

UNIVERSITY OF DAR ES SALAAM



INSTITUTE OF RESOURCE ASSESSMENT



Annual Report

July 2004 – June 2005

The Vision

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

Our 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".

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ACRONYMS

AIACC – Assessment of Impact and Adaptation to Climate Change
CACO – Chief Academic Officer
CBD – Convention on Biological Diversity
CDR – Centre for Development Research
CLEHA – Climate – Environment and Human Dynamics in Africa
EAAIA – Eastern Africa Association for Impact Assessment
EAC – East African Community
EIA – Environmental Impact Assessment
GIS – Geographical Information System
HADO – Hifadhi Ardhi Dodoma (Land Conservation Project in Dodoma)
IDS – Institute of Development Studies
ILRI – International Livestock Research Institute
IRA – Institute of Resource Assessment
IUCN – International Union for Conservation and Natural Resources
IWSD – Institute of Water and Sanitation Development
KEA – Kondo Eroded Area
MALISATA – Man-Land Inter-relations
NBS – National Bureau of Statistics
NEMC – National Environment Management Council
NORAGRIC – Norwegian Agricultural University
NTNU – Norwegian University of Science and Technology
OPAC – Open Public Access Catalogue
RELMA – Regional Land Management Unit
SAREC – Swedish Agency for Research Cooperation
SASA – Sustainable Agriculture in Semi-Arid Areas
SEA – Strategic Environmental Assessment
SUA – Sokoine University of Agriculture
TANAPA – Tanzania National Parks
TANESCO – Tanzania National Electric Supply Company Ltd
TANRIC – Tanzania Natural Resources Information Centre
UCLAS – University Colleges of Lands and Architectural Studies
UDSM – University of Dar es Salaam
UNDP – United Nations Development Programme
VPO – Vice President’s Office
WARFSA – Water Research Fund for Southern Africa
WWF – World Wildlife Fund For Nature

BOARD OF DIRECTORS

The Board that started in 2002/03 has continued to provide guidance to IRA.

List of IRA Board Members (2002/03 – 2003/07)

1. **Prof. Raphael B.B. Mwalyosi**, Director/Chairman, Institute of Resource Assessment, University of Dar es salaam.
2. **Mr. Richard Muyungi**, Assistant Director, Division of Environment, VPO
3. **Mrs. Ester C.J. Kerario**, Director EIA/SEA, NEMC
4. **Mrs. A. Kaduma**, Director of National Food Security, Ministry of Agriculture and Food Security
5. **Mr. J.M. Mihayo**, Assistant Director, Water Resources Development, Ministry of Water and Livestock Development
6. **Dr. S.H. Sinda**, Institute of Development Studies (IDS) University of Dar es Salaam
7. **Prof. S. Misana**, Head, Geography Department, University of Dar es Salaam
8. **Dr. C.Z Kaaya**, Geology Department, University of Dar es Salaam
9. **Dr. J.L.M. Shitundu**, Economic Research Bureau, University of Dar es Salaam
10. **Prof. J. Nawe**, University Library Services, University of Dar es Salaam
11. **Mr. R. Musingi**, Regional Administration and Local Government, Dodoma
12. **Prof. IS. Iddi**, Director, Forest and Beekeeping, Ministry of Natural Resources and Tourism, Dar es Salaam
13. **Prof. J.O. Ngana**, Coordinator, Natural Resources and Environment, Institute of Resource Assessment, University of Dar es Salaam
14. **Dr. H. Sosovele**, Associate Director, Institute of Resource Assessment, University of Dar es Salaam
15. **Prof. I. Kikula**, UCLAS/IRA,
16. **Prof. N.F. Madulu**, Coordinator, Population and Human Settlement, Institute of Resource Assessment, University of Dar es Salaam
17. **Prof. P.Z. Yanda**, Coordinator, Information Technology and Remote Sensing, Institute of Resource Assessment, University of Dar es Salaam
18. **Dr. A. Majule**, Coordinator, Agriculture, Food Security and poverty Alleviation, Institute of Resource Assessment, University of Dar es Salaam
19. **Dr. F. Shechambo**, Coordinator, Social Policy Analysis, Institute of Resource Assessment, University of Dar es Salaam.
20. **Mrs. A. Hollella**, Representing the Supporting Staff, Institute of Resource Assessment, University of Dar es Salaam
21. **Mrs. E.G. Masha**, Administrative Officer/Secretary, Institute of Resource Assessment, University of Dar es Salaam

DIRECTOR'S FOREWORD



IRA Director Prof. Raphael B. B. Mwalyosi

As stated in the 2003/04 Annual Report, IRA believes that research must be guided, demand driven, and should be relevant to the existing socio-economic and political environment nationally and regionally. During the reporting period (July 2004 – June 2005), and following the launching of the new Research Agenda and Strategic Rolling plan, the Institute of Resource Assessment (IRA) continued to prepare a number of programmes as a way of implementing the Research Agenda and Strategic Rolling Plan. The IRA concentrated on the following activities:

- Preparation and finalization of a Research Programme;
- Preparation of a Master's Programme;
- Conducting Applied Research;
- Providing Community Services
- Teaching and Supervision of Postgraduates

Accordingly, IRA continued with the pioneering new project planning process whereby concept proposals are invited from IRA staff members based on the five thematic areas presented in the IRA Research Agenda namely:

- ❑ Natural Resources Management;
- ❑ Environment;
- ❑ Agriculture, Poverty Alleviation and Food Security;
- ❑ Population and Human Settlement;
- ❑ Social and Policy Analysis.

Substantial progress was made on the development and finalization of the new Natural Resources Assessment and Management Masters Programme initiated during the previous year. At the time of this reporting, the draft courses and modules including course outlines, course content, expected outputs, means of conducting courses and scheduled literature have been prepared and approved by higher University organs for use in 2005/06 academic year.

In the area of Research and provision of service to communities, the year 2004/05 was relatively productive. The Institute undertook and completed more than 9 applied research and service projects. Also, 20 applied research and service projects are on-going and spilled over into 2005/06. During the same time, staff members published 18 papers in international journals, 1 book, 10 chapters in books and 36 research reports, service reports and workshop proceedings. There was also increased demand for our GIS laboratory and EIA database services.

We wish our stakeholders fruitful readership and hope that in this small way we disseminate our research findings and expect constructive feedback for further improvement of our work. As we look forward to another fruitful 2005/06, we dedicate ourselves to putting more effort into research, community service and training.

SECTION ONE: OVERVIEW OF THE INSTITUTE (IRA)

1.1 Institutional Set-Up

The Institute's mandate remains as presented in the 2003/04 Annual Report as per its interim constitution that stipulates its establishment, administrative structure and staffing. The Director manages the Institute. He is an appointee of the University Council and reports to the Chief Academic Officer (CACO).

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

The Office of the Director is also equipped with "generic tools" i.e., two Associate Directors (for Academic and Administrative matters), Administrative Officer, and Accountant to help the Director with routine duties so that he focuses more sharply on strategic planning and management of the Institute instead of "administering" it.

Finally, the Director supervises 5 research team leaders or co-ordinators that also form the Management Committee. These are principal advisors to the Director and are responsible for planning and reviewing the institute's research activities. The Management Committee may also co-opt other staff when necessary and include a representative from the non-academic staff.

1.2 Management and Administration

1.2.1 Management committee

Name	Position
Prof. R.B.B. Mwalyosi	Director
Dr. H. Sosovele	Associate Director- Administration
Dr. F. Shechambo	Associate Director- Academic & Coordinator, Social & Policy Analysis
Prof. N.F. Madulu	Co-coordinator, Population and Human Settlements
Prof. J.O. Ngana	Coordinator, Natural Resources and Environment.
Dr. A. E. Majule	Coordinator, Agriculture, Food Security & Poverty Alleviation
Prof. P. Z. Yanda	Co-coordinator, Remote Sensing and Information Systems
Ms. E. Moshia	Administrative Officer/Recorder
Mr. C Msonganzila	Administrative staff

1.2.2 Staff matters

During the academic year 2004/2005 the number of staff members stood at 36 (18 academic, 8 technicians and 10 administrative staff). During the period a new technician Mr. Captain Patrick Kikwaya was recruited to the post of Systems Administrator.

Ms. Kiwasila visited and worked for 3 months with her supervisor at the University College, London where they agreed on the quality and content of her PhD Dissertation. Ms. Kiwasila has now submitted her PhD dissertation. On the other hand, Mr. James Lyimo continued to finalize his PhD Dissertation and was expected to officially defend his Dissertation in December 2005.

Dr. Faustin Maganga who was on a 1- year sabbatical leave to work with ECAPAPA in Entebe, Uganda reported back to work. Meanwhile Prof. Idris Kikula continued to work at UCLAS in his capacity as Principal of the College. Dr. Shechambo was appointed as Associate Director, to deal with academic issues following the start of Masters Programme.

Prof. Shishira retired in May, 2005 and was offered a two years contract.

1.3 Links and Collaboration

During the 2004/2005 period the Institute continued to establish links with local, regional and international Institutions. Continuing links include those with the School of Geography, University of Stockholm. The Center for Environment and

Development of the Norwegian University of Science and Technology (NTNU) through the Pangani Basin Programme; the Institute of Geography, University of Copenhagen, under the Sustainable Agriculture in Semi-Arid Areas – SASA programme.

Other collaborative research continued with the Center for Development Research (CDR), Denmark; Population Reference Bureau (USA) and; the Norwegian Agricultural University (NORAGRIC), Norway. Collaboration in research also continued with French University of Aix Marseille on research in Climate-Environment-Human Interactions in Africa.

Collaboration was either initiated or continued with several regional institutions including: the Institute of Water and Sanitation Development (IWSD); the Water Research Fund for Southern Africa (WARFSA); 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).

Within Tanzania, collaborative research also continued with the Institute of Development Studies, Economic Research Bureau, Constituent College of Engineering, and Faculty of Science of the University of Dar Es Salaam. Public service contacts were undertaken on a routine basis with government ministries such as Vice President's Office, Ministry of Natural Resources and Tourism, Ministry of Agriculture and Food Security, Ministry of Water and Livestock Development, and Ministry of Regional Administration and Local Government. Other partners in 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 international NGOs and development partners such as WWF, UNDP and USAID.

1.4 Development of Physical Infrastructure at the Institute

1.4.1 Library Services and Documentation Unit

In the year 2004/2005, the IRA Documentation Unit continued to provide reading materials to Institute staff, other university staff, graduate and undergraduate students. The Documentation Unit is now fully computerised. Over 150 paper/books have been catalogued and linked to the Main Library Computerized Open Public Access Catalogue (OPAC). That means a reader can access documents successfully from the Main Library web site.

Some individuals and Organizations continued to donate publications, books and journals to IRA Documentation Unit. Some of these Institutions include CIFOR;

IIED; Zed Books; FAO; UNDP; ILRI (International Livestock Research Institute) and Chr. Milchelsen Institute.

1.4.2 Computer and Related Facilities

The Institute continued to make efforts in procuring new computers to keep pace with advances in Information Technology. During the reporting period, the Institute purchased 7 computers, 2 printers and 1 digital copier. Thus, currently, the Institute has a total of 29 working computers (including 24 desktops and 5 laptops). There are more computers compared to the previous year.

The Institute has a total of 15 Printers ranging in paper size from A4 to A0. The printers include two large format printers (plotters) i.e. HP DesignJet 5000 ps and HP DesignJet 750 C Plus. In addition, there is an *HP 5500 LaserJet* Printer that produces high quality printouts in A3 size.

1.4.3 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 Internet services with the main University library. The IRA website is up and running providing information to our stakeholders.

1.4.4 Rehabilitation of the Conference Room and Classroom for Masters Students.

The Institute rehabilitated the conference room by improving the sitting capacity and beautifying the room for it to be more useful for meetings. Also, IRA invested heavily in the rehabilitation of the classroom and computer room for NARAM students. IRA met all the expenses for this work from own funds.

SECTION TWO: TRAINING AND TECHNICAL SERVICES

2.1 Short-Term Training

2.1.1 *Communicating Environmental Research to Policy Makers*

In collaboration with the Population Reference Bureau (USA), the IRA conducted a third international, two-week policy communication workshop for participants from all-over Africa and beyond. The objective of the workshop was to train participants how to maximize policy makers' and planners' use of research results that illustrate the interaction of population, health and environment variables. Specifically, participants were trained how to:

- Address problems that policy makers face with integrated research;
- Understand how research findings enter an influence the policy process;
- Develop a policy-level communication strategy and action plan;
- Prepare and present short policy documents such as policy memoranda and fact sheets;
- Create and deliver oral policy presentations using a computer-based power point and graphics programme styles.

Trainers from IRA: Dr. H. Sosovele; Prof. N. Madulu, Dr. A. Majule and Ms. H. Kivasila.

2.1.2 *Integrating Environment into the Poverty Reduction strategy process potential of SEA*

A workshop was organized as part of a study on Strategic Environment Assessment (SEA) and its potential for use in Tanzania and linkages to the Poverty Reduction Strategy process. The study was the initiative of the Vice President's Office and was supported by the UNDP.

The objectives of the workshop were:

- To increase awareness on SEA as a planning tool and a means of integrating environment issues into the planning and policy process;
- For the consultants undertaking the study to present on their initial work and plans; and,
- To explore with stakeholders on the potential application of SEA, or its principles, in Tanzania.

Participants from 41 key sectors and government institutions attended the workshop.

Four presentations were made in the workshop:

- Strategic Assessment and Environmental Impact Assessment: Linkages in Tanzania for Development and Environmental Conservation;
- Strategic Environmental Assessment in District Planning for Sustainable Development;
- What is SEA?; Overview of the Principles and Examples;
- Overview of the relationship between poverty and environment

Trainer: Prof. R.B.B. Mwalyosi; Prof. I. Kikula; Dr. H. Sosovele and Dr. A. Amkenda

2.2 Teaching and Supervision

During the year under review, members of academic staff participated in the following activities that are related to teaching and supervision.

1. Prof. N Madulu is a co-supervisor of Mr. Haule, Michael J. doing his PhD - Population Dynamics and Sustainable Catchment Forest Conservation: A Case Study of Matogoro and Litenga Catchment Forests in Songea District in Tanzania, University of Kwazulu Natal, School of Development Studies.
1. Prof. I. Kikula: supervised Mr. Ndangarasi of Botany Department in his PhD studies; supervised dissertations of undergraduate students in URP at UCLAS; and; was external examiner at NTNU, Norway
2. Prof. R. Mwalyosi supervised Mr. Mcharo of NEMC in his PhD studies and taught EV619 (Environmental Impact Assessment) to MSc. Students of the faculty of Science.
3. Dr. C. Mung'ong'o participated in the teaching and supervision of M.A. Course (GE618), Management and Conservation of Environmental Resources at the Department of Geography, UDSM
4. Dr. A. Mwakaje taught GE 211 (Agricultural Planning and policies).
5. Prof. R. Mwalyosi Prof. R. Mwalyosi taught EIA course to MSc. Students of the Dryland Biodiversity Programme at the University of Addis Ababa, Ethiopia.
6. Dr. R. Kangalawe was external examiner for two M.Sc. students from the Department of Forest Economics, Sokoine University of Agriculture.
7. Prof. Madulu: supervised Karin Lindsten , a Masters student from the University Lund, Sweden; supervised Haule, Michael J., PhD student, University of Kwazulu Natal, South Africa and; supervised Mwakajonga, Tuntufye A., a Masters student, Demographic Training Unit, University of Dar es Salaam.
8. Prof. P. Yanda: supervised Mr. A. Lyimo of IRA who has just completed his MSc. Studies and; supervised Mr. C. S. Sokile who has already submitted his PhD Thesis.

2.3 Preparation of Teaching Programmes and Curricular

During the year under review, members of staff continued working on various aspects of the Masters Degree Programme named ***Resource Assessment and Management (NARAM)***. At the time of this reporting, the draft courses and modules had been prepared and approved by the higher authorities at the University of Dar es Salaam. Advertisements and information to the public has also been issued. The course will start this 2005/06 academic year.

SECTION THREE: RESEARCH AND COMMUNITY SERVICES

3.1 Completed Research and Community Services

3.1.1 An analysis of land use dynamics and land degradation processes in the Great Rift Valley, central Tanzania: A case of Iramba District.

The research project has been completed. The project started in June 2003 and was funded by OSSREA. The final report has been submitted to OSSREA. This study investigated the land-use dynamics and land degradation processes in the Great Rift Valley areas of Iramba District, Tanzania. The main objective of the study was to investigate land-use dynamics, agricultural development and constraints and their socio-economic and environmental effects in the Kinampanda-Kinyangiri landscape in Iramba District. Four villages were included in the study, including two in the rift valley and two in the plateau. The study employed two methodological approaches, including participatory assessments and quantitative (household interviews and soil analysis) to obtain qualitative and quantitative information pertaining to biophysical, agronomic and socio-economic facts that influence community access to, and utilisation of the various resources, and on the dynamics of land-use and land degradation.

Results indicate that over the last few decades the land-use intensity has increased for agriculture, including crop cultivation and livestock keeping and other livelihood activities. The increase has been due to increasing population of both people and livestock, and hence the resultant needs to produce more food. However, there are environmental concerns associated with increasing land-use intensity, including deforestation, soil erosion, declining soil fertility and trampling of soils by increasing livestock numbers. The main conclusion is that to sustain livelihoods under the ongoing dynamics in the study area there is need for an integrated approach in managing different resources available. Various measures need to be undertaken to ensure environmentally sound agricultural practices including raising farmers' awareness of the need to incorporate appropriate land and water conservation measures in managing their farms, as well as in addressing constraints in the various sectors such as agriculture, natural vegetation use and water resources. This requires an integrated approach in managing different resources. This could be facilitated by developing elaborate village land-use plans that could show the distribution of the various parcels of land and how each parcel could be utilised best. Economic disincentives such as lack of reliable and sustainable markets for different crops and poor provisioning of agricultural inputs are the major causes of poor and low agricultural production in the area, and hence to livelihood insecurity. Increasing agricultural productivity would be necessary to also ensure environmental sustainability. Among the long-term measures to be undertaken against the present absolute dependence on agriculture as the major livelihood

activity should be by promoting alternative off-farm activities such as small-scale industries.

Output from this research project has been published in a book: "Kangalawe, R.Y.M., Majule, A.E. and Shishira, E.K. (2005). Land-use dynamics and land degradation in Iramba District, central Tanzania. Organisation for Social Science Research in Eastern and Southern Africa, Addis Ababa, (ISBN 1 9048855 62 8)".

Researchers: Dr. R.Y.M. Kangalawe, Dr. A.E. Majule and Prof. E.K. Shishira

3.1.2. Capacity Building to Evaluate and Adapt to Climate Change-Induced Vulnerability to Malaria and Cholera in the Lake Victoria Region

This research project has been completed during the reporting period. It was funded by Assessment of Impact and Adaptation to Climate Change (AIACC) Programme, and was jointly undertaken by the Institute of Resource Assessment, University of Dar es Salaam, University of Nairobi (Kenya) and University of Makerere (Uganda). This research project had five objectives:

- To analyse climate variability in temperature and rainfall extremes in relation to reported and documented malaria and cholera outbreaks in order to establish the coupling sensitivities and critical climate thresholds;
- To determine patterns of water supply, use and management in relation to malaria and cholera outbreaks of targeted groups
- To determine socio-economic profiles and activities of the target groups as factors that influence their vulnerability and adaptation strategies
- To carry out climate sensitivity tests for prediction of possible and future vulnerabilities and coping ranges
- To build capacity of institutions and scientists in the region to conduct climate variability and changes, vulnerability and adaptation research.

The project activities undertaken during the reporting period included: analyses of socio-economic data and modeling to generate the relationships between climate change, household characteristics and incidences of malaria and cholera. In Tanzania the study was undertaken in Bugarama village (Muleba District) for analysis of climate change-induced malaria, and in Chato Village (Biharamulo District) for cholera. Among the lessons learned is that villagers in the study areas are quite familiar with malaria as a serious disease particularly in Bugarama village. As a result, they have developed a number of locally adapted control measures such as use of traditional herbs. Such adaptation does not exist for cholera for the reason that it is considered to be a new disease and herbalists have not been able to identify appropriate medication. Findings from this study provide an understanding on the vulnerability, magnitude of impacts, locally derived adaptation strategies, and identify areas for external intervention measures and adaptation scenarios. During the period also a final report was

been produced and submitted to AIACC. Four papers have also been prepared and submitted for publication in international journals (currently at various stages of review); and one working paper has been published by AIACC.

Researchers: Prof. P.Z. Yanda, Dr. R.Y.M. Kangalawe

3.1.3 Gender and Socio-Economic Study for the Bagamoyo District Council Strategic Urban Planning Framework (SUDPF)

The Gender and Socio-economic study was initiated by the Bagamoyo District Town and a consulting firm called WSP International Sweden AB. The Bagamoyo Historical Town SUDPF as an urban sustainable planning tool is a SIDA funded project. The IRA was contracted to collect through quantitative and qualitative participatory methodologies data on livelihood strategies, problems and needs and how those needs can be addressed within the SUDPF process and the present status of Bagamoyo town as a World Heritage Site. IRA was also required to give recommendations to the SUDPF Steering Committee, on appropriate and effective approaches for targeting the SUDPF participation process and for gender mainstreaming. The results of the study were presented to the Bagamoyo SUDPF Steering Committee and to the WSP and the District Council.

A representative sample of 409 households, 78 micro enterprises, 14 community-based organizations and Non-Governmental Organizations (CBO/NGOs) and 20 mobile vendors was interviewed using questionnaires and checklists. PRA meetings were held at sub-village level in 31 sub-villages in four villages namely Magomeni, Makurunge, Dunda and Kaole in Bagamoyo Township area.

Summary of Key findings:

- During the initial planning stage of the Bagamoyo SUDPF (2000-2003) different stakeholders and key issues to be dealt with by SUDPF were identified and project formulation was done by technocrats at the SUDPF office assisted by UCLAS. However, the projects did not put much effort in involving residents in planning. Their needs and expectations especially of the poor were not addressed. Only 8 people (2%) out of 409 household respondents really knew what SUDPF as a community participatory urban plan was. Most of these who were aware of SUDPF were either members of the SUDPF working groups or their relatives. Lack of involvement was the source of dissatisfaction with SUDPF operations.
- Villagers had a number of expectations that cut across and go beyond the land planning and conservation needs of the District Council and the Nation on the Bagamoyo town as a 'World Heritage Town'. Apart from wanting assurance of their stay in the town, they want to be allocated surveyed plots,

to have democratic governance at the District Council level i.e. to be involved in decision making regarding allocation of land for various uses as there was increasing eviction of locals residents in favour of investors from outside the area.

- The Bagamoyo Town was riddled with land conflicts, pickpockets, drug users, alcoholism, prostitution and HIV/AIDS instigated by poverty caused by many factors including corrupt land officers who were marginalizing local resident farmers and fishermen through land alienation. Also, hotel investors were blocking access of local fishermen to the sea. Coconuts and cashew nuts which were once dependable income earning crops, were not yielding much due to fungal infestation and the effects of the rhino beetle on coconut trees. There was also degradation of mangroves by people from Zanzibar who were making charcoal in Bagamoyo from mangroves trees for use in Zanzibar; fish catches have dwindled due to foreign and local fishing vessels (trawlers) fishing in shallow waters impacting negatively on poorly equipped local fishermen.
- Low education of local residents especially the youth doesn't afford them to secure jobs in the present growing commercial sector. While the indigenous suffer from unemployment, poverty, lack of adequate social services; investors were importing own relatives and outside labourers even in shop floor jobs that needed no education.

Villager's expectations

The expectations included to have the above problems solved and: to secure employment especially for youths and other able bodied men and women; improved socio-economic infrastructure; stone buildings rehabilitated; skill training for youths, fishing modernized and fishermen given soft loans; irrigation farming in Ruvu area expanded, rain fed farming supported with tractors to lessen the workload to the elderly most of whom are the ones farming. Wet land areas within the town boundary should not be allocated for housing plots but left for farming; Petty traders be given support with credit facilities for self-employment and poverty alleviation; instrumental support be given to the vulnerable i.e. orphans, disabled and the elderly who lack families and support; the town to be well planned and beautified, to be left to own and control historical sites (Kaole graves) and to benefit from tourism.

Recommendations

The study recommended that the District Council should change the existing SUDP structure and include a multi-sectoral technical team to implement SUDP activities as the present district council staff is unavailable due to many commitments. The present SUDPF working groups (composed of ordinary people as stakeholders) have no mandate to function as local/central government technocrats to undertake land surveying and other activities. Each sector

implementing SUDPF activities should have an expatriate adviser. The implementation team should be well equipped, funded and guided by a plan of operation (POP). The present SUDPF project has to be re-planned, the budget revisited, community mobilization and participation to be redone and for this purpose, an extension period of 2 years for preparatory work be requested from the donor-SIDA. Despite the problems highlighted above, about 56% of the 409 respondents and the CBO/NGO and others interviewed were willing to participate in SUDPF activities and were positive that if involved the plan will succeed. The District the SUDPF Steering Committee was advised to exploit the opportunity wisely through democratic procedures.

Researchers: H Kiwasila

3.1.4 Risk Perception, Land Use and Labor Migration in Northern Tanzania

This research exploratory study designed to examine and characterize local assessment of risks and evaluate how perceptions of risk are changing overtime. The study aimed to identify the risks people associate with alternative livelihood strategies as they affect household economics, health and labor migration; and gauge the perceived severity of hazards and what determines these assessments at the household level. The study was in 4 villages located in Simanjiro and Kiteto Districts in Manyara Region. This work is done in collaboration with Carolina Population Center, University of North Carolina (September 2004-January 2005).

Researcher: Prof. N Madulu and H Kiwasila

3.1.5 Water Resources Management, Pangani River Basin

The main objective of the study is to establish sustainable water resources management in the basin contributing to improved livelihoods without compromising the ecological integrity.

Specific objectives include:

- To establish data base on water availability, trends and competing uses
- To establish factors contributing to water use namely; key stakeholders, population dynamics, land use patterns and change
- To provide conflict management strategies among competing uses
- To enhance research capacity of the staff and students of University of Dar es Salaam

Major findings include:

- Situation analyses indicate that water availability varies spatially with rainfall patterns indicating relatively higher water surplus in the highlands of Kilimanjaro and deficits in the lowlands stretching to the semi arid Masai plains.
 - Population increase is quite high in the highlands resulting in high water consumption both in domestic and irrigation.
 - Weak land use practices especially in the highlands lead into soil erosion and flash floods and high sedimentation in rivers with low base flows. The latter imply low dry season flows resulting into frequent conflicts between sectors and between upstream and downstream users.
 - Some coping strategies include out migration from highlands to the lowlands increasing further the stresses on the limited water.
 - Water users associations which are slowly gaining popularity provide useful dialogue forums for resolving conflicts.
- Similarly, the informal or traditional institutions provide a useful vehicle for resolving conflicts at local levels.

Key recommendations include:

- Enforcement of laws and bylaws on environmental conservation, good land use practices
- Enhancement of stakeholder participation through education and awareness creation on water policy, roles of each player and mechanisms for financing the water sector
- Need for capacity building in the water resources management
- Need for continuous collection and maintenance of data base and information
- Need for climate change studies on Mt. Kilimanjaro
- Need for tracer studies on recharge areas of springs around Mt. Kilimanjaro.

Researcher: Prof. J Ngana

3.1.6 Capacity Building to Evaluate and Adapt to Climate Change-Induced Vulnerability to Malaria and Cholera in the Lake Victoria Region

This research project had five objectives:

- To analyse climate variability in temperature and rainfall extremes in relation to reported and documented malaria and cholera outbreaks in order to establish the coupling sensitivities and critical climate thresholds;
- To determine patterns of water supply, use and management in relation to malaria and cholera outbreaks of targeted groups

- To determine socio-economic profiles and activities of the target groups as factors that influence their vulnerability and adaptation strategies
- To carry out climate sensitivity tests for prediction of possible and future vulnerabilities and coping ranges
- To build capacity of institutions and scientists in the region to conduct climate variability and changes, vulnerability and adaptation research.

The project was funded by Assessment of Impact and Adaptation to Climate Change (AIACC) Programme and is worth US\$ 200,000. The IRA- University of Dar es Salaam, University of Nairobi (Kenya) and University of Makerere (Uganda) jointly undertake the project.

One paper has been accepted for publication and three other papers have been submitted.

Researchers: Prof. P. Yanda, Dr. R. Kangalawe

3.1.7 Establishment of Tarangire Information Centre (TIC)

The project was initially funded by WWF for 2 years and thereafter funded by TANAPA for one more year. The TIC was handed over to TANAPA March this year. The Centre has datasets with basic information on the Tarangire/Manyara ecosystem. This includes, but not limited to road network, settlements, administrative boundaries, ranger posts, tourist facilities, etc. The datasets have been obtained from various sources including TAWIRI that has provided animal count census data.

IRA Researchers: Prof. P. Yanda and Mr. S. Mwansasu

3.1.8 Wetland Utilization, Poverty Alleviation and Environmental Conservation in Semi-Arid Areas of Tanzania – The case of Dodoma and Singida Regions

This is a research project supported by REPOA. The majority of people in Rural areas depend on natural resources such as forest products, land for agriculture and water for various uses for their livelihoods. Agriculture provides them with food and cash. Poverty alleviation strategies for rural communities in Sub-Saharan Africa depend more on natural resources. In semi-arid areas wetlands provide a range of livelihoods as compared to dry land areas. This study therefore aimed at exploring on the following;

- How do wetland utilizations contribute to poverty reduction?
- Which wetland utilizations enhance food security and reduce poverty levels without compromising ecological integrity of the wetland?
- Which wetlands utilizations enhance food security and reduce poverty levels but contribute to the degradation of the wetland?

- How wetlands can be sustainably managed while supporting livelihoods of the local communities?
- How are the conflicts over the use of wetlands (particularly between crop cultivators and livestock keepers) being resolved and how can these mechanisms be improved?

Final report has been submitted and an extract from the report has been published as a chapter in the conference proceedings.

Researchers: Prof. P.Z. Yanda, Dr. A. E. Majule, and Dr. A.G. Mwakaje

3.1.9 Mapping of Selected Catchment Forests in Tanzania

This is a consultancy project to map the status of 13 catchment forests using high-resolution images. In this case, Quickbird was considered to be the most appropriate. In areas where such images could not easily be obtained because of cloud cover, SPOT images were used to fill the gap. Comments from the submitted reports have been worked. Final report and maps will soon be submitted to the client.

Researchers: Prof. Yanda, Prof. E.K. Shishira, and Mr. S. Mwansasu

3.2 Ongoing Research and Consultancy

3.2.1 . Systems Research on Small Groundwater Retaining Structures under Local Management in Arid Areas of East Africa (REAL)

This research project is being undertaken by a consortium of research institutes with funding from the European Union (EU). The main focus of the research is to explore ways and options of community participation in land and water management, taking small groundwater retaining structures as a case in point. The main emphasis is placed on the role of community participation in East Africa in planning, construction and management and evaluation of the performance of the groundwater retaining structures for humans, wildlife and livestock. It should be noted that this research project comes at a time when most Sub-Saharan Africa is experiencing recurrent drought or sometimes too much rain, which simply percolates underground, or flows all the way to the sea and disappears there, leaving behind people who face and have to cope with the after-effects of too much rain and later drought or shortage of water.

The project is undertaken jointly with the University of Dar es Salaam (Institute of Resource Assessment and Faculty of Engineering); Technical University of Delft - the Netherlands; Catholic University of Leuven, and University of Nairobi. The project involves local communities (livestock keepers and wildlife managers) in the Kitenden area, Arusha (Tanzania), and Amboseli National Park (Kenya).

Researchers: Dr. Sosovele, Prof. Shishira, Dr. Kangalawe and Prof. D. Mashauri (of Engineering Dept).

3.2.2 The dynamics of farming systems, food security and poverty alleviation strategies in the semiarid areas of Sukumaland, Tanzania

The research project started in June 2004 and is approaching completion. The study is funded by REPOA. Fieldwork for this study has been completed and the draft final report has been prepared and submitted to REPOA. The main objective of this study is to investigate the dynamics of the farming systems in Sukumaland. The study further examines the food security situation and poverty alleviation strategies that are carried out by local communities under changing environments, with specific reference to the impact of livelihood activities on land degradation and the environment in general. The study has been undertaken in Geita and Misungwi in Mwanza Region and Kahama and Kishapu in Shinyanga Region. In addition to agricultural and other livelihoods activities, Geita and Kahama represent areas with small-scale gold mining whereas Misungwi and Kishapu represent areas involved with small-scale diamond mining. In each of the two districts, two villages were selected in consultation with the respective districts authorities. Villages selected were Nyarugusu in Geita District, Mabuki in Misungwi District, Ilogi in Kahama District and Songwa in Kishapu District. At the villages detailed data collection was undertaken through discussions with key informants, participatory rural appraisals (PRAs), household interviews and field observations.

Findings indicate that the village communities are differentiated in various socio-economic groups namely the wealthy, the moderately wealthy and the poor, and majority of the people belong to the "poor" group. The village communities have different economic capacities, different food security situation and different poverty alleviation strategies. Majority of the people depend on agriculture (both crop production and livestock keeping) for their livelihoods, though other activities such as small-scale mining and business contribute to the food security situation and to alleviate poverty. Small-scale mining has been reported to have mushroomed only since the early 1990s, which is ascribed to have resulted in many people from other places migrating into the study areas. The study has established also that there are intergenerational differences in terms of activities undertaken by various age groups, including the strategies used to achieve food security and alleviate poverty. While the youths are more involved in business and small-scale mining activities the middle age and the elderly are more involved in agriculture as the main means of livelihood, ensuring food security and alleviating poverty. However land for agriculture is increasingly becoming scarcer due to increasing population and the expanding mining activities that have converted much of the arable land into badlands that cannot be cultivated.

Researchers: Dr R.Y.M. Kangalawe, Dr E.T. Liwenga, Dr A.E. Majule

and Prof. N.F. Madulu.

3.2.3 Livelihood Diversification and Changing Land Use Patterns in the Lake Victoria basin: An Assessment of Causes and Implications to Local Communities

This project started in November 2004 and is funded by VICRES. This study is being jointly by researchers from the Institute of Resource Assessment, University of Dar es Salaam, (TANZANIA); School of Public Health and Community Development, Maseno University (KENYA); and Department of Sociology, Makerere University (UGANDA). The overall objective of the study is to examine the extent to which changing socio-economic and environmental conditions contribute to livelihoods and poverty reduction initiatives and the environmental conservation efforts in the Lake Victoria Basin. The study intends to address the linkages between population pressure, livelihood strategies and impact on land use and environmental degradation. The study addresses these linkages by also focusing on food security issues and poverty alleviation strategies of local communities in the Lake Victoria Basin. The study is being carried out in three phases, each phase per year. Phase One of the study involves collection of background information of the study sites and establishing and documenting the causes of livelihood diversification and the current patterns/trends with particular focus on poverty alleviation strategies. The study is being undertaken in two agro-ecological zones in the Lake Victoria Basin in each of the participating countries (i.e. Tanzania, Kenya and Uganda). In each country, one case study represents the highlands above 1,500m above sea level; and another one in the lowlands i.e. areas close to the lakeshore with altitude less than 1,500m above sea level. In Tanzania the study sites are located in Tarime District in Mara Region. The two study villages are Mogabiri Village representing the highlands; and Kibuyi Village representing the lowlands. In Kenya the study sites are located in Vihiga District, whereas in Uganda, the study sites are located in Wakisu District. The preliminary findings indicate that the areas around Lake Victoria have an increasing pattern of population. Tarime District, for instance has the largest population in Mara Region i.e. increasing over years. This is reflected in the population density. The highland ecological zone is characterized by high population density of about 295 people per square kilometre whereas; the lowland areas have moderate population density of about 109 people per square kilometre.

Preliminary findings indicate that with regard to food security there is a close inter-linkages between communities living in the highlands and in the lowlands due to differences in the types of commodities available in the two agroecological zones. The market places in the lowland areas always appeared to sell commodities produced in the highland areas whereas; fishes are being sold in the lowlands as well as highland areas. The poverty alleviation strategies appeared to vary based on wealth groups. The findings show that the poor group has a limited number of strategies employed in poverty alleviation. The

diversity of livelihood strategies seems to increase with increasing wealth status; this could probably be due to flexibility in terms of how the available resources can be allocated and utilized. The findings further show that the youth appear to have more diverse strategies than both the middle aged and elderly people. These aspects will be further investigated and confirmed in the remaining phases of the project.

Researchers: Dr E.T. Liwenga, Dr R.Y.M. Kangalawe, and Prof. N.F. Madulu.

3.2.4 Coordination for the Policy Implementation Programme

This is an ongoing consultancy programme whereby WWF Tanzania Programme Office has commissioned IRA to provide technical input in the form of coordination for the implementation of USAID's US\$ 2.4 Million funded programme to support the Government of Tanzania implement the Wildlife Policy and the National Environmental Policy. IRA is providing coordination services in overseeing the implementation of the work plan.

This assignment is critical for IRA as it provides opportunity not only to contribute to the practical implementation of the policies but also, as another opportunity to IRA to foster linkages between the Institute and the key

Government departments, the donors and international NGOs. The programme is continuing through to August 2005. Some of the outcomes of this programme include the Environmental Management Act (EMA) of 2004 and Regulations for EIA passed in 2005. Others include formulation of Wildlife Management Areas in Tanzania.

Researcher: Dr. H. Sosovele

3.2.5 Socio-Economic Aspects of Traditional Canals in Mwanza District

This research is funded by WARFSA. The main objective is to analyse the historical socio-economic context of traditional irrigation system in Mwanza District with a view of establishing the underlying causes of its decline. The study also aimed to analyse the government's and donor's efforts to revive the traditional irrigation system, and establish the reasons why they did or did not succeed. The study was conducted in Mwanza District.

Researchers: Prof. N Madulu, ith Prof. D. Mashauri and Dr. Mvungi.

3.2.6 Rural-urban dynamics in a globalizing world: Changing livelihoods and settlement patterns in frontier regions of Africa and Asia

This research programme is funded by DANIDA and implemented jointly by the Institute of Geography, University of Copenhagen. Other participating countries are Vietnam, Thailand, Ghana and Tanzania. The overall objectives of the research programme is to examine the implications of changing rural-urban dynamics on livelihoods paying special attention to emerging mobility patterns and settlement characteristics and how these impact on poverty reduction and local economic development. Phase 1 and Phase 2 data collection has been completed. Data processing and analysis is in progress.

Researcher: Prof. N Madulu

3.2.7 Development of Sustainable Natural Resources Management Plan in the South Pare Mountain Ecosystem-The case of Hingilili catchment in the South Pare Northern Tanzania,

The objective of the research is to establish sustainable management plan for the Hingilili basin in the South Pare Northern Tanzania in order to contribute towards the restoration of ecological integrity and subsequently contribute to the improvement of rural livelihood and poverty alleviation.

The study considers Hingilili basin as a case study to draw lessons which could be used in similar environments in South Pare Mountain ecosystem.

Researcher: Prof. J Ngana

3.2.8 The Changing Livelihoods in the Maasai Plains – Implications on Poverty Levels and Sustainability of Natural Resource Base

This study is funded by REPOA. Two fieldworks have been conducted and progress reports were submitted and presented to the Annual REPOA Workshop. Objectives of this study are the following;

- Identify responsive mechanisms as a strategy to alleviate poverty and improve the standard of living in the study area,
- Examine whether such livelihood strategies have helped alleviate poverty in the study area,
- Examine the evolution of the poverty alleviation strategies in relation to dwindling natural capital in the study area,
- Propose tenable poverty alleviation strategies as the basis for achieving improved standard of living and sustainable use of the natural capital.

Comments on the draft final report submitted have been received and are being incorporated accordingly.

Researchers: Prof. P. Yanda and Mr. C.M.P. William

3.2.9 Poverty Levels and Community Vulnerability to Flooding in Kyela District, Mbeya Region, Tanzania

There is increasing observational evidence that regional changes in climate have contributed to various changes in physical and biological systems in many parts of the world. Physical and biological changes include change in rainfall frequency and intensity, shifts in the growing season, early flowering of trees and emergency of insects, and shifts in the distribution ranges of plants and animals in response to changes in climatic conditions. The sign and magnitude of climatic impacts varies across the geographical regions. In this case are the flooding episodes in the Lower Basin of the Songwe River a result of climate change or climate variability in the upper reaches of the Songwe River Catchment? Apart from the physical mentioned above, what biological changes are associated with these floods in the area? What type of health hazards are associated with these floods?

It is widely acknowledged that developing countries suffer most from the negative impacts of climate change, because of the economic importance of climate-sensitive sectors such as agriculture and fisheries, and limited human, institutional, and financial capacity to anticipate and respond to the direct and indirect effects of climate change (IPCC, 2001b). In the case of Kyela, how have the local communities adapted themselves to flooding? Have all social groups within the affected area adopted similar adaptation strategies? If not why? Are poverty levels a significant factor in ability to cope with flooding in these communities?

The objectives of this study will be as follows:

- To ascertain impacts of drought and/or floods on the affected communities;
- To identify and document coping mechanisms/strategies to floods adopted by different social groups at the household and community levels; and
- Develop and suggest ways to enhance the existing coping mechanisms/strategies in order to improve the effectiveness of poverty alleviation efforts.

Fieldwork was conducted in March 2005. Questionnaires have been coded and analysed. Draft research report has been prepared and submitted to the Directorate of Research and Publication, University of Dar Es Salaam. The report is presently being re-written into a journal paper. The University of Dar Es Salaam (SIDA/SAREC) funded the study.

Researchers: Prof. P. Yanda and Dr. C. Mung'ong'o

3.2.10 Assessment and monitoring of seismic and associated risks in the areas surrounding the Rungwe Volcanic Province, southern Tanzania

The study is proposed to assess and monitor the risk of seismic and other risks associated with volcanic eruption in the Rungwe Volcanic Province. The study is targeting to use geophysical, geological and geochemical methods to synthesise the magma reservoir in Rungwe and eventually use seismic monitoring, ground movement control and thermal emanation monitoring to be able to predict future volcanic related activities in the area. Specific objectives are;

- To map out areas that are likely to be affected in case of a volcanic event
- To document destructive forces that would take place in the immediate surroundings of the Rungwe Volcanic Province.
- To establish the probabilities of a volcanic event in a given time period
- To predict the possibility of loss (life, property, economy, etc.) due to a volcanism-associated hazard

Researchers: Prof E. I. Mbede, Prof. M. Maboko, Prof. P. Yanda, Dr. Isaack Marobhe, Dr. R. W. Ferdinand, and Mr. Ayubu Mbegha

3.2.11 Verification of FBD Forest Reserves

This study is part of the major study on valuation and registration of fixed assets for Forestry and Beekeeping Division. Verification of FBD Forest Reserves entails assessment of the current status of forest reserves and establish changes in forest reserve areas and vegetation cover using 1995 and 2003/4 satellite images. First fieldwork has already been conducted and second fieldwork has just commenced.

Researchers: Prof. P.Z. Yanda, Prof. E.K. Shishira, and Mr. S.L. Mwansasu

3.2.12 Natural Resources and Socio-Economic Baseline Survey for the Songwe River Trans-boundary Catchment Management Project

The objective of this study was to undertake scoping of the proposed project to determine natural resource use patterns, identify associated environmental and socio-economic threats to the catchment and propose intervention measures within the Songwe catchment.

Key findings from this study are;

- Soil erosion is well pronounced in some areas due to deforestation and cultivation on steep slopes.
- The area along Songwe in Mwaumbia, Tanzania, is overstocked, thus leading to soil erosion along cattle routes.

- Mono-cropping cultivation of seasonal crops such as maize, tobacco and beans is predominant. This is less effective in terms of soil and water conservation.
- The upper reaches of Songwe River are typified by presence of adverse slope conditions.
- Most forest reserves are under inadequate management because of inadequate financial and human resources.
- Shifting cultivation (e.g. Chitemene system) contributes to deforestation in the middle and upper catchment, thus subjecting soil to water erosion.
- Bush fires associated with charcoal burning and hunting of game meat, reduce protective vegetation cover and biodiversity.
- Charcoal burning, brick burning and fuel wood collection contribute to deforestation.
- Inappropriate fishing methods, such as complete blocking of the river with traps and nets at the mouth of the river and also the use of seine nets, lead to the destruction of breeding grounds and consequently diminished fish stock.
- The ongoing degradation of water sources in the middle catchment will change the hydrological regime of the river.
- There is lack of information on the current status of these resources

Researchers: Prof. R.B.B. Mwalyosi, Prof. P.Z. Yanda, Prof. E.K. Shishira, Dr. C.G. Mung'ong'o, Dr. A. Majule

3.2.13 Resource Poor Environment and Poverty Alleviation in Mbinga District

This research project was financed by REPOA. The main objective of this project was to assess performance and effectiveness of *Ngoro* and *Malonga* farming systems in Matengo highlands in the conservation soil fertility and enhancement of crop productivity.

The results show that *ngoro* farming practice has more positive impacts on poverty alleviation, environmental management and sustainable agriculture compared to *malonga* system. *Ngoro* system is more effective on prevention of soil erosion. On the other hand, cultivation along the hills using *malonga* practice leads to soil erosion reduces soil fertility and productivity. Non-farm income generating activities are associated with *malongo* farming systems and thus appear to be adopted as a strategy of reducing poverty. This farming system is associated with marginal environments where agriculture is not favorable.

Researchers: Prof. P. Yanda Dr. A. Majule, and Dr. A. Mwakaje

3.2.14 Development of Sustainable Soil Fertility Management Practices Through Innovative Training, South Eastern Coastal, Tanzania

Declining soil fertility in southern east coastal areas have reported to be rapidly following land clearing and cultivation as well as after dusting elemental sulphur on cashew trees. Poor nutrients cycling including inability of farmers to apply inorganic fertilizers are common to the majority of farmers. However, recent research finding involving two farmers research groups in Tandahimba and Nachingwea districts have indicated that soil fertility and crop yields can be improved if organic residues sources are properly incorporated in soils. This information is limited to very few farmers and extension staff in the area. An innovative training approach through classes and field demonstrations is therefore needed at least for a period of one season in order to disseminate the information generated so far.

The main purpose of this study is to develop and disseminate sustainable soil fertility management strategies.

The objectives for undertaking this research are therefore

- a) To provide training to both extension workers and farmers on the role of different organic residues sources in maintaining soil fertility.
- b) To allow farmers and extension workers to develop soil conservation strategies in order to sustain land productivity and alleviate poverty.
- c) To enable farmers to appreciate responses of different management strategies as indicated by crop responses.

This project started with farmers training which took place at Naliendele Agricultural Research Institute in July, 2005. It has developed a lot of interest in the Ministry of Agriculture and Food Security through PADEP Project. Project area has been expanded to cover more districts where PADEP operates. In the future, over 20 districts will be covered with support from PADED. At this time, farmers are implementing different soil fertility management practices they selected in their individual plots.

Researchers: Dr. Majule, A.E.; Prof. Shishira, E.K., Dr. L. Kasuga and Mr. Samuel Mugogo

3.2.15 Climate Human Environment Interactions in Africa

The IRA and the Change de Recherches (CNRS) though Centre European de Recherches at d'Enseignement des Geosciences de l'Environnement (CEREGE) of France have developed a joint research project called "Climate – Environment and Human Dynamics in Africa (CLEHA). The project operates in the Southern Highlands of Tanzania and seeks to address the following questions:

- What are the contributions of climate change and human impacts on tropical environments as reconstructed for Holocene (vegetation, water resources, soils, etc.) and;
- What are the consequences of environmental change on the livelihood of human societies?

In order to address these key issues, routine data collection is needed for reconstructing the past history of climate change so that we can predict the future. In light of this requirement, a monitoring station has been established at Masoko, Rungwe District. Currently, there is an ongoing data collection on temperature, rainfall, soil erosion and other socio-economic data on the surrounding environment. A number of research papers have been published and some are under preparation. There is also a move toward more integrated research which is going to involve more researchers to address research, training and development issues in the area.

IRA Researchers: Dr. A. E. Majule, Prof. R. Mwalyosi, Dr R. Kangalawe and Dr E T Liwenga

3.2.16 The Role of Non-Wood Food Forest Products on Poverty Alleviation in the Southern Coastal Areas of Tanzania

The overall focus of the study is on the role of edible non-wood forest products and how they contribute to poverty alleviation. In undertaking the study, field work was conducted in Mtwara Region in two districts – Mtwara Rural and Tandahimba. In each district participatory studies and field observations were undertaken. Findings indicate existence of different socio-economic groups in each village whereby the majority of the people are poor and live below the poverty line. A fairly large proportion of the population depend for their livelihoods on non-wood food forest products for their livelihood. Thus, for example, the use of *ming'oko* has increased and overexploitation has changed the availability and size of the product. Poverty alleviation in these areas is constrained variably by several factors including lack of or poor water services, schools and other related infrastructure. Further, ecological characterization of different non-wood forest products needs to be undertaken in order to understand the impact of exploitation on the environment. A final draft research report has been submitted to REPOA which funded the project.

Researchers: Dr. A. Majule, Dr. E. Liwenga and Mr. H. Ndangalasi

3.2.17 Wetland Utilisation, Poverty Alleviation and Environmental Conservation in Semi Arid Areas of Tanzania – The Case of Dodoma

The study is funded by REPOA. Major objectives are;

- To assess the current wetland utilization pattern and how that promotes food security and reduces poverty levels

- To ascertaining utilization practices that may lead to the degradation of wetlands and how these effects could be minimized.
- To establishing ways in which benefits accrued from the wetlands could be optimized without compromising the ecological and hydrological integrity of the wetlands.
- To study existing land tenure system and its implication on land use pattern and environmental management.

Field work has been completed and final draft report was submitted and presented to the Annual REPOA Workshop in 2005. Researchers are now working on the comments before final submission. However, key research findings indicates that;

a) There are a number of socio economic activities undertaken in Bahi wetlands and these have significant contribution on poverty levels interms of food and cash to the community living in such areas.

b) There has been a differentiation of three major socio economic groups namely *Mgoli* (the rich), *Enachiba* (the middle) and *Asinachinji* (the poorer). The former group are very few while the later consist most of the village community. There is high interdependence among the three major groups and this has increased poverty levels of the poorer.

c) The pattern of various resources located in wetlands including water resources, soil fertility and land itself, fish, forest products have been declining over time due to changing environment and over use of resources due to increased human demand.

d) This study has established livelihood interdependence between the rich and the poor in the community. Such interdependences enhances gap between the three wealth groups, hence rich becoming richer and poor becoming poorer.

Researchers: Prof. P. Z. Yanda, Dr. A.E. Majule and Dr. A.G. Mwakaje

3.2.18 Participatory Improvement of Soil Fertility and Water Management for Sustainable Small Scale Agriculture in Tanzania, Malawi and Zimbabwe

In mid-2004, funds were made available to IRA by FIRCOP-SADC to develop a concept proposal into a full proposal on the subject above. The project involves three SADC countries, Tanzania, Malawi and Zimbabwe. The project aims at increasing crop productivity and raising farmers' incomes through improved sustainable soil and water management in the context of changing livelihood systems. The main objectives are:

- ❑ To understand current farmers' perception and practices regarding soil and water management;
- ❑ To review current approaches by agricultural service providers in relation to changing farming practices and environment;
- ❑ To build on and enhance farmers' capacity to manage soil fertility and water at farm level through development of innovative learning approaches and tools;
- ❑ To identify implications for private and public sector service provision relating to soil fertility management and;
- ❑ To investigate the impact of soil and water management on livelihoods and provide sustainable recommendations for action.

The project will use participatory approaches involving key stakeholders who will identify, prioritise problems and develop sustainable soil and water management practices/services. Activities will include field work, training, stakeholders' and dissemination workshops.

The project has been delayed due to administrative changes took place within FIRCOP SADC including withdrawing of some donors. However further funding is expected.

IRA Researchers: Dr. A.E. Majule, Prof. R. Mwalyosi, Dr. A. Mwakaje and Dr. E. Liwenga

3.2.19 Development of training manual for informal sector and employment

This manual development task was coordinated and prepared by the University consultancy Bureau (UCB) and funded by the International Labour Organisation (ILO). The training manual was tested in Dar es Salaam, Zanzibar and Mwanza. About 40 participants were involved per training. The participants were mainly from the cities/municipal administrators and people who are involved in the informal sector.

Researchers: Prof. S.A.K Mlacha, Prof. Kundi, Dr. Temu and Dr. Agnes G. Mwakaje.

3.2.20 Dairy farming, biogas use and poverty alleviation in Rungwe District: A study of opportunities and constraints

Rungwe District is one of the densely populated districts in Tanzania. It has little 'natural' vegetation which in recent years, much of these 'natural' vegetations has been cleared / transformed for agriculture and habitat. Even those found in government forest reserves and in locally protected areas have been subjected to varying degrees of people driven disturbances.

While deforestation is at a high rate in the district, the district is one of the districts in the country with high population of smallholders' dairy keepers. Keeping of dairy cows contributes positively to the poverty alleviation through provision of income, nutrition and food security. Dairy keeping also contributes positively to the environment through animal manure provision. However, the activity also significantly increases work-load for those who provide fodder for cattle and clean the stalls. This study investigates the opportunities and constraints of biogas use in Rungwe district. A preliminary field visit and main study has been undertaken and now the work is on data analysis and draft report production.

Researchers: Dr. Agnes G. Mwakaje and Prof. R.B.B Mwalyosi

3.3 Future Research and Consultancy

3.3.1 Environmental Monitoring Assistance to Dar es Salaam Water and Sewerage Authority (DAWASA)

This is a consultancy project commissioned by the Dar es Salaam City Water Services. This project is to last five years, although it will be implemented on yearly basis. The budget for the first year is a US \$ 84.2 thousands.

The objectives of the project are:

- Assist DAWASA to develop and implement an environmental review and reporting plan, procedures, standard tests, and reporting formats
- Assist DAWASA to review the various environmental compliance reports submitted by the Operator, Contactor, etc to ensure that the requirements of various Acts, Regulations, Contracts, and Licences have been complied with and that the submitted reports are fair and reasonable statement of environmental performance / compliance by the Operator and Contractors.
- Assist DAWASA to report progress and performance against the agreed Environmental Management Plan, and
- Train DAWASA environmental staff so that they can effectively deliver and sustain an appropriate environmental review and reporting program.

The first year programme ends in August 2005. As the programme comes to the end, the following has been achieved:

- Establishment of monitoring sites
- Establishment of analysis parameters to gauge the performance
- Composing/setting-up a monitoring programme and its subsequent implementation

- Generation of performance data
- Influencing awareness to environmental implications of DAWASA activities through repetitive meeting with some of the employees
- Development of a Report Format
- Development of Database
- Conducting on-job training to DAWASA staff
- Influencing quality assurance to the Private Operator
- The EMA team gained experience in carrying out the monitoring

Immediate future activities include:

- Starting negotiations with DAWASA for the second year operations to ensure continuity in data collection and recording.

Researchers: Prof. R.Mwalyosi, Dr. H. Sosovele, Prof. A. Mashauri, Dr. R. Mato and Mr. Pallangyo.

3.3.2 Development of Poverty-Environment Indicators in Tanzania

The overall aim of this work is to develop a set of indicators linking poverty and environment in Tanzania that can be used to understand poverty- environment interactions and to monitor poverty reduction that can result form environmental change. The specific objectives of the consultancy include (i) to assess and determine the different use of poverty-environment indicators from local to national levels, (ii) to identify existing data collection systems and surveys producing, or with the potential to provide poverty-environment indicators, (iii) to propose a core set of poverty-environment indicators for use by the poverty monitoring systems and the local level; planning and (iv) to build national capacity on development and use of poverty-environment indicators.

The VPO/UNDP is funding this work as part of the process to revise the Poverty Reduction Strategy and Poverty Monitoring System. Data collection is has been completed. Data analysis is now in progress. The work is undertaken in collaboration with Environmental Resources Management (ERM) on United Kingdom. Draft Report has been submitted to VPO/UNDP

IRA Researchers: Dr. H. Sosovele; Prof. R. Mwalyosi; Dr. R. Kangalawe; Dr. Emma Liwenga and Dr. F. Shechambo.

3.3.3 Implications of Rural-Rural Migration and Expansion of Livelihood Activities on Water Resources and Wetlands of the Kilombero Valley, Tanzania

This study has been accepted by WARFSA for funding. The objective of this study is to examine the implications of immigration of rural communities on

natural resource management and people's livelihoods in the wetlands of Kilombero Valley in Tanzania. The study will be conducted by

Researchers: Dr. Kangalawe, Dr Liwenga, and Prof. Madulu

SECTION FOUR: PUBLICATIONS

A total of 70 publications had been produced. They include 1 book, 10 chapters in books; 18 journal articles, 5 journal articles sent for publication and 36 research reports, consultancy reports and workshop proceedings, as indicated below.

4.1 Books

1. Kangalawe, R.Y.M., Majule, A.E. and Shishira, E.K. (2005). *Land-use dynamics and land degradation in Iramba District, central Tanzania*. Organisation for Social Science Research in Eastern and Southern Africa, Addis Ababa, (ISBN 1 9048855 62 8)

4.2 Chapters in Books

2. Kangalawe, R.Y.M. (2004). *Threats and opportunities for sustainable management of dryland biodiversity in tropical degraded environments: A case of Irangi Hills in central Tanzania*. In: Oyieke, H., Khayota, B., Kamondo, B., Ochuodho, T., Gichuki, N., Malo, M., and Busienei, W. (eds.). Sustainable biodiversity management for reduced community vulnerability to drought. The Regional Programme for Sustainable Use of Dryland Biodiversity, National Museum of Kenya. pp 174-185. (ISBN 9966-9555-60-7).
3. Kangalawe, R.Y.M. and Liwenga, E.T. (2005). *Management of Wetlands in the Kilombero Valley, Tanzania. Chapter 7*. In: Sosovele, H., Boesen, J., Maganga, F. (eds.). Social and environmental impact of irrigation farming in Tanzania: Selected cases. Dar es Salaam University Press, pp 134-166. (ISBN 9976 60 431 9).
4. Liwenga, E.T. and Kangalawe, R.Y.M. (2004). *Livelihood Dynamics and Food Security in the Semiarid Areas of Central Tanzania: The Case of Destocking in HADO Areas*. In: Batamuzi, E.K, Tarimo, A.J.P. Kinabo, L.D.B. (eds.). Agricultural technology development through participatory research. Publication Number TS2-107. TARP II- SUA Project, Sokoine University of Agriculture. pp 46-55. (ISBN 9987-9006-8-2)
5. Liwenga, E.T. (2004). *Local Resources Utilisation in Drylands: A challenge to sustainable Biodiversity Management in Mvumi, Central Tanzania*. In: Oyieke, H., Khayota, B., Kamondo, B., Ochuodho, T., Gichuki, N., Malo, M., and Busienei, W. (eds.). Sustainable biodiversity management for reduced community vulnerability to drought. The Regional Programme for Sustainable Use of Dryland Biodiversity, National Museum of Kenya. pp 174-185. (ISBN 9966-9555-60-7).
6. van Koppen, B., Sokile, C., Hatibu, N., Lankford, B. Mahoo, H. and Yanda, P. (2005): *Water Rights and Water Fees in Rural Tanzania*. In: Molle, F., Barker, R., and Berkoff, J., (Eds.): Between Prescription and Practice: Irrigation water pricing policies in context: pp 34.

7. Wandiga, S. O., Opondo, M., Olago, D., Githeko, A., Githui, F., Marshall, M., Downs, T., Opere, A., Yanda, P.Z., Kangalawe, R., Kabumbuli, R., Kirumira, E., Kathuri, J., Apindi, E., Olaka, L. Ogallo, L. Mugambi, P., Sigalla, R., Nanyunja, R., Baguma, T. and Achola, P. (Forthcoming): *Vulnerability to climate induced highland malaria in east Africa*. In: N. Leary, C. Conde, A. Nyong and J. Pulhin, eds., Accepted for Publication in Dimensions of Vulnerability in a Changing Climate - Case Studies from the Developing World.
8. Yanda, P.Z., Wandiga, S. O., Kangalawe, R., Opondo, M., Olago, D., Githeko, A., Githui, F., Marshall, M., Downs, T., Opere, A., Kangalawe, R., Kabumbuli, R., Kirumira, E., Kathuri, J., Apindi, E., Olaka, L. Ogallo, L. Mugambi, P., Sigalla, R., Nanyunja, R., Baguma, T. and Achola, P. (Forthcoming): *Adaptation to Climate Change - Induced Malaria and Cholera in the Lake Victoria Region*. Accepted for Publication as a Chapter in the AIACC Adaptation Book.
9. Vogel, C., Nyong, A. Boko M, Niang-Diop, I., Tabo, R. Osman Elasha, B., Githeko, A., Yanda, P.Z., and Medany, M. (Forthcoming). *Africa Chapter – Chapter 9*. Accepted for Publication In: *Climate Change Impacts, Adaptation and Vulnerability. Intergovernmental Panel for Climate Change (Working Group II)*. Fourth Assessment Report
10. Majule A.E, and Mwalyosi, R.B.B. (2005). *Enhancing Agricultural Productivity through Sustainable Irrigation. A case of Vinyungu Farming System in selected Zones of Southern Highlan, Tanzania*. A chapter in a Book Social and Environmental Impacts of Irrigation farming in Tanzania: Selected Cases: Edited by H.Sosovele, J. Boesen and F. Maganga. Dar es Salaam University Press. ISBN 9976 60 431 9
11. Mwakaje A.G and C.H Sokoni (2005): *Crop-livestock integration in Irrigation Farming Systems and Conflict Reduction*: In Social and Environmental Impact of Irrigation Farming in Tanzania: Selected Case Studies

4.3 Journal Articles

12. Kangalawe, R.Y.M. and Liwenga, E.T. (2005). *Livelihoods in the Wetlands of Kilombero Valley in Tanzania: Opportunities and Challenges to Integrated Water Resource Management*. Physics and Chemistry of the Earth 30: 968-975
13. Yanda, P.Z., Kangalawe, R.Y.M. and Sigalla, R.J. (2005). *Socio-economic Characteristics Influencing Vulnerability and Adaptation to Climate Change-Induced Malaria and Cholera in the Lake Victoria Region*. AIACC Working Paper No. 12.
14. Madulu, N.F. (2004), *Assessment of Linkages Between Population Dynamics and Environmental Change in Tanzania*, African Journal of Environmental Assessment and Management, Vol. 9, October 2004, pp. 88-102 (ISSN 1438-7890).

15. Madulu, N.F. (2004). *Digging for a Living in Tanzania: Migration, Farming Traditions and Current Mining Pursuits in the Lake Victoria Basin*, Tanzanian Economic Trends, Vol. 17, No. 1, pp. 65-78 (ISSN 0856-3373).
16. Madulu, N.F. (2005). *Impacts of Population Pressure and Poverty Alleviation Strategies on Common Property Resource Availability in Rural Tanzania*, African Journal of Environmental Assessment and Management, Vol. 10 March 2005, pp. 26-49 (ISSN 1438-7890). (<http://www.ajeam-ragee.org/vol10March2005p26-49.pdf>)
17. Yanda, P.Z. and N.F. Madulu (2005). *Water resource management and biodiversity conservation in the Eastern Rift Valley Lakes, Northern Tanzania*, Physics and Chemistry of the Earth, Vol. 30, Issue 11-16, pp. 717-725.
18. Mvungi, A.K, D. Mashauri and N.F. Madulu (2005). *Management of water for irrigation agriculture in semi arid areas: problems and prospects*, Physics and Chemistry of the Earth, Vol. 30, Issue 11-16, pp. 809-817.
19. P.Z Yanda J.O Ngana 2005. *Highland-Lowland Ecosystems and Livelihood Options in the Hingilili Basin in the Pare Mountains*. Paper submitted to the Journal of Environment, Development and Sustainability.
20. Pius Yanda and J.O.Ngana (2005). *Sustainable Management of the Malagarasi-Muyovozi Wetlands - Integrated Assessment of natural and socio economic resources* . Paper submitted to Journal of the Physics and Chemistry of the Earth
21. Yanda, P.Z. and Madulu, F (2005): *Water Resource Management and Biodiversity Conservation in the Eastern Rift Valley Lakes, Northern Tanzania*. Physics and Chemistry of the Earth, Parts A/B/C, Volume 30, Issues 11-16. P. 717-725
22. Yanda, P.Z. (Forthcoming): *Implications of Population Increase and Land Tenure on Land Resources Integrity in the Kondoa Lower Irangi, Central Tanzania - The Case of Mrijo Village*. Accepted for Publication in Journal of Population Studies and Development
23. Yanda, P.Z. (Forthcoming): *The Changing Environment and Livelihood Strategies in the Rural Setting – The Case of Lower Irangi, Kondoa District, Central Tanzania*. Accepted for Publication in: UTAFITI Journal
24. Yanda, P.Z., Kangalawe, R.Y.M. and Sigalla, R. (2005): *Climatic and Socio-Economic Influences on Malaria and Cholera Risks in the Lake Victoria Region of Tanzania*, Article in Press – IJEE
25. Majule, A., Shishira, E.K. and Yanda, P.Z. (2005): *Declining Soil Fertility: A Challenge For Sustainable Productivity of Land Under Cashew Farms, Southern Areas Of Tanzania*. Accepted for Publication in: Journal of Tanzania Geographical Association.

26. Majule, A., J.O. Omollo and P.Z. Yanda (Forthcoming): *Response of Maize During Amelioration of Sulphur Induced Acidity with Organic Residues in Cashewnut Growing Soils of Mtwara, Tanzania*. Accepted for Publication in Tanzania Journal of Sciences
27. Majule, A., Shishira, E.K. and Yanda, P.Z. (2005): *Soil Fertility Response to the Application of Selected Organic Residues under Sulphur Dusting in Southern Tanzania*. Bunda J. of Agric. Env. Sci. and Tech. Vol. 3-1, pp. 1-11.
28. Manuella Delalande, Laurent Bergonzini, Frederic Beal, Yannick Garcin, Amos Majule and David Williamson. (2005). *Contribution to the detection of Lake Masoko (Tanzania) groundwater outflow: Isotopic evidence (18O, D)*. Hydrological Sciences-Journal. 50 (5). Pp 867-880.
29. Yannick Garcin, David Williamson, Maurice Taieb, Annie Vincens, Pierre-Etienne mathe, Amos Majule. (2005). *Centennial to millennial changes in maar-lake deposition during the last 45,000 years in Tropical Southern Africa (Lake Masoko, Tanzania)*. Paleogeography, paleoclimatology, paleoecology (forthcoming)

4.3 Journal Articles submitted for publication

30. Yanda, P.Z. and Shishira, E.K. (2005): *Diminishing Natural Resource Base and Peoples' Response in the Pare-Usambara Area, North Eastern Tanzania*. Submitted to African Journal of Environmental Assessment and Management (AJEAM).
31. Yanda, P.Z., Shishira, E.K., Mwakaje, A.G. and Majule, A.E. (2005): *Underlying Threats on Forest Reserves in Tabora Region, Wstern Tanzania*. Submitted to African Journal of Environmental Assessment and Management (AJEAM).
32. Yanda, P.Z. and Madulu, N.F. (Forthcoming): *Natural Resources Use Patterns in the Highlands and Lowlands of Karatu and Monduli Districts: A Study on Linkages and Environmental Implications*. Submitted to Journal of Environmental Information
33. Olago, D., Marshall, M., Wandiga, S.O., Opondo, M., Yanda, P.Z., Kangelawe, R., Githeko, A., Downs, T., Opere, A., Kabumbuli, R., Kirumira, R., Ogallo, L., Mugambi, P., Apindi, E., Githui, F., Kathuri, J., Olaka, L., Sigalla, R., Nanyunja, R., Baguma, T. and Achola, P. (Forthcoming): *Climatic, Socio-economic and Health Factors Affecting Human Vulnerability to Cholera in the Lake Victoria Basin, East Africa*. Submitted to Ambio
34. Yanda, P.Z., Majule, A.E. and Mwakaje, A.G. (Forthcoming): *Implications of Farming Practices on the Environment, Food Security and Poverty Levels in Matengo Highlands, Mbinga District, Southern Tanzania*. Submitted to IJEE

4.4 Other Publications (Research Reports, Service Reports, and Conference Proceedings)

35. Kangalawe, R.Y.M., Majule, A.E. and Shishira, E.K. (2005). *Land-use dynamics and land degradation in Iramba District, central Tanzania*. Research Report submitted to OSSREA.
36. Horberry, J., Sosovele, H., Shechambo, F., Liwenga, E., Kangalawe, R., Smith, D., and Shah, N. (2005). *The Development of Indicators of Poverty-Environment Linkages*. Consultancy Report Submitted to the Vice President's Office, Dar es Salaam.
37. Kangalawe, R.Y.M. and Liwenga, E.T. (2004). *Livelihoods in the Wetlands of Kilombero Valley in Tanzania: Opportunities and Challenges to Integrated Water Resource Management*. Paper presented at the 5th WATERnet/WARFSA Annual Symposium, "IWRM and the Millennium Development Goals: Managing Water for Peace and Prosperity". Held at the Safari-Hotel Conference Centre, Windhoek, Namibia, 2-4 November 2004.
38. Kangalawe, R.Y.M. and Lyimo, J.G. (2004). *Local Knowledge and Its Role in Sustainable Agriculture in the Southern Highlands of Tanzania: A Case of the Matengo Pit Cultivation System of Mbinga District*. Paper presented at the 6th National Workshop, 2004 of OSSREA's Tanzania Chapter, held in Dar es Salaam, 16-17 December 2004.
39. Liwenga, E.T. and Kangalawe, R.Y.M. (2004). *Poverty Alleviation Strategies and Environmental Implications in the Semiarid Areas of Central Tanzania: The Case of HADO Areas*. Paper presented at the "NEMC Scientific Conference on Environmental Sustainability in Tanzania: Agriculture, Environment and Poverty Eradication" held at White Sands Hotel, Dar es Salaam, 28-30 September 2004.
40. Liwenga, E.T. and Kangalawe, R.Y.M. (2004). *Environmental Conservation and Management of Dryland Biodiversity in Central Tanzania with Reference to Poverty Alleviation Strategies*. Paper Presented at the "East Africa Conference on Dryland Biodiversity: Its Status, Challenges and Prospects for Sustainable Management" held at Merica Hotel, Nakuru - Kenya, 17-21 November 2004.
41. Mwalyosi, R.B.B., Liwenga, E.T. and Kangalawe, R.Y.M. (2004). *Management Of Dryland Resources: IRA's Role In Spearheading Research For Sustainable Development*. Paper Presented at the "East Africa Conference on Dryland Biodiversity: Its Status, Challenges and Prospects for Sustainable Management" held at Merica Hotel, Nakuru - Kenya, 17-21 November 2004.
42. Kiwasila, H (2005). *Managing Water Conflicts Through 'Traditional' Institutions in Pangani Basin*. Paper presented at the workshop on Legal pluralism and Implications for Implementing IWRM. Workshop Organized by IRA 1-2 Dec 2005. White Sands Hotel, DSM. Unpublished Paper

43. Kiwasila, H (2005). *The Genesis of Female Genital Mutilation*. Paper Presented at the Stakeholders Workshop. Annual Meeting of the Tanzanian Chapter of the East African Chapter for Eradication of FGM held at CCT 6-8, 2005 December, Dodoma Tanzania. Workshop Organized by the Ministry of Community Development, Gender and Children. Unpublished Paper.
44. Kiwasila, H (2004). *The Bagamoyo SUDPF Gender and Socio-Economic Study Volume 1-III*. Report Submitted to SWP International Sweden AB and the Bagamoyo District Council march 2005. Final Consultancy Report. Unpublished.
45. Kiwasila, H (2005). *Youth Empowerment and Life Skills Development*. Needs Assessment Report, Mikumi Division in Kilosa District. WRDP Report June 2005.
46. Madulu, F and Kiwasila, H (2005). *Causes and Consequences of Changing Livelihood Diversification in Kiteto and Simanjiro Districts in Northern Tanzania*. Preliminary Assessment of Risks. Draft Report, February 2005.
47. Mitzlav, E; Mwakaje, D and Kiwasila, H (2005). *Socio-Economic Aspects of the Impact of the Pangani Falls Re-Development Project*. Post Evaluation report Submitted to ORGUT and WSP International Sweden AB. August 2005
48. Amandina, L; Kaduma, Mponzi T.F and Kiwasila, H (2005). *Report on the Evaluation for Accreditation of the Bagamoyo College of Arts*. Unpublished Report Submitted to NACTE 20th October 2005.
49. Quinn, C; Huby, M., Kiwasila, H and Lovett, C (2004). *Livelihood, Gender and Local Perceptions on Risks in Semi-Arid Tanzania*. Journal of Environment.w.w.w.elsevier.com
50. Madulu, N.F., H. Kiwasila (2005), *Causes and Consequences of changing land use and livelihood diversification in Kiteto and Simanjiro Districts*, Research Report (February 2005)
51. Kangalawe, R.Y.M., E. Liwenga, A. Majule, and N.F. Madulu (2005), *The Dynamics of Farming Systems, Food Security and Poverty Alleviation Strategies in the Changing Environment of the Semiarid Areas of Sukumaland, Tanzania*, Final Research Report Submitted to REPOA, March, 2005
52. Mwakalila, S. and N.F. Madulu (2005), *Indigenous Knowledge in Wetlands Use and Management in the Lake Victoria Basin, Tanzania.*, Interim Research Report Submitted to REPOA, September, 2005.
53. Liwenga, E., R.Y.M. Kangalawe, N.F. Madulu, R. Kabumbuli and M.K. Waligo (2005), *Livelihood Diversification and Changing Land Use Patterns in the Lake Victoria Basin: An Assessment of Causes and Implications to Local Communities*, Research Report for Phase One Submitted to VicRes, October, 2005.

54. Madulu, N.F. (2005), *Assessment of Child Mortality in the Refugee Prone Areas of Western Tanzania: The Case of Kigoma and Kagera Regions*, Paper presented at the Annual Demographic Seminar, University of Dar es Salaam, 5th-6th April 2005.
55. Madulu, N.F. (2005), *Water Resource Management in Diverse Ecosystem and Providing for Human Needs: The Case of East Africa*, Paper presented at the UNU-INWEH / UNESCO-MAB-IHP International Workshop on Water and Ecosystems: Water Resources Management in Diverse Ecosystems and Providing for Human Needs, Hamilton, Canada, 14 - 16 June 2005.
56. Madulu, N.F. (2005), *Resettlement Issues in Relation to Power and Hydropower Projects in the Nile Basin*, Paper presented at the Workshop on "Nile Basin Initiative – Confidence Building and Stakeholder Involvement Workshop on Social Issues", Mombasa (Kenya), 14th-15th June 2005.
57. Madulu, N.F. (2005), *Determinants of Women Involvement in Small-Scale Mining and Risks to HIV/AIDS Infection in Tanzania*, Paper presented at the XXV International Population Conference, Tours, France, 18th -23rd July 2005.
58. Mvungi, A.K, D. Mashauri and N.F. Madulu (2005), *Management of Water for Traditional Irrigation Agriculture in Semi Arid Areas: Problems and Prospects in Mwanza District, Tanzania*, Paper presented at the Workshop on "Moral Economy Conference, University of Dar es Salaam, 18th - 20th August 2005.
59. Madulu, N.F. (2005), *Reconstructing the History of Lukobakobe River: An Assessment of Poverty, Socio-Economic Development, and Environmental Linkages in Mwanza Region, Tanzania*, Paper presented at the 6th WaterNet/Warfsa Symposium, Swazi Sun Hotel, Manzini, 1st – 3rd November 2005.
60. J.O.Ngana (2004). *Spring level variation and its relation with rainfall in the Upper Pangani Basin*. Proceeding of Workshop on Water Resources Management , Pangani Basin, Institute of Resource Assessment, Moshi.
61. J.O.Ngana. *The relationship between National Water Policy and the Regional (SADC) Water Strategy*. Proceedings of the Workshop on the Finalization of the Regional Water Strategy. Ministry of Water and Livestock Development, Dar es Salaam.
62. Yanda, P.Z., Kangalawe, R.Y.M. and Sigalla, R. (2005): *Climatic and Socio-Economic Influences on Malaria and Cholera Risks in the Lake Victoria Region of Tanzania*, AIACC Working Paper No. 12.
63. van Koppen, B., Sokile, C., Hatibu, N., Lankford, B. Mahoo, H. and Yanda, P. (2004): *Formal Water Rights in Rural Tanzania: Deepening the Dichotomy?*. IWMI Working Paper 71.

64. Yanda, P.Z., Majule, A. E. and Mwakaje, A.G. (Forthcoming): *Wetland Utilisation, Poverty Alleviation and Environmental Conservation in Semi rid Areas of Tanzania – The case of Singida Region*. Accepted for Publication as a Chapter in the EAIRBM Conference Proceedings.
65. Yanda, P.Z., Mwalyosi, R.B.B., Mung'ong'o, C.G., Majule, A. and Shishira, E.K. (2004): *Natural Resources Baseline Studies for Songwe Basin*. Report Submitted to WWF SARPO
66. Yanda, P.Z. and Mwansasu, S.L. (2005): *Tarangire Geo-Information Centre – Completion Report*. Final Report Submitted to TANAPA.
67. Yanda, P.Z., Mwalyosi, R.B.B., Kikula, I.S., Mung'ong'o, C.G. and Mwansasu, S.L. (2005): *Assessment of Viability of Game Controlled Area Category as Wildlife Conservation Areas*. Final Report submitted to Wildlife Division, Ministry of Natural Resources and Tourism.
68. Yanda, P.Z., Shishira, E.K., Mwansasu, S.L. (2005): *Mapping of Catchment Forest Reserves*. Final Report submitted to Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism.
69. Majule A.E. (2005). *Sustainable Livelihood Strategies in Relation to Power Projects in the Nile Countries*. Paper Presented to the Nile Basin Initiative-Confidence Building and Stakeholders Involvement Workshop on Social Issues. 14-15th June 2005, Mombasa, Kenya
70. Majule, A.E. (2005). *Research Synergies between The York University (UK) with The Institute of Resource Assessment*. Paper Presented to the KITE Workshop, Environment Department University of York, UK, 4/5th August 2005

SECTION FIVE: FINANCES

5.1 Sources of Funds

5.1.1 Government Sources

During the year 2004/2005, the Institute received a budgetary allocation of TShs 13,893,000 from the Government through the University of Dar es Salaam to cover other charges, over and above personal emoluments. TShs 4,000,000 were allocated for research.

5.1.2 Own Sources

The Institute continued to generate funds from internal sources. These came mainly from community services rendered. These services contributed approximately TShs. 113 Millions and US\$ 192,000. The figures are based on a 40% charge on professional fees from consultancies and public service work by its staff.

SECTION SIX: APPENDICES

Box 1: List of Academic Members of Staff

1. **Raphael B. B. Mwalyosi, Professor, Director**, B.Sc. Hons, M.Sc. (Dar), Ph.D. (AUN). Ecology.
2. **Hussein Sosovele, Senior Research Fellow, Associate Director**, BA Hons; M.A. (Dar), Ph.D. (Bremen) Sociology.
3. **Elieho K. Shishira, Associate Professor**, B.Sc., Hons, (E.A), M.Sc., Ph.D. (Sheffield) Applied Geomorphology, Remote Sensing of Land Resources, Land Classification.
4. **Ndalahwa F. Madulu, Associate Professor**, B.Ed. Hons, M.A. (Dar) Demography, Ph.D. (Dar). Demography.
5. **Idris S. Kikula, Professor**, B.Sc. Hons; M.Sc. (Dar) Ph.D. (Griffith) Land Resource Management, Environment and Remote Sensing. **
6. **James O. Ngana, Associate Professor**, B.Sc. Hon.; M.Sc. (Dar), M.Sc. (Galway), Ph.D. (KTH, Stockholm) Water Resources.
7. **Pius Z. Yanda, Associate Professor**, B.Sc., Hons; (Dar), Dip. MNRSA; M.Sc. (AUN) , Ph.D. (Stockholm) Environment, Water Resource Development.
8. **Fanuel C. Shechambo, Senior Research Fellow**, Dip. Lib. (Makerere), BA, Hons; M.A. (Econ.) (Dar), Dr.sc.agr. (TU Berlin) Agricultural and Resource Economics.
9. **Faustin P. Maganga, Senior Research Fellow**, BA Hons; M.A. (Dar), M.Sc. (Zimbabwe), Ph.D. (Roskilde) Institutional Aspects of Natural Resource Management***.
10. **Claude G.M. Mung'ong'o, Senior Research Fellow**, Dip. Lib. (Makerere), B.A. Hons (Dar), M.A. (Dar), Ph.D. (Stockholm). Environmental Sociology.
11. **Amos Enock Majule, Research Fellow**, B.Sc. Agric. Hons (SUA), Ph.D. (Reading) Environment, Soil Fertility and Conservation.
12. **Agnes Mwakaje, Research Fellow**, B.Sc. Agric. Hons (SUA); M.Sc. Agric. Economics (Reading) Ph.D. Agric. Economics (London)

13. **Hidergard L. Kiwasila, Research Fellow**, BA Hons (Dar) M.P.H. (North Carolina) PGWSST (Loughborough) Sociology, Public Health. *
14. **Richard Y.M. Kangalawe, Research Fellow**, Dip. Crop Prod. (Uyole), B.Sc. Agric. (SUA), M.Sc. (AUN), PhD (Stockholm).
15. **James G. Lyimo, Assistant Research Fellow**, B.Sc. Agric. (SUA), PGDIP. MNRSA, M.Sc., (AUN) Natural Resource Management. *
16. **Emma T. Liwenga, Research Fellow**, Dip.Crop Prod. (Uyole), B.Sc. Agric. (SUA), M.Sc. (AUN).
17. **Simon Mwansasu, Assistant Research Fellow**, Visual C++ Programming (QA, UK), B.Sc. Hons; M.Sc. (Pinar Del Rio,Cuba). Forest Engineering
18. **Catherine Massao, Assistant Research Fellow** B.Sc.(Gen) UDSM, M.Sc – Conservation Biology, Kent – Canterbury UK
19. **C. Silangwa, Assistant Research**, Diploma Education (Korogwe), B.Educ. (UDSM), MA Demography (UDSM)

Key:

- * **On study leave**
- ** **On secondment**
- *** **On sabbatical leave**
- **** **On leave without pay**

Box 2: List of Technical Staff

1. **Stephen K. Kajula, 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 in Cartography (Horsens Polytechnic, Denmark).
3. **Chrisant Msonganzila, Senior Field Officer**, Dip. Crop. Production (Uyole).
4. **Augustine J. Yonah, Senior Field Officer**, Certificate in Social Work, ISW (Dar).

5. **Evod B. Ulaya, Field Officer I**, Certificate in Rural Development Planning (IRDP Dodoma).
6. **Alexander Mnyenyelwa, Technician**, FTC (Arusha Tech. College).
7. **Captain Patrick Kikwaya**, System Administrator, BSc (Electronic Science and Communication), UDSM
8. **Olipa Ngereja**, GIS Laboratory Scientist, BSc Hons –Survey (UCLAS)

Box 3: List of Administrative Staff

1. **Eva-Grace Mosha, Administrative Officer**, Dip.Ed. (Morogoro), B.A (Ed.) (UDSM), M.A. (UDSM).
2. **Peter E.K. Damson, Accountant**, ADA (IFM).
3. **Prisca Kuhanga, Assistant Supplies Officer**, Diploma in Business Administration, Advanced Diploma in Materials Management.
4. **Mary Mwavalla, Office Management Secretary.**
5. **Anita Kidinilo, Office Management Secretary.**
6. **Sophia M. Mwakibete, Office Management Secretary.**
7. **Agnes Holela, Secretary Grade I**
8. **Bruno Mwano, Driver.**