAL INFRASTRUCTURE AT THE INSTITUTE.....</b>	<b>2</b>
1.4.1 <i>Library Services and Documentation Unit.....</i>	<i>2</i>
1.4.2 <i>Information and Communication Technology Infrastructure.....</i>	<i>2</i>
1.4.3 <i>Vertical Extension of IRA Building block B.....</i>	<i>2</i>
<b>2 SECTION TWO: TRAINING AND TECHNICAL SERVICES.....</b>	<b>3</b>
<b>2.1 SHORT-TERM TRAINING AND FELLOWSHIPS.....</b>	<b>3</b>
2.1.1 <i>The African Climate Change Fellowship Programme.....</i>	<i>3</i>
<b>2.2 TEACHING AND SUPERVISION.....</b>	<b>3</b>
2.2.1 <i>Postgraduate Teaching.....</i>	<i>3</i>
2.2.1 <i>Supervision of NARAM Students.....</i>	<i>4</i>
2.2.3 <i>Supervision of PhD students at UDSM.....</i>	<i>7</i>
<b>3 SECTION THREE: RESEARCH AND COMMUNITY SERVICES.....</b>	<b>8</b>
<b>3.1 COMPLETED RESEARCH AND COMMUNITY SERVICE ACTIVITIES.....</b>	<b>8</b>
3.1.1 <i>Strengthen Local agricultural Innovation Systems in the Lake Victoria Basin to Improve Agricultural Production in Response to Challenges Associated with Climate Change and Variability.....</i>	<i>8</i>
3.1.2 <i>The Africa Adaptation Programme (AAP): Mainstreaming Climate Change Adaptation in the National Sectoral Policies of Tanzania.....</i>	<i>8</i>
3.1.3 <i>An In-Depth Assessment and Mainstreaming of Climate Change Vulnerabilities within Agriculture, Forest and Livestock Sectors.....</i>	<i>9</i>
3.1.4 <i>Preparation of National Guidelines for Sustainable Management of Wetlands in Tanzania.....</i>	<i>9</i>
3.1.5 <i>Preparation of Guidelines for Sustainable Management and Utilization of Rangelands in Tanzania.....</i>	<i>10</i>
3.1.6 <i>Preparation of Guidelines for Management of Environmental Emergencies in Tanzania.....</i>	<i>10</i>
<b>3.2 ONGOING RESEARCH AND CONSULTANCY.....</b>	<b>11</b>
3.2.1 <i>Rungwe Environmental Scientific Observatory Network (RESON) project.....</i>	<i>11</i>
3.2.2 <i>Implications of REDD Initiatives on Smallholders' Livelihoods through Access to Land in Manyara and Singida Regions: Mapping and Assessment of Challenges and Opportunities.....</i>	<i>11</i>
3.2.3 <i>The Partnership for Sustainable Community Development-Tanzania Partnership Programme (PSCD-TPP).....</i>	<i>11</i>
3.2.4 <i>Integrated Natural Resources Management Research Programme.....</i>	<i>13</i>
3.2.5 <i>The African Climate Change Fellowship Programme phase 111 (ACCFP).....</i>	<i>13</i>
3.2.6 <i>Mobility, Networks and Institutions and the Negotiation of Natural Resource Management in Contemporary Africa: Processes, Challenges and Prospects.....</i>	<i>13</i>
3.2.7 <i>Impacts of Climate Change on Water Resources and Agriculture - and Adaptation Strategies in Tanzania (CLIVET).....</i>	<i>14</i>

3.2.8	<i>Coordination of the Natural Resource Management (CBNRM) Policy Programme at WWF-Tanzania Programme Office</i> .....	14
3.2.9	<i>Participatory Capacity Building for Climate Change Adaptation in Agricultural Sector: The Case of Tanzania and Malawi</i> .....	14
3.2.10	<i>Enhancing the Measuring, Reporting and Verification (MRV) of Forests in Tanzania through the Application of Advanced Remote Sensing Techniques</i> .....	15
3.2.11	<i>Transdisciplinary Training for Resource Efficiency and Climate Change Adaptation in Africa (TRECCAfrica)</i> .....	15
3.2.12	<i>Participatory Capacity Building for Climate Smart Farming Innovations through Action Research: The Case of Bahi, Iringa and Longido Districts</i> .....	15
3.2.13	<i>Status of Land Degradation in Tanzania</i> .....	16
3.2.14	<i>Transformations in Poverty and Property Rights in Rural Tanzania</i> .....	16
3.2.15	<i>Valorizing Green Economy, Inclusive Growth and Employment</i> .....	17
3.2.16	<i>3.1.16 Species status, genetic diversity and conservation implications of neglected and underutilized plants from arid and semi arid regions of Tanzania</i> .....	17
<b>4</b>	<b>SECTION FOUR: PUBLICATIONS</b> .....	<b>18</b>
4.1.1	<i>Published Journal Articles</i> .....	18
4.1.2	<i>Journal Articles Submitted for Publication</i> .....	18
<b>4.2</b>	<b>RESEARCH REPORTS</b> .....	<b>18</b>
<b>4.3</b>	<b>CONSULTANCY REPORTS</b> .....	<b>18</b>
<b>4.4</b>	<b>CONFERENCE PROCEEDINGS</b> .....	<b>18</b>
<b>5</b>	<b>SECTION FIVE: FINANCES</b> .....	<b>19</b>
<b>5.1</b>	<b>SOURCES OF FUNDS</b> .....	<b>19</b>
5.1.1	<i>Government Sources</i> .....	19
5.1.2	<i>Own Sources</i> .....	19
5.1.3	<i>Development Partners</i> .....	19
<b>6</b>	<b>APPENDICES</b> .....	<b>20</b>

## ACRONYMS

ADP	Area Development Programme
AIACC	Assessment of Impact and Adaptation to Climate Change
CBD	Convention on Biological Diversity
CLEHA	Climate – Environment and Human Dynamics in Africa
CSITR	Central Slave and Ivory Trade Route Base Map
DA	Division of Antiquities
EAAlA	Eastern Africa Association for Impact Assessment
EAC	East African Community
EIA	Environmental Impact Assessment
EU	European Union
GIS	Geographical Information System
GISP	Global Invasive Species Programme
GoT	Government of Tanzania
IDRC	International Development Research Centre
IDS	Institute of Development Studies
ILRI	International Livestock Research Institute
IPCC	Intergovernmental Panel on Climate Change
IRA	Institute of Resource Assessment
IUCN	International Union for Conservation and Natural Resources
IWSD	Institute of Water and Sanitation Development
MSc.	Master of Science
MALISATA	Man-Land Inter-relations
MLA	Macro Level Assessment
MNRT	Ministry of Natural Resource and Tourism
NBS	National Bureau of Statistics
NCA	Ngorongoro Conservation Area
NEMC	National Environment Management Council
NGOs	Non-Governmental Organisations
NRM	Natural Resource Management
OPAC	Open Public Access Catalogue
PA	Protected Areas
PADEP	Participatory Agricultural Development Programme
PRAs	Participatory Rural Appraisals
REDD	Reducing Emission from Deforestation and forest Degradation
REPOA	Research on Poverty Alleviation
SADC	Southern African Development Community
SAREC	Swedish Agency for Research Cooperation
SEA	Strategic Environmental Assessment
SIDA	Swedish International Development Agency
START	System for Analysis, Research and Training for Global Change Science
SUA	Sokoine University of Agriculture
TANAPA	Tanzania National Parks
TANESCO	Tanzania National Electric Supply Company Ltd
TANRIC	Tanzania Natural Resources Information Centre
TANROAD	Tanzania Roads Agency
UCLAS	University Colleges of Lands and Architectural Studies
UDSM	University of Dar es Salaam
UNDP	United Nations Development Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
USA	United States of America
USAID	United States Agency for International Development
VPO	Vice President’s Office
WARFSA	Water Research Fund for Southern Africa
WMAs	Wildlife Management Areas
WVT	World Vision Tanzania
WWF	World Wildlife Fund for Nature

## **BOARD OF DIRECTORS**

The Board that started in 2012/2015 has continued to provide guidance to IRA.

### **IRA's Board Members (2012/2015)**

1. **Prof. A. E Majule**, Director/Chairman, Institute of Resource Assessment, University of Dar es salaam.
2. **Prof. F.P Maganga**, Associate Director and Coordinator, Social and Policy Analysis, Institute of Resource Assessment, University of Dar es Salaam
3. **Mr. S. B. Salula**, Permanent Secretary, Vice President's Office, Dar es Salaam
4. **Mr. P. Mkongwa**, Director Policy Planning, Prime Minister's Office- RALG, Dodoma
5. **Eng. B. T. Baya**, Director General, National Environmental Management Council (NEMC), Dar es Salaam
6. **Eng. M. Futakamba**, Deputy Permanent Secretary, Food Security Division, Ministry of Agriculture and Food Security, Dar es Salaam
7. **Eng. B. J. Mrindoko**, Deputy Permanent Secretary, Water Resources Division, Ministry of Water and Irrigation, Dar es Salaam
8. **Ms. L. Raphael**, Institute of Development Studies (IDS) University of Dar es Salaam
9. **Dr. P. K. Mwanukuzi**, Geography Department, University of Dar es Salaam
10. **Prof. A. G. Mwakaje**, Coordinator, Agricultural Food Security and Poverty Alleviation, Institute of Resource Assessment, University of Dar es Salaam
11. **Dr. C. Masao**, Coordinator, Natural Resource and Environment, Institute of Resource Assessment, University of Dar es Salaam
12. **Dr. J. G. Lyimo** Coordinator, Higher Degree Training Programmes, Institute of Resource Assessment, University of Dar es Salaam.
13. **Dr. Florian S. Silangwa**, Coordinator, Population and Human Settlement, Institute of Resource Assessment, University of Dar es Salaam
14. **Prof. R.Y.M. Kangalawe**, Coordinator, Information Technology and Remote Sensing, Institute of Resource Assessment, University of Dar es Salaam
15. **Mr. Oscar Sawuka**, Senior Administrative Officer/Secretary, Institute of Resource Assessment, University of Dar es Salaam
16. **One representative of MSc (NARAM) Students**

## **DIRECTOR'S FOREWORD**

During the reporting period (July 2013-June 2014), the Institute of Resource Assessment (IRA) continued to prepare a number of Programmes as a way of implementing the Research Agenda and Rolling Strategic Plan. The IRA puts much focus on the following activities:

- Implementation of the Research Agenda;
- Conducting applied and action research;
- Providing community services and short course training
- Implementation of the NARAM Master's Programme;
- Teaching and supervision of postgraduate students
- Implementation of the NARAM/ PhD Programme

The Institute continued with the implementation of the project planning process, whereby research proposals from its staff members were submitted to various funding agencies. The proposals were based on the five thematic areas presented in the IRA's Research Agenda, namely:

- (i) Natural Resources Management;
- (ii) Environment (including, among others, Climate Change Adaptation and Mitigation);
- (iii) Agriculture, Poverty Alleviation and Food Security;
- (iv) Population and Human Settlement;
- (v) Social and Policy Analysis.
- (vi) The Remote Sensing and Information Technology unit continued to support all the five research areas.

The Institute successfully continued with the implementation of the MSc. Programme on Natural Resources Assessment and Management (MSc. NARAM), with the admission of the fifth batch of 48 students. The Institute also initiated a PhD programme on Natural Resource Assessment and Management by receiving six applications of which three were officially registered. Members of staff were fully involved in the supervision of the second batch of PhD students, as shown in Section 2.3.

A number of recent events have raised the Institute's profile as far as climate change research is concerned. First of all, IRA continued to be a secretariat for REDD (Reducing Emission from Deforestation and forest Degradation), with the main task of preparing the National REDD Strategy through a consultative process. IRA continued to host the Pan-Africa START Secretariat (PASS) which was re-located to the Institute from the University of Nairobi in April 2007. It also continued to host two major programmes namely the African Climate Change Fellowship Programme (ACCFP) funded by IDRC and the Tanzania Partnership Programme (TPP) funded through Michigan State University (NSU).

With regard to international collaboration, IRA continued to collaborate with the Stockholm Environmental Institute (SEI) – a globally distributed institute with research centres in Sweden, Estonia, Thailand, the United Kingdom and the United States – which has established its Africa Centre at the Institute. Through SEI, a number of collaborative research and training activities were implemented including, Bio-resources and development and staff exchange visit from IRA to Sweden. Collaboration with Rockefeller Foundation through two key research and training programmes continued. The Institute through the Director and other academic staff also participated and/or facilitated various national and regional international meetings and workshops.

## 1 SECTION ONE: OVERVIEW OF THE INSTITUTE

### 1.1 Institutional Set-up

The Institute's mandate remains as presented in the 2012/2013 Annual Report, as per its interim constitution that stipulates its establishment, administrative structure and staffing. The Director manages the Institute. He/she is an appointee of the University Council and reports to the Deputy Vice Chancellor (Academic).

Through the office of the Director, IRA has two participatory organs which facilitate decision-making, i.e. the Board and the Management Committee. The former is a statutory organ of the University, whereas the latter is an informal but useful arrangement for assisting the Director to exploit the fertile treasure of ideas from the members of the Institute.

By this reporting period Prof A.E. Majule is the Director of IRA and Prof F.P. Maganga is the Associate Director. Mr. O. Sawuka was a Senior Administrative Officer; and Mr. D. Nassoro an Assistant Accountant assists the Director on administrative and financial issues. The Director is also advised by 5 research team leaders or co-ordinators that also form part of the Management Committee. These are the principal advisors to the Director and are responsible for planning and reviewing the Institute's research and academic activities, based on the University's guidelines. The Management Committee may also co-opt other staff when necessary and includes a representative from the administrative/technical staff.

### 1.2 Management and Administration

#### 1.2.1 The Management Committee

During the academic year 2013/2014, the Institute's Management Committee comprised the following staff members.

Leadership from 01/05/2012

Name	Position
Prof. A.E Majule	Director
Prof. F.P. Maganga	Associate Director and Coordinator, Social and Policy Analysis
Dr. F.S. Silangwa	Co-ordinator, Population and Human Settlements
Dr C. Masao	Coordinator, Natural Resources and Environment.
Prof. A.G. Mwakaje	Coordinator, Agricultural Food Security and Poverty Alleviation
Prof. R.Y.M. Kangalawe	Co-ordinator, Remote Sensing and Information Technology
Dr. J.G. Lyimo	Coordinator, Higher Degrees Training Programmes and Short courses
Mr. O. Sawuka	Senior Administrative Officer*

\*Up to

#### 1.2.2 Staff Matters

During the academic year 2013/2014, the number of staff members stood at 38 (22 academic, 7 technical staff and 9 administrative staff).

#### Training

Ms. Victoria Moshi, Mr. Joseph Perfect, Mr. Emmanuel Hanai, Mr. Simon Mwansansu, Mr. Noah Pauline, Mr. Elikana Kalumanga, Ms. Madaka Tumbo continued with their PhD studies while Mr Yusufu Katundu dropped from his PhD studies without giving a reason.

### 1.3 Links and Collaboration

During the academic year 2013/2014, the Institute continued to maintain links with local, regional and international institutions. Continuing links include those with System for Analysis, Research and Training for Global Change Science (START) on climate change issues, the French through IRD and University of Aix Marseille on research through Rungwe Environmental Scientific Observatory Network (RESON). IRA also continued to get support from IDRC/DFID for research and training activities on climate change, including a project on adaptation to climate change within the agricultural innovation systems in Tanzania and Malawi.

Also, collaboration was continued with several regional institutions including: the World Wildlife Fund for Nature (WWF); International Union for Conservation of Nature and Natural Resources (IUCN),

Southern Africa Institute for Environmental Assessment; International Association for Impact Assessment and; Eastern Africa Association for Impact Assessment (EAAIA). There was collaboration with the Stockholm Environmental Institute (SEI), under which joint research programmes are being developed and implemented in areas of common interest such as: Bio-resources and development, climate policy and adaptation, environmental policy, governance and institutions, sustainable water and sanitation, resilience and vulnerability; mainly through joint research projects, academic training, policy dialogues and communication activities, drawing upon available research resources from both parties.

Within Tanzania, collaborative research also continued with the Institute of Development Studies, Constituent College of Engineering, and College of Natural and Allied Sciences of the University of Dar es Salaam. Public service contracts were undertaken on a routine basis with government ministries such as the Vice President's Office, Ministry of Natural Resources and Tourism, Ministry of Agriculture and Food Security, Ministry of Water and Irrigation, Ministry of Livestock and Fisheries, and PMO (Regional Administration and Local Government). Other partners in the public service included Tanzania National Parks (TANAPA), National Environment Management Council (NEMC) and the National Bureau of Statistics (NBS). Also IRA continued to provide public services to local and international NGOs and development partners such as IUCN, WWF, UNDP and USAID.

#### **1.4 Development of Physical Infrastructure at the Institute**

##### *1.4.1 Library Services and Documentation Unit*

In the year 2013/2014, IRA's Documentation Unit continued to provide reading materials to the Institute's staff, other university staff, graduate and undergraduate students. The Documentation Unit is fully computerised, and over 450 papers and books have been catalogued and linked to the Main Library Computerized Open Public Access Catalogue (OPAC). That means readers can access documents successfully from the University Main Library website.

##### *1.4.2 Information and Communication Technology Infrastructure*

The computer facilities owned by the Institute offer several services including running a computerized information system in Natural Resources and the Environment; data processing and analysis of GIS activities; image processing; word processing; and database management including EIA. A computer has been installed in the Documentation Unit and links the Internet services with the University's main library. The IRA website is up and running, providing information to our stakeholders. The Institute's website is linked to the University website and other websites such as the government website, the Climate Change and Adaptation in Africa (CCAA), REDD website, Open Society Foundation (formerly the Open Society Institute) project website and others. Computers are provided to IRA's academic staff, GIS lab and also to students' computer rooms.

##### *1.4.3 Vertical Extension of IRA Building block B*

This was categorically planned by the Institute of Resource Management to increase availability of staff and working space in particularly seminars and meetings due to expansion of IRA academic activities. The vertical extension started in 2011 and is ongoing.

## 2 SECTION TWO: TRAINING AND TECHNICAL SERVICES

### 2.1 Short-Term Training and Fellowships

#### 2.1.1 *The African Climate Change Fellowship Programme*

The African Climate Change Fellowship Programme is jointly administered by the global change System for Analysis, Research and Training (START), the Institute of Resource Assessment (IRA) of the University of Dar es Salaam and the African Academy of Sciences (AAS). The programme is funded by the International Development Research Centre (IDRC) of Canada and DFID (UK). The purpose of the programme is to support African professionals, researchers, teachers and students to undertake activities that will increase their knowledge, capabilities and experience for advancing climate change adaptation in Africa. A variety of fellowship types are offered to support projects, research and other activities that advance adaptation in Africa. These are policy fellowship, PhD fellowship, Post-doctoral fellowship and teaching fellowships. More details can be obtained at <http://www.accfp.org>. The fellowships range in duration, from 2-18 months, and award amounts range from USD \$5,000- \$36,000, depending on the type of fellowship. Eligibility is limited to citizens of African countries. In November 2008, the ACCFP Executive Committee selected its inaugural 48 fellows for the first round. In 2011 the programme received funds to support fellows for 2 rounds, with IRA managing the most part of the programme. Two international staff were recruited and the first call for fellows to apply was advertised in June 2011. This programme is now in its third phase.

Researchers: Prof. A.E. Majule, Prof. R.Y.M. Kangalawe, Ms. M. Tumbo

### 2.2 Teaching and Supervision

#### 2.2.1 *Postgraduate Teaching*

During this period, all IRA's academic staff with PhD participated in teaching different courses under the MSc. (Natural Resources Assessment and Management) programme, as indicated in the following table.

Course Code	Course Title	Lectures involved
RM 600	Perspectives in Resource and Environmental Management	Prof. Sosovele, H.; Prof. Maganga, F.P., Prof. Ngana, J.O.
RM 601	Integrated Research Methodologies	Dr. Lyimo, J.G.; Prof. Yanda, P.Z.; Prof. Mung'ong'o, C.G; Ms. Kiwasila, H.
RM 602	Environmental Assessment	Prof. Mwakaje, A.G.; Prof. Sosovele, H,
RM 603	Contemporary Issues in Resource Management	Dr. Liwenga, E. T.; Prof. Mung'ong'o, C.G.; Prof. Maganga, F.P.
RM 604	Population, Development and Environment	Dr. Silangwa, F.S.
RM 605	Development Planning in Natural Resource Management	Prof. Kauzeni, A.S.; Prof. Maganga, F.P.; Dr. Lyimo, J.G.
RM 606	Tropical Ecosystem Management	Prof. Kangalawe, R.Y.M., Dr. Masao, C.A.; Dr. Lyimo, J.G.
RM 607	Applied Ecology	Prof. Yanda, P.Z.; Prof. Majule, A.E., A., Dr. Masao, C.A.
RM 608	Climate Change and Variability	Prof. Majule, A.E.
RM 699	Dissertation	All eligible academic staff

### 2.2.2 Supervision of NARAM Students

During the year under review, members of the academic staff participated in the teaching and supervision of MSc. (NARAM) students as shown in the following table:

SN.	Name of Candidate	Proposed Research Topic	Proposed supervisor
1	Robert Albert	Assessment of the Potentiality of Ecotourism to Conservation and Improvement of the Community's Livelihoods to the Communities Adjacent to Saadani National Park: The Case of Saadani Village	Prof. Mung'ong'o, C.G Ms. Moshi, V.
2	Mrema Haika	Contribution of Tourism Towards Poverty Reduction in Tanzania: A Case of Kilimanjaro National Park ( KINAPA)	Prof. Mung'ong'o, C.G.
3	Yvonne Chingarande	Assessing the Impact of Community Based Natural Resources Management on Communities Livelihoods and Economic Values of Natural Resources in Zimbabwe. The Case of Mbire District	Prof. Mwakaje, A.G.
4	Kinabo Claudia	Assessment of the Remaining Ecological Value of Pugu Forest Reserve and its Contributions to the Livelihood of Surrounding Community: The Case Study of Kisarawe District.	Dr. Lyimo, J.G.
5	Mushi Evamary	Analysis of Liquid Waste Management Strategies and its Effect on Environment in Informal Settlements: The Case Study of Keko Mwanga, Dar Es Salaam	Prof. Sosovele, H.
6	Kazuva Emmanuel	The Impact of Economic Instruments Application on Solid Waste Management in Dar es Salaam, Tanzania: The case of Kinondoni Municipality.	Prof. Mwakaje, A.G.
7	Abdulai Jalloh	Assessing the Role of Economic Incentive in Stimulating Waste Collection and Management in Tanzania. The Case of Dar Es Salaam City	Prof. Mwakaje, A.G.
8	Ezrome Lema	Assessing Communities' Willingness to Accept Compensation for Wildlife Conservation in their Areas: A Case Study of Rombo District	Prof. Mwakaje, A.G.
9	Sarmo Fortunata	Human- Wildlife Interaction in Relation to Water Use in The Ngorongoro Conservation Area.	Prof. Mwalyosi, R.
10	M Michael Deogratus	Natural Resources Conservation and Benefit Distribution in MBOMIPA wildlife Management Area	Dr. Masao, C.A.
11	Ndagula Jabir	The Governance Practices and their Implications on Wildlife Poaching. Comparative Assessment. The Case of Serengeti National Park and Ikorongo-Grumeti Reserve	Prof. Maganga, F.P. Mr. Perfect, J.
12	Tesha Susan	Community Attitude Towards the Existence of Wildlife Management Areas: The Case of Burunge WMA, Babati District, Manyara.	Prof. Maganga, F.P.
13	Kadilanha Sengati	Community Awareness on Environmental Implication of Gold Mining Tanzania: Case Study Buzwagi Gold Mine-Shinyanga	Prof. Mwalyosi, R.
14	Nashon Kezia	Impact of Land Alienation and Displacement in Mining Areas on the Livelihood of Local Community: A Case Study of Geita	Dr. Silangwa, F.S.
15	Sindamenya Dominick	Impacts of Artisanal Mining on the Socio-economic Conditions of the Local Community: A case Study of Maganzo Village in Kishapu	Dr. Silangwa, F.S.

		District, Shinyanga Region.	
16	Mananga Sikudhani	Assessment of Contribution of Village Community Banks to Income Generated From Urban Horticulture in Dar Es Salaam: A Case of Ilala Municipal Council.	Prof. Mwakaje, A.G.
17	Alexander Dominic	Contribution of Climate Smart Agriculture in Increasing Food Availability to Small Scale Farmer's Households: The Case of Ibingu and Kisongwe Villages, Kilosa District	Prof. Kangalawe, R.Y.M.
18	Glory Kasmir	Economic Analysis of Plantation Forest Ecosystem Services Against Other Land Use Practices in Tanzania: The Case of Smallholder Farmers in Mufindi District	Prof. Mwakaje, A.G.
19	Minja Gloria	Assessment of rural women knowledge on land degradation. A case of uluguru Mountain in Morogoro rural district	Dr. Liwenga, E. T.
20	Rashid ,Slim N	Assessment of participatory forest management towards improvement of Community livelihood. The case of Matipwili forest (Bagamoyo)	Prof. Maganga, F.P.
21	Rwebangira, Jackson	Assessing the Impact of price Fluctuation on Fisheries Conservation :Case of Nile Perch of lake Victoria in Kagera Region	Prof. Mwakaje, A.G.
22	Rutta Evodious	Assessment of Livelihood Options in enhancing sustainable forest resources management in Tanzania, case study of Kilwa district, Southern Tanzania	Dr. Liwenga, E. T.
23	Mawala Patrick	The Impact of Small Holder Irrigated Agriculture in Household's Poverty Reduction. The Case of Kilombero District, Morogoro Region, Tanzania.	Prof. Kangalawe, R.Y.M.
24	Nassor Majid	The Impacts of Climate Change on Rice Production at Chake Chake District in Pemba Island, Zanzibar.	Prof. Kangalawe, R.Y.M.
25	Antony Rodrick	Sustainability of Conservation Agriculture; The Case of Tupendane Group-Magoda Village Njombe	Prof. Majule, A.E.
26	Kitta Anastazia	Implication of Small scale Lime Production to the Livelihoods of Local Communities: A Case of Nanyala in Mbozi District	Prof. Majule, A.E.
27	Mayanja Sarah	Assessing the use of Liquefied Petroleum Gas Energy and Its Implication on Protecting Forest Resources: A Case Study of Kinondoni Municipality.	Prof. Mung'ong'o, C.G
28	Fadhili Mnyanga	Climatic Factors and Anthropogenic Activities Affecting Fresh Water Bodies: A Case Study of Mindu Dam in Morogoro Region	Dr. Masao, C.A.
29	Mdusi Jilolele	Assessment on Coastal Resource Management Along the Coastal Areas (Beaches): The Case Study of Bagamoyo District	Dr. Masao, C.A.
30	Mkumbo Zacharia	The Impact of HIV/AIDS Upon the Human Resources: Case Study of Bugando Medical Center Mwanza	Dr. Silangwa, F.S.
31	Chengula Greyson	Impacts of Lake Rukwa Fluctuation on Social Economic Condition of Communities Surrounding it	Prof. Mung'ong'o, C.G
32	Henjewe Evaristo	Assessing Water Management Practices and their Implication on Sustainability of Water	Prof. Mwalyosi, R.

		Sources: A case of Mchuchuma River in Ludewa District.	
33	Mulela Holloh Noah	Analysis of the value chain for <i>Engraulicypris sardella</i> (Usipa) fishery of the Lake Nyasa in Tanzania. A case of Kyela, Mbinga and Dar es salaam	Prof. Mwakaje, A.G.
34	Margreth Elibariki	The Governance Of Upgraded Settlements On The Context Of Climate Change Adaptation; a case of Isakalilo and Mwangata in Iringa Municipality	Prof. Maganga, F.P.
35	Machenje Evidence	An assessment of Urbanization and its Impact on Land-Use/Land-Cover Change: The case of urban area in Iringa Municipality	Dr. Lyimo, J.G.
36	Dickson Mwinuka	Promoting sustainable biodiversity and ecosystem services to support the life of generations towards prospective habitant banking system in Tanzania.	Prof. Mwakaje, A.G.
37	Kapalata Fidelis	Perceptions and Attitudes of Local Communities towards Protected Areas in Tanzania: A case of Kilimanjaro National Park.	Dr. Masao, C.A.
38	Mnyambo Gerald	Contribution of private sectors toward payment for watershed and forest services in Tanzania, the Case study of Tanga region.	Prof. Mwakaje, A.G.
39	Maingu Rebecca	Contribution of Improved cooking stoves technologies to reduction of deforestation process in Tanzania	Dr. Lyimo, J.G.
40	Omar Ramadhani	Contributions of Wetlands in Poverty alleviation in Mtwara rural district. The case study of Kitere wetlands	Dr. Masao, C.A.
41	Mutesa Frank,	Assessing smallholder farmers constraints and opportunities in maize production in three contrasting agro ecological zones of Rwanda	Dr. Lyimo, J.G.
42	Deogratias J. Khan	Impact of Climate variability to Pastoral society/Societies in Musoma Rural	Prof. Yanda, P.Z.
43	Richard Caroline	The impacts of wildlife conservation to the surrounding communities in protected areas. A case of Tarangire National Park	Prof. Maganga, F.P.
44	Selestine Will-elimina	Public Participation Practices in Environmental Impact Assessment in Tanzania: A Case of Gas Exploration and Gas Pipeline Construction in Mtwara Region	Prof. Mwalyosi, R.

### 2.2.3 Supervision of PhD students at UDSM

IRA is also running a PhD programme in Natural Resource Assessment and Management by thesis. The names of the candidates who had registered by June 2014 are as listed in the following table. Some IRA staff also participated in supervision of PhD candidates in other academic units of the University.

No	Name	Research topic	Supervisors
1.	Mr Allan Kijazi	Impacts of Climate Change and Variability on Pastoral Wildlife Land Use systems in Tarangire-Manyara Ecosystem, Tanzania	Prof. Yanda, P.Z. Prof. Mung'ong'o, C.G
2	Mr Conrad Ndomba	The Impacts of Climate Change and Variability on Livestock Production in Tanzania: Case of Usangu Plains in Mbeya Region	Prof. Maganga, F.P. Prof. Majule, A.E.
3.	Yassin Mkwizu	Examining the Effectiveness of Information and Knowledge Management Techniques in Climate Change related Initiatives in Tanzania	Prof. Kangalawe, R.Y.M.
4.	Mr Tumwine Jotham	Effects of Post-harvest Residue Management Practices on Banana Weevil Population Dynamics in South- Western Uganda	Prof. Kangalawe, R.Y.M. Dr. Liwenga, E.T.
5.	Ms. Elitruder R. Makupa	"Socio-Economic Impact of Land Acquisition and Compensation in Tanzania	Prof. Mung'ong'o, C.G
6	Ms. Upendo Matotola	Assessing the Effectiveness of payments for watershed services in improving water quality and quantity in Tanzania: The Case of Ulunguru Mountains.	Prof. Mwakaje, A.G.
7	Ms. Diana R. Mndeme	Contribution for Payment for Environmental Services (PES) on Communities Livelihoods in Upper Catchment areas of Uluguru Mountains	Prof. Sosovele, H.
8	Mr. Brown Gwambene	Assessment of Agricultural Production dynamics in the context of Climate Variability in Rungwe District, Tanzania	Dr. Liwenga, E.T. Prof. Mung'ong'o, C.G.
10.	Ms Angelingisi Makatta	Assessment of Governance in Participatory Forest Management for REDD readiness in Tanzania. A Case study of Manyara Region	Prof. Maganga, F. P. Prof. Majule, A.E.
11	Berling Sospeter Magolyo (IDS)	Livelihood dynamics of fishing communities in response to declining fisheries resources. A case of selected Islands in Lake Victoria, Tanzania	Dr. Niboye, E.P. (IDS) Prof. Kangalawe, R.Y.M.
12	Amina K. Kaumo (Geography Dept)	Assessment of climate change impacts on freshwater provision to community in Pangani River basin, Tanzania	Prof. Mwakalila, S.S. (Geography Dept.) Prof. R.Y.M, Kangalawe.
13	Atupakisye Samwel	Assessment of Impacts of Livelihood diversification on Land use Management practices in Tanzania	Prof. Kangalawe, R.Y.M. Dr. Lyimo, J.G.
14	Mugabe, Paschal	Climate Variability Impacts on Food Security in Tanzania. The case of Bagamoyo District (TRECCAfrica PhD research, From 2012/2013)	University of Ghana; Prof. Kangalawe, R.Y.M.
15	Ndesanjo, Ronald	Increasing Resilience in a Changing Climate among Pastoral Systems of Northern Tanzania	Prof. Maganga, F.P. Dr. Theilade, I. University of Copenhagen
16	Nyunza, Godfrey	Assessing the Potential and Conditions for Geographical Indicator Labels to Valorize Honey Production in Tanzania: The Case of Manyoni and Uyui Districts	Prof. Maganga, F.P. Prof. Mwakaje, A.G.

### 3 SECTION THREE: RESEARCH AND COMMUNITY SERVICES

#### 3.1 COMPLETED RESEARCH AND COMMUNITY SERVICE ACTIVITIES

##### 3.1.1 *Strengthen Local agricultural Innovation Systems in the Lake Victoria Basin to Improve Agricultural Production in Response to Challenges Associated with Climate Change and Variability*

This project intends to build the capacity of farming communities in the Lake Victoria Basin to effectively respond to the impacts of climate change on the agricultural systems. The project will develop an understanding of the climate change issues at community level, including perceptions, impacts, vulnerabilities, adaptation and future plans in order to adapt. Of more interest will be to examine different potential agricultural innovations in combination with traditional methods for producing food to achieve food security in selected case studies in the LVB region and strategize on how these can be promoted. The main objective of the research is to strengthen the capacity of small-scale farmers in the LVB to adapt to climate change and variability for enhancing agricultural productivity, using appropriate innovations for poverty alleviation and ensuring food security in the Basin. Specific objectives of the project are: (1) To review and collate appropriate crop production innovations in the LVB; (2) To assess the magnitude of climate change and variability impacts to small scale farmers; (3) To assess the strengths, weaknesses, opportunities and threats of the current adaptation strategies; and (4) To introduce and demonstrate appropriate agricultural innovations that are suitable and more adaptable to climate change and variability in the LVB region. Field work has been conducted in Bunda, Magu and Ngara districts in the Lake Victoria Basin.

**Participating Researcher: Prof. A.E. Majule**

##### 3.1.2 *The Africa Adaptation Programme (AAP): Mainstreaming Climate Change Adaptation in the National Sectoral Policies of Tanzania*

Tanzania is currently implementing the Project titled “Mainstreaming Climate Change Adaptation (CCA) in National Sectoral Policies of Tanzania”. The project is part of the broader Africa Adaptation Programme (AAP), a Programme which is implemented in 21 African countries with financial support from the Government of Japan through the United Nations Development Programme (UNDP) country offices. The project seeks to mainstream CCA mechanisms in Tanzania’s policy, development and investment frameworks and expects to achieve five outputs namely: introduction of long-term mechanisms that can cope with climate change uncertainties; strengthened leadership and institutional frameworks that can manage climate change risks and opportunities; enhanced climate change resilient policies and measures in priority sectors; national adaptation financing options established and dissemination of climate change knowledge generated, stored and shared nationally, regionally and internationally. The project focuses on enhancing of CCA skills of government (national and local government levels), development partners, private sector, civil society and the general public. In Tanzania, the project was implemented by eight Implementing Partners (IPs), including government ministries and institutions, and coordinated by the Vice President’s Office. The implementing partners are the Vice President’s Office – Division of Environment, the First Vice President’s Office – Department of Environment in Zanzibar, Ministry of Finance, Ministry of Education and Vocational Training, Ministry of Community Development, Gender and Children, National Environment Management Council (NEMC), Tanzania Meteorological Agency (TMA) and the Institute of Resource Assessment (IRA) – University of Dar es Salaam. Implementation of the project started in mid-April 2011, and was completed in March 2013.

In this project the Institute of Resource Assessment participated in the Activity Result 1: Climate Change information base expanded and recommendations integrated into long-term national planning and decision making processes, such as MKUKUTA and MKUZA, GOT 5-year national, local government and sectoral strategies and plans. Action (1): "Collect and consolidate information on climate risk vulnerability, climate change impacts, adaptation options in sectors such as energy, forestry, wildlife, water (inland and coastal), agriculture, health, gender, infrastructure, livestock and fisheries, tourism and link with existing socio-economic data by UDSM, NEMC, SUA, TMA and others for planning by MDAs and LGAs; and Action (2): “Research and document indigenous knowledge on adaptation of farmers and pastoralists in areas not targeted by the IDRC research programme under IRA.”

Information issues related to climate change adaptation that the various sectors are involved in has been collected and analysed to examine the extent of vulnerability of the sectors to climate change and how it is addressed by the sectoral policies. The analysis further aims at identifying the capacity gaps for addressing the challenges of climate change in the sectors. The identified sectors involved include energy, forestry, wildlife, water, agriculture, health, gender, infrastructure, livestock and fisheries and tourism. Fieldwork was undertaken in selected villages in the pilot Igunga district. The fieldwork was aimed at capturing the local perceptions on climate change; how communities learn about climate change; climate trends (especially rainfall and temperature) during the last 20 years; local indicators of changing climate; types of farming systems practiced and changes over time; major problems related to livestock production; land use/cover changes over time; and adaptation practices that have been used by the communities that use indigenous knowledge. A final report was submitted to the Vice President's Office, Division of Environment.

*Participating Researchers: Prof. R.Y.M. Kangalawe, Dr. J. Lyimo, Prof. M.R. Mujwahuzi, Prof. A.E. Majule and Prof. P.Z. Yanda*

### *3.1.3 An In-Depth Assessment and Mainstreaming of Climate Change Vulnerabilities within Agriculture, Forest and Livestock Sectors*

In Tanzania, climate change and/or variability poses a serious risk to development due high dependence on climate sensitive economic sectors such as agriculture, forestry and livestock with most grassroots communities living below the poverty line. Previous studies had predicted that climate change would challenge the adaptive capacities of many different communities, and overwhelm some, by interacting with and exacerbating existing problems of food security, water scarcity and the scant protection afforded by marginal lands. Most of these impacts are so far been witnessed in nearly all parts of Tanzania. Realizing the implications of climatic change so far has called for increased efforts from global, regional to national levels to address the challenges associated with climate change. It is through this need that the Vice President's Office (VPO) in collaboration with NEMC and Ministry of Finance with support from the United Nations Development Program (UNDP) jointly implemented a Project code-named "Mainstreaming Environment and Climate Change Adaptation in the Implementation of National Policies and Development Plans". The Project aimed to strengthen Tanzania's national capacity for climate change adaptation. The objective was to ensure that environment and climate change are mainstreamed into the sectoral plans, programs and projects.

In this project IRA engaged in conducting an in-depth assessment of the process of mainstreaming environment and climate change adaptation and mitigation strategies into national policies, strategies and development plans. The assessment and advice provided focused much on Agriculture, Livestock and Forestry sectors.

*Participating Researchers: Prof. Amos Enoch Majule, Prof. Richard Y. M. Kangalawe, Dr. James G. Lyimo, Dr. C. A. Masao and Mr. S. Mwangi.*

### *3.1.4 Preparation of National Guidelines for Sustainable Management of Wetlands in Tanzania*

Section 56, Subsection (5) of the Environmental Management Act (2004), requires that "The Minister in consultation with other sector ministries may make regulations and guidelines on the sustainable management of wetlands protected under this Act". So far in Tanzania, the policies and legislations related to wetlands and environmental degradation and management are in place. However, wetlands management guideline is important in helping to develop new and innovative approaches towards integration of land-use planning, water resource management and natural resource management.

The role of IRA in this assignment therefore was to prepare a guideline to lead on Sustainable Management of Wetlands. It covered procedures for: identification and establishment of wetlands, wetland integrated management plan, activities to be carried out and in the wetland, assessment of the inventory and state of natural resources provided by wetlands as well as procedures for carrying out comprehensive assessments. It also covered procedures for: wetland resources use, monitoring programmes, surveys, researches, controlled tourism, restoration or enhancement programmes in the protected wetlands, rehabilitation as a management response, management issues in a specific wetlands, urgency and conservation priority, establishment of an effective and efficient institutional and legal framework for integrated management and wise use of wetlands, communication, education and public awareness among stakeholders and promotion of partnership and cooperation.

Participating Researchers: *Prof. Amos Majule, Prof. Mark Mujwahuzi, Dr. Catherine A. Masao and Mr. Sixbert Mwanga*

### *3.1.5 Preparation of Guidelines for Sustainable Management and Utilization of Rangelands in Tanzania*

The fact that Rangelands are an important resource with intrinsically valuable resources in Tanzania is undisputable as it accommodates biodiversity of variety of animal and plant species of economic, ecological and socio-cultural values. However, these areas and nearby lands have long been subjected to a number of challenges which complicate their management, thus putting the resource at risk of over exploitation and degradation. These challenges, inter alia, include: failure of conservation to compete effectively with alternative land uses, habitat degradation and blockage of wildlife corridors, overexploitation and illegal resource extraction, wildfires, human population growth, poverty, increased human-wildlife conflicts as well as livestock keepers and crop cultivator's conflict.

The main objective of the project and these Guidelines is to provide practical guidance on Sustainable Management and Utilization of Rangelands as required by the Environmental Management Act (Cap. 191), in order to improve rangeland management and utilization, support sustainable productivity of livestock and wildlife, and improve pastoral and agro-pastoral livelihoods. Specifically, these Guidelines intended to:

- identify an approach that would facilitate and manage change in the rangelands to ensure options for the future are retained;
- maintain rangeland resources and conserve their biological and cultural heritage;
- balance the diverse economic, cultural and social needs of rangeland residents and users; and
- establish a framework for those with interests in rangelands to develop strategies and actions to manage change and ensure a viable legacy for future generations.

Participating Researchers: *Prof. Amos Majule, Prof. C.G. Mung'ong'o, Prof. A.S. Kauzeni and Dr. James Lyimo*

### *3.1.6 Preparation of Guidelines for Management of Environmental Emergencies in Tanzania*

Tanzania like many other developing countries has experienced a number of environmental emergencies since her independence in 1961. Common environmental emergencies and disasters in the country have been epidemics, pest infestation, drought, floods, major transport accidents, industrial accidents, refugees and fires. These environmental emergencies have lead to loss of lives, destruction of infrastructure and adverse impacts to the country's economy.

To address challenges related to environmental emergencies, the Environmental Management Act (EMA 2004), Section 229 (1) authorize the Minister responsible for environment in the Vice President's Office (VPO) to prepare guidelines for the management of environmental emergencies. Cap. 191 of the Act require different sectors to address emergencies in their respective undertakings.

The purpose of these guidelines is to respond to the EMA (2004) requirements. The guidelines provide government sectoral ministers and private institutions with guide for preparedness in the event of environmental emergencies. The guidelines are on experience accumulated from local, national and international environmental emergency responses. Based on Environmental Management Act, 2004 (Section 229.-(1) these guidelines cover detailed explanation in dealing with environmental emergencies related to:-

- i. major oil spills and gas leakages;
- ii. spills of other hazardous substances;
- iii. industrial accidents;
- iv. natural disasters such as floods, droughts and major pest
- v. infestations or other intrusions of alien species of fauna and flora;
- vi. influx of refugees; and
- vii. fire.

Participating Researchers: *Prof. Agness Mwakaje, Dr. Florian Silangwa*

## 3.2 ONGOING RESEARCH AND CONSULTANCY

### 3.2.1 *Rungwe Environmental Scientific Observatory Network (RESON) project*

This is an ongoing research project in the Rungwe Volcanic areas of Tanzania. It is an extension of the previous CLEHA project. The current project is funded by CORUS programme, involving the North and South scientists. The project seeks to establish an observatory station in Masoko village where Lake Kisiba, a crater lake is located. Specifically, the project aims to (i) To study the contribution of climate change and variability on the livelihood and other environmental processes such as volcanic activities; (ii) To reconstruct the past climate environment based on the present; and (iii) To establish an observatory centre on climate-related studies at Masoko in Rungwe. The project benefits both local communities in terms of research, training and development issues. Scientists involved are from France, Belgium and UK, who form the south team. Scientists from the University of Dar es Salaam (IRA, Geology, and Botany) are involved. Progress to date includes establishment of an observatory station on various scientific issues including monitoring plots, research on different environmental issues including climate change and others.

*Participating Researchers from IRA: Prof. A.E. Majule, Prof. R.Y.M. Kangalawe, Dr E.T. Liwenga, Dr. J.G. Lyimo and Dr C. Masao*

### 3.2.2 *Implications of REDD Initiatives on Smallholders' Livelihoods through Access to Land in Manyara and Singida Regions: Mapping and Assessment of Challenges and Opportunities*

Pressure on land in Tanzania is increasing through population growth and rising international interest in cheap African land. This latter process is resulting in 'land grabbing'. More than 40 % of the land in Tanzania is under conservation. When Reduction of Emission from Deforestation and Degradation (REDD) is now being introduced in Tanzania, the new projects should be seen in a broader regional context in order to try avoiding adverse effects on smallholders' access to resources and, hence, to their livelihoods. This interdisciplinary project will focus on Manyara Region and examine the implications of REDD initiatives on smallholders' access to land. The gender dimensions of these challenges will be analysed. Remote sensing and Geographical Information Systems will be applied to analyse land use changes. Qualitative methods will be used at the selected sites. Strategies to meet the challenges of access to land and resources for smallholders will be identified in relation to livelihood security and gender equity. This project will produce important knowledge for Manyara Region and constitute a pilot project with the elaboration of an approach that can be replicated in the implementation of REDD in the other regions in Tanzania as well as in other countries. The overall objective of the research important project is to contribute to the elaboration of REDD initiatives in Tanzania by evaluating the implication of REDD on smallholders' livelihoods through access to land. The project is designed as a pilot project to be carried out in Manyara and Singida Regions, particularly in Duru Haitemba and Mgori villages respectively. Specific objectives include the following: (a) To examine potential areas for REDD initiatives in the context of the existing land uses and projected land use changes; (b) To assess the challenges and opportunities REDD may present on livelihood security through changes in access to land for smallholders; (c) To investigate gender differences associated with REDD on access to land for smallholders; (d) To recommend different strategies to meet the identified challenges; and (e) To provide substantially to capacity-building. The project is funded by the Norwegian Government through Sokoine University. To date a Stakeholders' workshop has been conducted in both study areas whereby different forest management issues related to REDD have been raised. Mapping of land uses in study areas in order to establish changes have started. Also, four Master's students have been admitted at IRA as part of capacity building through UDSM.

*Participating Researchers: Prof. A.E. Majule, Prof. F.P. Maganga, Dr. J. Abdala and Dr. Mwaipopo*

### 3.2.3 *The Partnership for Sustainable Community Development-Tanzania Partnership Programme (PSCD-TPP)*

The Partnership for Sustainable Community Development-Tanzania Partnership Programme abbreviated as PSCD-TPP, is a 5-year programme which started in Tanzania in January 2008. The programme was first of all established in 2007 under the International Studies and Programmes at the International Centre of the Michigan State University in USA. At Michigan State University, Dean of the Centre for International Programmes is the Overall in-charge of the PSCD-TPP. In Tanzania, the programme is implemented by the Institute of Resource Assessment (IRA), Dar es Salaam University College of Education (DUCE) and the Aga Khan Foundation (AKF). The overall in-charge of the programme is the Director of the Institute of Resource Assessment, where the project is housed. The

Director of IRA is assisted by a Team Leader and sectoral professional staff from DUCE, AKF, and IRA who provide professional advice to district authorities and extension workers who are the key implementers of TPP supported activities. TPP activities cover mainly water supply for human beings and livestock, school health and feeding programme, and training for capacity building.

The aim of the programme is to improve community well-being, while generating knowledge about the development process itself. It also aims at establishing long-term collaboration among scholars, development professionals, government and non-governmental organizations and local people in order to improve local level livelihoods, human and animal health and to strengthen local capacity for sustainable development. In Tanzania, PSCD-TPP is being implemented in Naitolia village, which is 72 km from Monduli District Town and in Milola A and B villages in Lindi District (62 km from Lindi Rural District). Funding for the PSCD-TPP is donated by a private family in USA and is channelled through the Michigan State University (MSU) to IRA.

Research has been undertaken by both students (Master's, PhD) and faculty members from Tanzania and MSU in USA, for stimulating knowledge generation through testing of theories and development models is part of TPP's interest. During the year 2013-14 most of the students and faculty members who received research funds during this period went for fieldwork and some had already produced their draft dissertations by the time of this reporting. The IRA students who received research funds last year were in their final stages of their dissertation work. One had already submitted his dissertation to the external examiner. Others were in their final stages of compiling theirs before submitting them to the external examiners.

As for the faculty members who received research funds, they have already gone to the villages to collect data and most of them were during this time writing their reports. One of the faculty members was also able to travel to Milola to provide research feedback to the community before finalizing his report for submission.

New research proposals have been received for TRIG FY 2015 research funding and they were being reviewed by the time of this reporting.

Apart from research, the following community projects have been funded and implemented by TPP during the FY 2013-2014:

- **Training for capacity building of TPP-related village committees.** The training also involved community-wide meetings for democratic selection of committee members and for awareness raising about TPP-supported issues.
- **Improving water access and quality-** borehole-piped water supply scheme the centre of Naitolia Village in Monduli was finalized. Support to gravity-fed piped water supply in Milola A&B was accomplished.
- **Human Health and Hygiene** - mainly supports the two districts' country school health programme through training of the school health team (District, village, school), provision of health cards and tools (microscopes, weighing machines) for body examination and reagents for screening the pupils as required by the government, to facilitate early detection and treatment of diseases by the health authorities, improved class attendance, retention and improved exam passing rate. This activity is on-going.
- **Animal Health** - Implemented in Monduli District in the Maasai community. The cattle dip was successfully built in the reporting period. The training of village livestock committee members and caretakers of livestock as village-based veterinary volunteers for vaccinating and treating emergency cases continued.
- **Out-sourcing funds to cover miscellaneous community's needs.** PSCD-TPP has limited funds but it out-sources extra funds from different international and local funding organizations/programmes to address the many community needs that are beyond the capacity or priority areas of TPP programme. This activity continued during the reporting time.

**Participating Researchers:** From IRA: Prof. C.G. Mung'ong'o, Prof. R.Y.M. Kangalawe, Mrs Mary Lucumay-Malekela, and Adeline Dyauli; from DUCE: Dr. Emiliana Mwita, Gasper Nturu Shoo (DUCE); from SUA: Prof. S. Kimera and Prof. Mellau, and Mr. Boniface Mbonju from AKF.

#### *3.2.4 Integrated Natural Resources Management Research Programme*

This is a five years collaborative research programme between IRA and Swedish institutions that addresses issues of importance and concern to Tanzania, relating to two sub-programmes namely, environmental and natural resources exploitation, governance and management of particular wetlands and lake basins. Wetlands and lake basins are a type of ecosystems that hold immense benefits to human beings. They control floods and filter toxins, pollutants and sediments before they are introduced into major water bodies. They are also important habitats for fish; provide feeding grounds and refuge for certain terrestrial animals and birds. They are resting stations for certain birds; and provide for livelihood and recreation grounds for human beings. Many wetlands and lake basins are also rich in biodiversity and are unique landscapes providing aesthetic and cultural values, as tourist sites. The key area of this programme is capacity building within the University in the area of research, policy development, good natural resources governances and advocacy through providing research opportunities to postgraduate students in areas related to natural resources management and governance. Training among others aims at sponsoring Master's and PhD students who would study and write on integrated natural resource management including governance issues. The various projects in the programme will be carried out in collaboration with both Tanzanian and Swedish collaborating institutions. To a large extent, the Swedish collaborators are involved in student supervision, especially for Ph.D students who are under sandwich programme. The programme is funded by SIDA/SAREC Fund through UDSM.

*Participating Researchers: Mr. S. Mwansasu, Mr. E. Kalumanga, Mr. Y. Katundu; and three supervisors from IRA.*

#### *3.2.5 The African Climate Change Fellowship Programme phase III (ACCFP)*

The African Climate Change Fellowship Programme (ACCFP) aims to support African professionals, researchers and graduate students to undertake activities that will enhance their capacities for advancing and applying knowledge for climate change adaptation in Africa. The first phase of the programme was jointly administered by the global change SysTem for Analysis, Research and Training (START), the Institute of Resource Assessment (IRA) of the University of Dar es Salaam and the African Academy of Sciences (AAS), with financial support from the International Development Research Centre (IDRC) of Canada and the United Kingdom's Department for International Development (DFID). In phase I, the programme provided four types of fellowships, namely, Policy Fellowships, Doctoral Research Fellowships, Post-Doctoral Fellowships and Teaching Fellowships.

The second phase is administered by the Institute of Resource Assessment (IRA) as part of the devolution process from START to an African institution. The ACCFP is awarding fellowship grants that will enable fellows to visit other institutions (referred to as "Host Institutions") to undertake a project or activities that will increase their knowledge, capabilities, and experience for advancing climate change adaptation in Africa. While in residence at a host institution, fellows will execute a fellowship project of their own design. A wide range of projects are supported, including, for example: (i) learning what others are doing to manage climate risks and adapt to climate change, how they assess and prioritize climate risks, current practices for designing and implementing adaptation projects, and approaches for integrating adaptation with programme planning and policy; (ii) undertaking research that supports adaptation decision-making; and/or (iii) developing and implementing curricula for integrating climate change and climate change adaptation into graduate level education.

*Participating Researchers: Prof. A.E. Majule, Prof. R.Y.M. Kangelawe, Ms M. Tumbo, Mr B. Gwambene*

#### *3.2.6 Mobility, Networks and Institutions and the Negotiation of Natural Resource Management in Contemporary Africa: Processes, Challenges and Prospects*

This project investigates the relation between migration and natural resource management. This is an important and urgent question in the era of globalisation characterised by an increasing flow of people, ideas and capital and a proliferation of new forms of regulation of social-ecological systems. These new mobility dynamics have led to a growing heterogeneity of resource users, dislocated forms of decision making, the hybridization of knowledge, bearing upon resource utilization and institutional development engaging migrants, diasporas, administrations as well as locals in decisions on local resource use. New coalitions but also new conflictive arrangements have led to the emergence of entirely new forms of collective action within social-ecological systems. Our project will facilitate research and build capacities and partnerships specifically around the changing organization of natural

resource management in relation to mobility and migration and view social-ecological dynamics mainly but not exclusively from a social sciences perspective.

*Participating Researchers: Prof. P.Z. Yanda, Mr. E. Hannai, Mr. F. Silangwa*

### *3.2.7 Impacts of Climate Change on Water Resources and Agriculture - and Adaptation Strategies in Tanzania (CLIVET)*

The overall objective of the project is to contribute to the development of capabilities of Tanzania to encounter the impacts of climate change and develop best strategies to adapt to these changes, particularly as they relate to water resources and the use of water within the agricultural sector. The long-term objective is to increase the resilience of the rural communities towards climatic changes. Further, the project aims at predicting likely climate changes; the associated impact on water resources availability and the future conditions for agricultural production. The specific objectives of the project are: (i) to support the building of individual and institutional capacity to do research within climate change, the prediction of climate changes at various scales, and the related impacts on the hydrology and water resources for agriculture of selected regions in Tanzania; (ii) to support the building of individual and institutional capacity to do research within potential adaptation strategies related to water use in the agricultural sector and to analyze the existing and potential new adaptation strategies and their socio-economic and environmental consequences; (iii) to inform national and development assistance policy dialogue on the appropriate climate change adaptation strategies in water management within the agricultural sector; and (iv) to build climate change research alliances between North-South partners and support international research collaboration to address issues of climate change in agriculture and water management.

Studies are being conducted in mountain regions in Tanzania, where opposing trends in climate change are foreseen. The studies are being conducted in collaboration with the Department of Geography and Geology, University of Copenhagen (Denmark) and Hanoi Agricultural University (HAU) (Vietnam).

*Participating Researchers: Prof. P.Z. Yanda, Dr. E.T. Liwenga, Mr N. Pauline and Ms T. Madaka*

### *3.2.8 Coordination of the Natural Resource Management (CBNRM) Policy Programme at WWF-Tanzania Programme Office*

This is an activity which WWF contracted UDSM through the UCB to coordinate and facilitate Government implementation of NRM policies. The programme receives funding from USAID that is channelled to WWF. This is not a full-time assignment but a consultancy that UDSM and WWF have agreed. Through this arrangement, Prof Sosovele is the Programme Director coordinating the activities of the CBNRM Policy team at WWF, helping the Government to implement the Environmental Policy and Wildlife Policy of Tanzania. Several environmental laws and capacity development programmes have been developed through this programme under his coordination. Several villages have established Wildlife Management Areas (WMAs) and are now generating revenue from tourism-related business ventures. Based on the previous successes, the Government and USAID have scaled up the programme to include several areas with the potential to conserve natural resources and expand into more areas of conservation that would increase benefits to communities. The programme is continuing up to 2015.

*Participating Researchers: Prof. H. Sosovele*

### *3.2.9 Participatory Capacity Building for Climate Change Adaptation in Agricultural Sector: The Case of Tanzania and Malawi*

The overall objective is to strengthen the capacity of vulnerable rural communities and institutions in Tanzania and Malawi to better adapt to climate change and variability for enhanced sustainability of agricultural production.

Specifically, this action research project aims to:

- (1) Building and strengthening the capacity of climate change vulnerable farming communities to enhanced adaptation in agricultural production through actions (training and research) using the innovation system approach.
- (2) To improve service, information and product delivery by agricultural boundary partners such as extension, NGOs, stockiest, media, meteorological agencies and policy makers to target communities through shared and facilitated learning.

- (3) Strengthening research on climate change adaptation in agriculture through partial training support to 4 postgraduate (Masters Degree, 2 each for Tanzania and Malawi) students in doing their dissertations along the project overall objective. It is planned at least 6 papers will be published in peer-reviewed journals based on the M.Sc. dissertations.
- (4) Learning and documenting what performs better and could be up-scaled with greater investments and provide such information to policy makers.

A key element of this project is how to improve sharing and learning of information and experiences. This reflects participatory monitoring evaluation by applying few key relevant questions targeted to various stakeholders in case study sites.

*Researchers: Prof A.E. Majule, Prof R.Y.M. Kangalawe, Dr J.G. Lyimo, Dr E.T. Liwenga*

### *3.2.10 Enhancing the Measuring, Reporting and Verification (MRV) of Forests in Tanzania through the Application of Advanced Remote Sensing Techniques*

The goal of the MRV project is developing efficient methods for MRV utilizing a combination of ground data and remote sensing techniques to enable the Government of Tanzania to benefit from these techniques as part of their MRV system for REDD. Sokoine University of Agriculture (SUA) is collaborating with local and Norwegian partners in assisting the Government of Tanzania (GoT) to develop the MRV system. The University of Dar es Salaam through the Institute of Resource Assessment is one of SUA's partners in Tanzania in operationalising the MRV system Project duration April 2012 - March 2014

*Researchers: Dr. J.G. Lyimo, Ms Olipa Simon and Harun Makandi*

### *3.2.11 Transdisciplinary Training for Resource Efficiency and Climate Change Adaptation in Africa (TRECCAfrica)*

This is a five-year collaborative project between Stellenbosch, Universities of Dar es Salaam, Mekelle, Nigeria, Nairobi, Ghana, and University of Botswana, offering postgraduate scholarship at Masters and PhD level tenable at one of these Universities. At the University of Dar es Salaam the institutional project coordination is based at the Institute of Resource Assessment. TreccaAfrica (Transdisciplinary Training for Resource Efficiency and Climate Change Adaptation in Africa) provides doctoral and master's training to 80 postgraduate students in Africa at seven leading African Universities to provide the next generation of academics and professionals who will in turn be able to address an interlocking set of real challenges for Africa's future development: climate change and resource depletion. Africa's position in this complex requires unique, transdisciplinary skills and competencies. It is a continent dominated by poverty, contributes relatively little to total greenhouse gasses and in recent years has become the focus of a new global scramble for primary resources. It is generally accepted that Africa might well experience the most severe impacts of climate change and is the continent that is least prepared to handle these impacts. To be truly sustainable Africa will need to ensure that it uses its rich resource endowment responsibly to fund investments in human capacity and knowledge infrastructure that will sustain development after the primary resources have been depleted. This, in turn, will establish for Africa the kind of funding base needed to finance adaptations to climate change. The skills and competencies in transdisciplinary research methodologies that TRECCAfrica students will acquire and the research network that they will comprise will be able to generate policy-relevant research that tracks resource flows, prices, the use of these resources and flows of resource rents. Such a network will incorporate the various research environments from the partners involved into a sustainable partnership for climate change and resource efficiency, as co-supervision and staff mobility form part of the project. TRECCAfrica stated 2011, and is funded by European Commission under the Intra-ACP Academic Mobility Scheme.

*Coordinating Researchers: Prof. R.Y.M. Kangalawe, Dr. J.G. Lyimo, Dr N. Nyandwi, Dr S.H. Mkhanda, DPGS, and Directorate of International Relations*

### *3.2.12 Participatory Capacity Building for Climate Smart Farming Innovations through Action Research: The Case of Bahi, Iringa and Longido Districts*

This is an action research that took an advantage of experience by IRA working with small scale farmers in Tanzania and Malawi using same approach to address climatic related challenges affecting agricultural sector in Bahi, Iringa and Longido districts. The study involves testing and validating

different agricultural technologies ranging from tillage practices, cropping strategy i.e adaptable crops and varieties, cropping pattern, crop rotation, intercropping, access to fertilizer and improved seeds, security of land tenure and access to information about markets, crops storage facilities and reliable transport etc. The implemented actions were purely based on farmers demand based on experiential learning. Where and what to do was decided by themselves through interactive climate smart field schools on mother and daughter plots. The main objective of the project is to build capacity of small scale farmers for climate smart farming innovations using Climate Smart Field Schools (CSFS) in mother and daughter action learning plots. Specifically the project aims:

1. To identify and examine climate smart innovations adopted by farmers by contextual factors such as gender, wealth ranks, land tenure, land size, education, tribe, age, food security indices etc and based on other qualitative attributes,
2. To analyse challenges towards small scale farmers adoption of climate smart innovations and identify capacity building areas in terms of action research,
3. To train small scale farmers on climate smart farming innovations through interactive climate smart field schools in mother and daughter learning plots with due emphasis on marginalised groups such as women,
4. To scale 'Up' and 'Out' effective innovations from farm level to community level with due emphasis on marginalised groups such as women,
5. To link up with policy makers in order to integrate effective climate smart innovations and strategies into development plans and policies.

*Participating Researchers: Prof Amos Majule, Joseph Perfect, Dr. Lyimo, Mr. Madalla, Mr. Gwambene and Mr. Sixbert*

### *3.2.13 Status of Land Degradation in Tanzania*

The consequences of land degradation are numerous including reduced productivity, food insecurity associated with loss of soil fertility, loss of income and livelihoods, destruction of important ecosystems and loss of biodiversity. Given such situation the government has over the years implemented various projects including HADO, LAMP, SCAPA, HASHI and SLM Kilimanjaro but still land degradation problem is persisting, with some areas being severely degraded. This necessitates the need for holistic and participatory ways to address the drivers, pressures, state, impact and responses to land degradation. Understanding the dynamics of land degradation is important in the planning and implementation of sustainable land management interventions. However, there is limited reliable baseline information regarding the magnitude of the problem in the country. It is from this background that the establishment of current status of land degradation and main indicators in Tanzania has become a paramount undertaking.

The objective of the study was to establish baseline information and main indicators of land degradation in Tanzania from 1980 to date. This involved among others the following activities: establishment of land cover changes and land degradation baselines from 1980 to 2012, and establishment of land degradation status and identification of areas mainly affected by land degradation. The study also involved identification of main factors contributing to land degradation, indicators for land degradation, as well as identification of lessons learnt and best practices from various initiatives implemented to address land degradation in the country.

The study was conducted in the whole of Tanzania Mainland, which is estimated to cover an area of about 881,289 km<sup>2</sup>.

*Participating Researchers: Prof. Amos E. Majule, Prof. Richard Y.M. Kangalawe, Dr. James G. Lyimo, and Dr. Florian Silangwa*

### *3.2.14 Transformations in Poverty and Property Rights in Rural Tanzania*

The aim of this research project is to investigate the transformation of legal institutions overseeing property rights in Tanzania in order to gain a better understanding of its impact on poverty in the rural sector. This understanding will enable us to contribute to discussions about how to improve theories and conceptual tools for analyzing the dynamics of land rights and land conflicts in ethnically and legally plural settings. Moreover, the empirical evidence we gather will contribute to the formulation of improved policies and guidelines for the management of land rights and land conflicts in countries with legal pluralism and their incorporation into poverty alleviation strategies. The objective of the project are as follows:

- To examine and compare how groups and individuals define the nature of land rights, specifically with attention to how they articulate their claims over land, both before and after titling processes were introduced.
- To identify winners and losers in the formalization of land rights paying close attention to ethnic, gender, political, and social dimensions, including the impact on pastoralists and other indigenous groups.
- To identify the impact of titling on credit access, land investments, land productivity, land values, and land market activity, particularly as they affect the rural poor and their incomes.
- To identify the impact of titling on land disputes and their resolution. We also seek to identify the legal political and socio-economic factors that facilitate and/or constrain efforts towards better management of land conflicts.
- To identify the impact of titling on rural people's security of tenure and their perceptions of security of tenure.

Researchers: Prof. F. P. Maganga and colleagues from the University of Michigan

### *3.2.15 Valorizing Green Economy, Inclusive Growth and Employment.*

The project aims at accelerating green inclusive growth through new knowledge on institutional environments to allow transition to a green economy, and valorization of documented territory specific products, with a focus on honey products embodying pollination services from agro-ecosystems stewarded by smallholders, inspired by protected geographical indications.

Researchers: Prof. F. P. Maganga; Prof. A.G. Mwakaje and Dr. R. Lokina

### *3.2.16 3.1.16 Species status, genetic diversity and conservation implications of neglected and underutilized plants from arid and semi-arid regions of Tanzania*

This project contributes to a larger project entitled "Economic potentials, phytochemical evaluation and genetic characterization of some selected East and West African neglected and underutilized plant species". This is a collaborative research between Tanzania (IRA), Uganda and Nigeria. The objectives for the Tanzanian subproject are to: 1) identify the NUS in the study areas 2) determine which of the NUS are more frequently utilized by locals than others 3) determine the level of genetic variation within and between populations of some of the collected species 4) compare the level and patterns of genetic diversity between and within populations of the most widely and least utilized NUS species 5) assess whether discernable genetic groups exist within *Cleome gynandra* of Tanzania, Uganda and Nigeria.

Researchers: Dr Catherine Masao.

## 4 SECTION FOUR: PUBLICATIONS

A total of 25 publications were produced, including six books (and book manuscripts); one book chapter; eighteen journal articles; four research reports, three consultancy reports and three workshop proceedings, as indicated below.

### 4.1.1 Published Journal Articles

Lyimo, J.G., Ngana, J.O., Liwenga E., and Maganga, F. (2013). Climate change, impacts and adaptations in the coastal communities in Bagamoyo District, Tanzania. *Environmental Economics*, Vol. 4, Issue1, 2013.

Kangalawe, R.Y.M. and Lyimo, J.G. (2013). Climate change, adaptive strategies and rural livelihoods in semiarid Tanzania. *Natural Resources 4*: 266-278 [DOI:10.4236/nr.2013.43034]

Mwakaje, A.G., Manyasa, M., Wawire, N., Ongare, D., Muchai, M., Mugoya, C, Masiga, C.W. and Nikundiwe, A. (2013): Income Generation and Governance Challenges by Local Communities in Protected Areas: The Case of Serengeti Mara Ecosystem (SME). *Journal of Environment & Development* 22(1) 51–73.

Mwakaje, A.E.G., Yanda, P.Z., Mung'ong'o, C.G. and Kangalawe, R.Y.M. (2013). The cost of climate change on smallholder farmers adaptation and mitigation: the case of Kasulu district. *International Journal of Applied Agricultural Research* 8(1): 83-101

Kangalawe, R.Y.M. (2014). Nutrient budget analysis under smallholder farming systems and implications on agricultural sustainability in degraded environments of semiarid central Tanzania. *Journal of Soil Science and Environmental Management* 6(3): 44-60 [DOI:10.5897/JSSEM 13.0390]

Hamisi, H.I., Tumbo, M., Kalumanga, E. & Yanda, P.Z. (2012): Crisis in the wetlands: Combined stresses in a changing climate – Experience from Tanzania. *Climate and Development*. Available online: 27 Feb 2012 [DOI: 10.1080/17565529.2012.665009 ]

### 4.1.2 Journal Articles Submitted for Publication

Noe, C. and Kangalawe, R.Y.M. (2014). Wildlife protection, community participation and (dis)empowerment in southern Tanzania. Accepted by Conservation and Society journal.

Kangalawe, R.Y.M., Noe, C., Tungaraza, F.S.K., Naimani, G. and Mlele M. (2014). Understanding of traditional knowledge and indigenous institutions on sustainable land management in Kilimanjaro Region, Tanzania. Submitted to Open Journal of Soil Science.

## 4.2 Research Reports

Neil Bird, Helen Tilley, Nella Canales Trujillo, Godber Tumushabe, Bryn Welham, and Pius Yanda (2013): Measuring the effectiveness of public climate finance delivery at the national level; Overseas Development Institute, March 2013

## 4.3 Consultancy Reports

Faustin Maganga (2013). Towards responsive governance in climate change adaptation” Research. Project funded by University of Eastern Finland.

Kangalawe, R.Y. M. (2013). Establishment of baseline on the status of mainstreaming environment and climate change adaptation in key MDAs Sector Plans. Report submitted to the Vice President’s Office, Division of Environment (May–November 2013).

## 4.4 Conference Proceedings

Majule, A.E and Masao, Catherine (2014). The contemporary evolution of African Floodplains and Deltas. The African Deltas Conference 2014, held on the 27 to 30th May 2014 in Dar es Salaam, Tanzania.

## **5 SECTION FIVE: FINANCES**

### **5.1 Sources of Funds**

#### *5.1.1 Government Sources*

During the year 2013/2014, the Institute continued to receive a budgetary allocation from the Government through the University of Dar es Salaam to cover other charges, over and above personal emoluments.

#### *5.1.2 Own Sources*

The Institute continued to generate funds from internal sources. These came mainly from contracted research and community services rendered.

#### *5.1.3 Development Partners*

Some funds were obtained from Development Partners through various research and capacity building projects and programmes housed at the Institute.

## 6 APPENDICES

### List of Academic Members of Staff

- 1 **Amos E. Majule, Director, Associate Professor.** B.Sc. Agric. Hons (SUA), PhD (Reading). Environment, Soil Fertility and Conservation.
- 2 **Faustin P. Maganga, Associate Professor,** BA Hons; M.A. (Dar), MSc. (Zimbabwe), Ph.D. (Roskilde). Institutional Aspects of Natural Resource Management.
- 3 **Pius Z. Yanda, Professor,** B.Sc., Hons (Dar), Dip. MNRSA; MSc. (AUN), PhD (Stockholm). Environment, Water Resource Development
- 4 **Idris S. Kikula, Professor\*\*,** B.Sc. Hons.; MSc. (Dar) PhD (Griffith). Land Resource Management, Environment and Remote Sensing. (retired)
- 5 **Athanas S. Kauzeni, Professor,** Dip. Agric; Postgraduate Dip. Agric. Extension (Reading); BSc Agric.; MSc (West Virginia); PhD (Agricultural Extension) (Dar es Salaam).(Retired- on contract)
- 6 **Mark R. Mujwahuzi, Associate Professor,** B.A. Hons. (Dar), M.A, PhD (Clark), Postdoc. in Demography (Pennsylvania). Water Resource Management (Retired – on contract)
- 7 **Claude G.M. Mung'ong'o, Associate Professor,** Dip. Lib. (Makerere), B.A. Hons (Dar), M.A. (Dar), PhD. (Stockholm). Environmental Sociology.(Retired-on contract)
- 8 **Hussein Sosovele, Associate Prof.,** BA Hons; M.A. (Dar), Ph.D. (Bremen). Sociology
- 9 **Richard Y.M. Kangalawe, Associate Professor,** Dip. Crop Prod. (Uyole), B.Sc. Agric. (SUA), PGDIP. MNRSA, MSc. (AUN), PhD Physical Geography (Stockholm). Agriculture, Natural Resources Management, Land use, Environment.
- 10 **Agnes G. Mwakaje, Associate Professor ,** B.Sc. Agric.(SUA); MSc. Agric. Economics (Reading) PhD Agric. Economics (London), Agricultural economics.
- 11 **Hildegard L. Kiwasila, Lecturer,** BA Hons (Dar) M.P.H. (North Carolina) PGWSST (Loughborough) Sociology, Public Health.
- 12 **James G. Lyimo, Senior Lecturer,** B.Sc. Agric. (SUA), PGDIP. MNRSA, MSc. (AUN) Natural Resource Management, PhD Geography (Copenhagen), Natural resource management and Land use systems.
- 13 **Emma T. Liwenga, Senior Lecturer,** Dip. Crop Prod. (Uyole), B.Sc. Agric. (SUA), PGDIP. MNRSA, MSc. (AUN), PhD Human Geography (Stockholm). Agriculture, Natural Resources Management and food security issues.
- 14 **Simon Mwansasu\*, Assistant Lecturer,** Visual C++ Programming (QA, UK), B.Sc. Hons; MSc. (Pinar Del Rio, Cuba). Forest Engineering.
- 15 **Catherine A. Masao, Lecturer,** B.Sc. (Gen) UDSM, MSc. (Kent – Canterbury UK). Conservation Biology, PhD (Oslo, Norway / SUA)**Florian C. Silangwa, Lecturer,** Diploma Education (Korogwe), B. Educ. (UDSM), M.A. Demography (UDSM). Demography, PhD (Cologne, Germany).
- 16 **Emmanuel E. Hanai\*, Assistant Lecturer,** B.Sc. Env. Eng. (UCLAS), MSc. Env. Eng. UDSM.
- 17 **Joseph Perfect\*, Assistant Lecturer** BSc. Forestry (SUA), MSc. Dry-land biodiversity (Addis Ababa University).
- 18 **Noah Pauline\*, Assistant Lecturer,** B.Sc. Env. Mgt (SUA), MSc. Env. Science (UDSM).
- 19 **Victoria Moshy\*, Assistant Lecturer,** B.A. (Geog & Env. Studies) UDSM; M.A. (Geography & Env. Mangt) UDSM.
- 20 **Madaka Tumbo\*, Assistant Lecturer,** B.Sc. Env. Mgt (SUA), MSc. (NARAM) (UDSM).
- 21 **Yusuph Katundu\*, Assistant Lecturer,** B.Sc. Forestry (SUA), MSc. MNRSA (AUN).
- 22 **Elikana Kalumanga\*, Assistant Lecturer,** B.Sc. Wildlife Mgt (SUA), MSc. NARAM (UDSM).

#### Key:

\* On study leave

\*\* Appointed Vice Chancellor Dodoma University

### List of Technical Staff

1. **Stephen K. Kajula<sup>++</sup>, Chief Technician**, Cert. in Agro-meteorology-WMO (Nairobi Kenya); Cert. Photo Interpretation Land Use/Land Cover (ITC Netherlands); Cert. Laboratory Photographic Technician (PCL UK); Cert. In Image Data Processing (Copenhagen); Cert. Land Resource Management & Image Data Processing (Zimbabwe); Cert. Wildlife Management (Mweka).
2. **Anna Mushi, Cartographic Technician**, GIS (Trondheim, Norway), Diploma Cartography (Horsens Polytechnic, Denmark), B.Sc. Computer Science (UDSM).
3. **Evod B. Ulaya, Field Officer I**, Certificate in Rural Development Planning (IRDP Dodoma).
4. **Captain Patrick Kikwaya, Senior System Administrator II**, B.Sc. Hons - Electronic Science and Communication, (UDSM), M.Sc. Electronics Engineering and Information Technology (UDSM).
5. **Olipa Simon, Senior GIS Laboratory Scientist II**, B.Sc. Hons – Survey (UCLAS), MSc. Computer science (UDSM), Cert. Principles and Applications of GIS and Remote Sensing in Natural Resources Management (ITC Netherlands).
6. **Tunu Mndeme, GIS Laboratory Technician I**, Diploma in Computer.
7. **Julitha Ipopo, Senior GIS Laboratory Scientist III**, B.Sc Land Survey (UCLAS), MSc Geoinformatics (ITC Netherlands).

**Key: ++ On short term contracts.**

### List of Administrative Staff

1. **Oscar Sawuka, Senior Administrative Officer (SAO)**, B.Com (Hons) (UDSM), MBA (UB, Botswana), MSc (Frankfurt, Germany).
2. **Dunia Nassoro, Assistant Accountant**, B. Com (UDSM), MSc (Strathclyde , UK)
3. **Ms. Jane Mwamwenda, Senior Supplies Officer, CSP.**
4. **Neema William, Office Management Secretary III.**
5. **Belinda Msumba, Office Management Secretary II**
6. **Lucas Kolowa, Driver.**
7. **Musa Fulano, Principal Driver.**
8. **Pendo Machaku, Office Attendant.**