

UNIVERSITY OF DAR ES SALAAM
INSTITUTE OF RESOURCE ASSESSMENT



Annual Report
July 2002 – June 2003

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BOARD OF DIRECTORS

List of IRA Board Members (2000/01 – 2002/03)

1. **Ms Regina E. Kapinga**, COSTECH
2. **Mr. Richard Muyungi**, VPO
3. **Mr. R.N. Muheto**, NEMC
4. **Mr. Isaya Y. Mnangwone**, Ministry of Natural Resources and Tourism
5. **Mr. Cletus P.B. Mkai**, National Bureau of Statistics
6. **Mr. G.S. Ngaleya**, PMO
7. **Dr. H.L. Mambo**, UDSM Library
8. **Dr. S.H. Sinda**, IDS
9. **Prof. A.H. Mruma**, Department of Geology
10. **Mr. B.J. Sanyagi**, DUP (1996) Ltd
11. **Dr. Davis Mwamfupe**, Geography Department
12. **Dr. W.E. Maro**, ERB
13. **Prof. R.B.B. Mwalyosi**, IRA
14. **Prof. J.O. Ngana**, IRA
15. **Dr. H. Sosovele**, IRA
16. **Prof. N.F. Madulu**, IRA
17. **Prof. P.Z. Yanda**, IRA
18. **Mr. S. Kajula**, IRA

DIRECTOR'S FOREWORD



IRA Director Prof. Raphael B B Mwalyosi

During the reporting period (July 2002 – June 2003), the Institute of Resource Assessment (IRA) has been engaged in a major policy formulation, likely to impact significantly on the official thinking and policy-making in Tanzania. The Institute developed a New Research Agenda for guiding research up to the year 2007. The IRA will concentrate on the following five core areas of research:

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

It is a fact that the management of the environment and natural resources has to be within the context of sustainable development, which by its nature is multi-sectoral. Both international and national commitments towards management of natural resources advocate participatory approaches. The rationale is based on the well-established findings that top-down approaches to development do not work. The design of IRA took this multi-sectoral approach into consideration. IRA has built multidisciplinary and interdisciplinary expertise and capacity, which will

be used to guide and demonstrate true participatory planning and natural resource management.

Agricultural production is another interactive involvement of many people in differing institutional contexts. IRA's approach to research in this sector will of necessity involve multiple systems of research, including: agro-ecosystems analysis; farming systems research; participatory rural appraisal and planning; participatory poverty appraisal; participatory social assessment; rapid food security analysis and marketing and input supply analysis. IRA will be exploring linkages between this sector and other sectors and the environmental and socio-economic implications of such linkages. Attention will be paid to irrigation initiatives and their implications on food security, environment and income generation among rural communities.

Population issues also cut across all sectors and are the task of every institution including IRA. The multidisciplinary and interdisciplinary expertise of IRA places it in a better position to address these issues. A multidisciplinary and interdisciplinary policy analysis can also serve to unveil the implications of various customary laws for implementing integrated resources management. We are convinced that since Tanzania has a pluralistic legal system, diverse customary laws are often more important than statutory law and are relied upon in resolving natural resource conflicts at local levels, hence the desire to research on these.

Also, during the reporting period, the Institute maintained maximum alertness to capture current national and international socio-economic and environmental thinking through review of its 1996/1997 – 2000/2001 Strategic Rolling Plan. Through this planning process, the Institute produced its new Vision and Mission statements as well as Strategic Institutional Objectives, within the framework of the UDSM 2000 Institutional Transformation Programme.

The year 2002/03 was relatively productive. The Institute undertook and completed more than 6 research projects, 6 consultancy studies and published 4 papers in international journals and 2 books.

As we look forward to another fruitful 2003/04, we dedicate ourselves to putting more effort into research, consultancy and training.

1 OVERVIEW OF THE INSTITUTE (IRA)

1.1 IRA Vision, Mission and Strategic Objectives

The Vision of IRA is *“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”*.

The Mission is *“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”*.

The strategic objectives of the Institute of Resource Assessment are as follows:

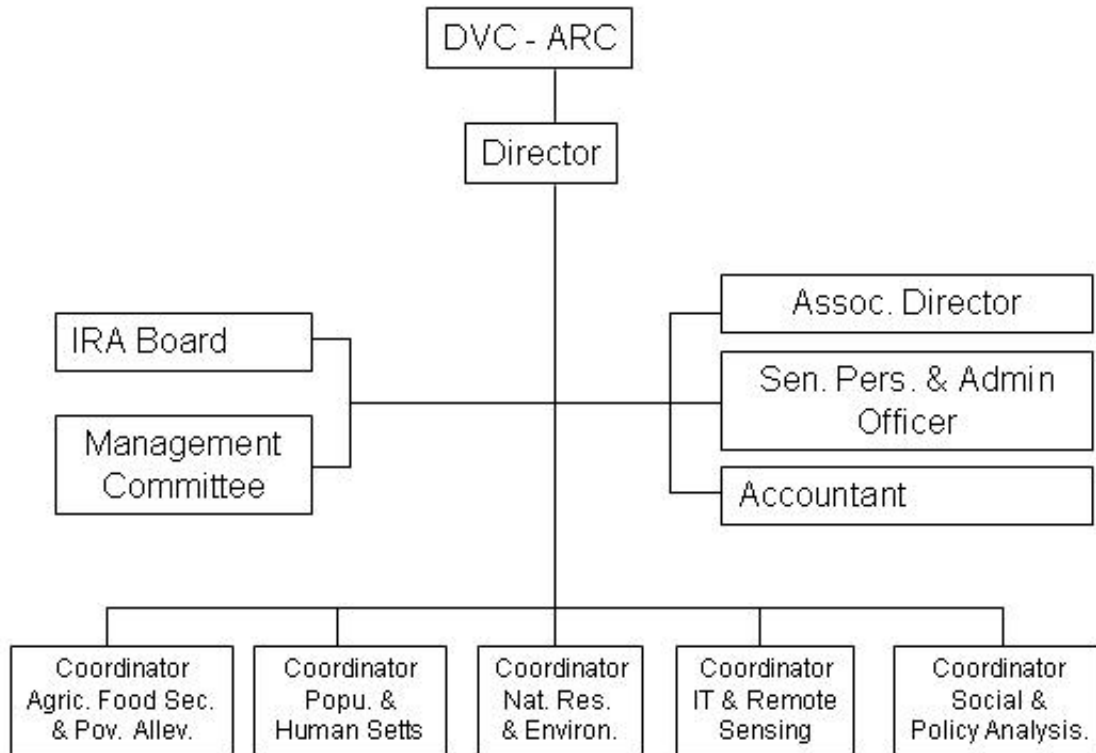
- Human resource capacity and development improved
- Infrastructure and facilities improved
- Marketing and public relations improved
- Quality research, teaching and community services enhanced
- National and international links increased
- Participatory planning enhanced
- Financial sustainability and management capacity enhanced
- Gender equity in place

1.2 Institutional Set-Up

The Institute derives its mandate from an interim constitution that stipulates its establishment, administrative structure and staffing. Below is a chart showing the organisation structure of IRA. The Director, who reports to the Chief Academic Officer (CACO) and is an Appointee of the University Council, manages the Institute. Through the office of the Director, IRA has two participatory organs to facilitate participatory 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 exploits the fertile treasure of ideas from members of the Institute. The Office of the Director is also

equipped with “generic tools” i.e., the Associate Director, Administrative Officer, and Accountant to help the Director with routine duties so that he focuses more sharply on strategic planning and management of IRA instead of “administering” it. Finally, the Director directly supervises 5 research team leaders or coordinators 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.

IRA's Organizational Structure



1.3 Management and Administration

1.3.1 Management committee

Name	Position
Prof. R.B.B. Mwalyosi	Director
Dr. H. Sosovele	Associate Director and Co-coordinator, Agricultural Systems
Prof. N.F. Madulu	Co-coordinator, Population and Human Settlements
Prof. J.O. Ngana	Coordinator, Natural Resources and Environment.
Dr. C.G. Mung'ong'o	I/c, Documentation
Ms. A. Mushi	Tanzania Natural Resources Information Centre & GIS
Prof. P. Z. Yanda	Co-coordinator, Remote Sensing and Information Systems
Ms. E. Moshia	Administrative Officer

1.3.2 Staff matters

During the academic year 2002/2003 the number of staff members decreased from 37 reported in 2001/2002, to 36. This was due to the retirement of three professors: A. Mascarenhas, A. Kauzeni and M. Mujwahuzi; and recruitment of 2 additional security guards. Of the 36 members, 17 were academic, 6 were technical, and 13 were administrative staff.

During the period, one technical staff, Mr. Simon Mwansasu was re-categorized to academic staff position of Assistant Research Fellow. Also, a former Artisan, Mr. Mgungule Alex Mwa-Mnyenyelwa was re-categorized to a Technician. Mr. Mwa-Mnyenyelwa also attended and successfully completed an eight-week course in GIS and remote sensing application to forest resource management conducted from 7th October to 29th November 2002 at the Geo Information Centre in UCLAS-UDSM. During the same period, Dr. Agnes Mwakaje attended a one-month course on EIA in Stockholm, Sweden. Meanwhile Ms. E. Liwenga graduated with a PhD at Stockholm University, while Ms. Kiwasila and Mr. Lyimo spent most of their time at the Institute, finalizing their dissertations. In addition, the Institute recruited four security guards who are fully employed by the Institute.

Also, Prof. Idris Kikula remained a staff member of the IRA, but continued to work at UCLAS in his new capacity as Principal of the College. Dr. Shechambo

completed his sabbatical leave, but applied for and was awarded leave without pay for one year, which was extended for another six months up to December 2003.

1.4 Links and Collaboration

The Institute continued to strengthen existing formal links with various local and international organizations, while expanding horizons to build new ones. Continuing links include those with the School of Geography, University of Stockholm through the MALISATA research programme; the Centre 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 to be strengthened with the International Institute for Environment and Development (IIED) U.K.; Centre for Development Research (CDR), Denmark; The African Studies Centre, University of Leiden, Netherlands; Population Reference Bureau (USA) and; the Norwegian Agricultural University (NORAGRIC), Norway.

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); Southern Africa Institute for Environmental Assessment; International Association for Impact Assessment; Eastern Africa Association for Impact Assessment (EAAIA); IUCN and UNDP.

Within Tanzania, collaborative research also continued with the Institute of Development Studies, Economic Research Bureau, Faculties of Engineering, Science and Law 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, the Planning Commission and Ministry of Regional Administration and Local Government. Other partners in public service included Tanzania National Parks, National Environment Management Council (NEMC) and the National Bureau of Statistics. Also IRA continued to provide public services to international NGOs and donor communities such as WWF, UNDP and USAID.

1.5 Development of Physical Infrastructure

1.5.1 *Library Services and Documentation Unit*

During the reporting year, the IRA Documentation Unit continued to provide reading materials and photocopying services to Institute staff, other university staff, graduate and undergraduate students.

The link between Bibliographic Base of the Tanzania Natural Resources Information Centre (TANRIC) and the Documentation Unit was established. The database is designed to conform to the format of the Main University Library. In collaboration with staff from the Main Library the programme of computerization of the documentation unit was completed. Software such as MARC, Papyrus and DataBase programmes has been installed.

Some organisations and individuals continued to donate publications to the Documentation Unit. These include: DANIDA, FAO, UNDP, Centre for International Forest Research (CIFOR), Institute for Science Cupertino (ISC), IIED, NEMC, African Studies Centre (ASC), Upssala University, President's Office (Planning Commission), Chr. Michelsen Institute, Population Research Bureau (PRB), Indian Embassy and Nordiska Afrika Institute, Uppsala.

1.5.2 *Computer and Related Facilities*

Accessibility to computer facilities is vital for efficient handling and processing of data/information. The Institute continued to make efforts in procuring new computers to keep pace with advances in Information Technology. Development of a website for the Institute has reached advanced stages.

The Institute has a total of 25 working computers (including 16 desktops and 9 laptops). There are more computers compared to the previous year. Two computers and a printer have been recently acquired through the EIA Expertise Database for Eastern Africa project. An office close to TANRIC is being furnished to house this database.

The Institute has a total of 15 Printers ranging from *Bubble jets* to *Large Format Printer like HP DesignJet 5000 PS*. There are more printers compared to the previous year. Out of fifteen printers, three are color printers and the printing range is from A4 to A0.

The Institute has two HP DesignJet plotters, mainly used for plotting maps in Geographic Information System (GIS). The Institute has five digitizing tables each connected to a computer for GIS activities.

1.5.3 Information and Communication Technology Infrastructure

The Institute has recently acquired its own server for Internet connection. 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. A computer has been installed in the documentation unit and plans are underway to link Internet services with the main library. Efforts to computerize the Accounts office are also underway.

2 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, the IRA conducted a second international, two-week policy communication workshop for participants from all-over Africa. 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: Dr. H. Sosovele; Prof. N. Madulu and Ms. H. Kiwasila.

2.1.2 Introductory Course on Strategic Environmental Assessment (SEA) for TANAPA Staff

The SEA Training Course was conducted with the following twin objectives:

- To raise awareness among participants about SEA and its role in decision making and sustainable development
- To develop an understanding of the SEA process itself

Participants were invited from all 12 National Parks as well as one staff from the proposed 13th National Park (i.e. Saadani National Park). Each Park was invited to send a Park Warden In-Charge, the Park Ecologist and the Park Road Engineer. These constitute the top management team at the park level, and their involvement in the course was considered important as, after gaining the understanding of the SEA process, they could ensure its applicability at the Park level.

Trainer: Prof. R.B.B. Mwalyosi

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.

- a) Prof. I. Kikula supervised Ms. E. Liwenga of and Mr. Ndangarasi of Botany Department in their PhD studies
- b) Dr. C. Mung'ong'o continued as local supervisor for Mr. E. Dembe of TANAPA who is doing a Ph.D. study at the International Centre for Protected Landscapes, University of Wales, UK.
- c) Dr. F. Maganga acted as local supervisor for Ms. Susanna Thulin who is doing an M.A. study at the University of Lund.
- d) Dr. F. Maganga acted as local supervisor for Mr. Abdalla Shah, Masters Student (Environmental Management), Yale University.
- e) Prof. J. Ngana supervised Ms. Amani Aimtonga, M.A. (GEM), University of Dar es Salaam.
- f) Dr. H. Sosovele supervised Ms. Beatrice Mchome M.A. (GEM), University of Dar es Salaam.
- g) Drs. H. Sosovele, Mung'ong'o and Maganga taught the M.A Course GE618 (Management and Conservation of Environmental Resources) at the Department of Geography, UDSM.
- h) Dr. A. Majule taught GE 121 (Climatology, Biogeography and Soils); and GE 210 (Soil Resources).
- i) Dr. A. Mwakaje taught GE 211 (Agricultural Planning and policies).
- j) Prof. R. Mwalyosi taught EV619 (Environmental Impact Assessment) to MSc. students

2.3 Review of Teaching Programmes and Curricular

During the year under review, members of staff continued working on modalities of establishing a Masters Degree Programme. The proposed name of the Course is ***Natural Resources and Environmental Management***. At the time of this reporting, stakeholder consultations had been concluded as part of the needs assessment for the programme. The aim of the needs assessment was to solicit views on the planned MSc. programme at the IRA, in order to establish whether or not the output of the programme will be of use to UDSM, national and international development. The results of the assessment would be used to strengthen the proposed programme. The consultations focussed on the following aspects:

- Course structure/content
- Relevance of the course
- Marketability/demand
- Time allocation (for both theory and practice)

- Entry requirements
- Experiences in establishing similar/related degree programmes (e.g. the process, cost aspects, problems, etc.)
- Possible areas of cooperation/collaboration with local and international institutions
- Any other comments/remarks.

The needs assessment exercise involved interviews and consultations with stakeholders (both local and international) categorized as (a) academic institutions; (b) government and policy relate institutions and, (c) international collaborators. Although the pace of response from the different stakeholders has been slow, adequate responses have made it possible to proceed with analysis of the results. Generally, the response has been very positive.

The main recommendations from the consultations include:

- To isolate training aspects that are unique to IRA and those also offered by other institutions in the country or faculties/institutes at the UDSM
- To select manageable training aspects out of the long list
- To find out ways and means of collaborating with existing programmes at the UDSM as well as outside the UDSM in cases where there is likelihood of duplication of efforts.
- Develop curricula

3 RESEARCH AND CONSULTANCY

3.1 Completed Research and Consultancy

3.1.1 Resource Poor Environment and Poverty Alleviation in Mbinga District

The major 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. REPOA financed this study at the cost of US\$ 25,000.

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 favourable.

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

3.1.2 Assessment of the Status for the Proposed National Parks and Surrounding Areas

The objectives of this research work were:

- To map the current land cover/use in the proposed national parks,
- To establish the proportion of different land cover/ use types within and outside the proposed parks,
- To map areas of tourist attraction,
- To map the location of villages surrounding the proposed areas
- To quantify areas required by the villages,
- To establish boundaries for the areas.

The project involved Arusha NP, Kilimanjaro NP, Saadani NP and Kitulo NP. The final report was produced and submitted to TANAPA.

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

3.1.3 Planning and Implementing Community Based Forest Management in Kilwa and Lindi Districts

The village based forest and woodland management project UTUMI (in Kiswahili: 'Utunzaji wa Mimitu') in Lindi Region was started in January 2001 by the Government of Tanzania (GOT) and DANIDA, and was financed under the Environment, Peace and Stability Fund (EPSF). Phase I of this study was reported in the 2000/02 Annual Report.

As a follow-up on the recommendation in the Project Document, DANIDA requested for biodiversity and socio-economic studies by external study teams. Data collection was carried out and a report prepared and submitted. The major findings from this study are:

- A number of factors have influenced the way land rights are acquired and articulated in Lindi region, including slave raiding in the 1800s, colonial conquest wars, monetization of the economy, cash cropping, Ujamaa relocation of the 1970s and wildlife conservation;
- There is a high degree of population mobility in Lindi region. In one village, 50 per cent of the respondents were born outside their district of residence. A number of respondents said that they migrated to the region after learning about economic opportunities in the region and the abundant availability of natural resources. Another factor contributing to population mobility is the villagisation exercise of the 1970s;
- Matrilineal principles are said to be practiced by a number of ethnic groups in Lindi region. Historically, the Mwera, Makonde, Makua and Yao lineages were consistently describes as matrilineal, while the Ngindo were describes as matrilineal in the mid-19th century, but not a hundred years later. Informants from the other dominant ethnic group (Matumbi) state emphatically that they adhere to patrilineal principles;
- Although in many societies forests are used for spiritual and ritual activities, due to the influence of Islam and Christianity in Lindi region, these activities are not very common. However, among the Mwera, initiation ceremonies for boys still take place in the bush and forest areas far away from the boys' homes.

Researcher: Dr. F. P. Maganga

3.1.4 Crop-Livestock Integration in Irrigated Farming Systems as a Strategy for Sustainable Resource Management and Conflict Resolution: The Case of Study of Usangu Basin Mbarali District, Tanzania

The major objective of this research project was to explore crop- livestock linkages in irrigated farming areas as a strategy for conflict resolution. ENRECA funded this research to the tune of US\$ 9,995.

The results of the research suggest relatively low conflicts in midland and highland zones compared to the lowland zone. The midland zone had relatively high levels of crop-livestock integration while the highlands had low livestock populations. Most of the observed conflicts were among farmers themselves i.e. upstream and downstream users.

Inter-household crop-livestock integration has been difficult in the lowland zone because of high livestock population and substantial cultivation (both irrigated and non irrigated) that led to competition for water and land resources, and hence the conflicts between the two farming systems.

In order to minimize conflicts, it is recommended to: promote integration between crop and livestock system through participatory water resource management association; avoid influx of in-migrants (both crop cultivators and livestock keepers); use part of revenue from livestock to invest in the sector; raise awareness on the benefits of crop-livestock integration and; encourage destocking among large-scale pastoralists through price and market incentives

Researchers: Dr. A.G. Mwakaje and Dr. C. Sokoni

3.1.5 Rural Food Security Policy and Development

This was an action-oriented study of rural food security and related policies in Tanzania. Oxfam funded this study, which was coordinated by Institute of Development Studies. Two phases of fieldwork have been completed and the data has already been analyzed and interpreted for Ngorongoro and Shinyanga Districts. The research started in July 1999 with a Launching Workshop that was held on 23rd July 1999 at the Kilimanjaro Hotel, Dar Es Salaam. The project is in its third phase in which research activities have been extended to Njombe District. This part of the study is being funded by UNICEF.

Researchers involved: Dr. C.G. Mung'ong'o in collaboration with Prof. Mbilinyi, Dr. B. Koda (IDS), and Dr. Nyoni (ERB)

3.1.6 Integrated Water Resource Management in Lake Manyara Sub-Basin

Background

This is a water related research project supported by Water Fund for Research in Southern Africa.(WARFSA). The project runs from March 2002 to September 2003.The project budget is US \$ 45,000.

Objectives

The general objective of the study is to establish an integrated water resources management plan in the Lake Manyara sub basin in order to attain both economic and ecological sustainability .

Specific objectives are:

- a) To establish the water resources in the sub basin,
- b) To establish current and future water needs in the basin
- c) To develop water balance between supply and demand for present and future
- d) To develop an integrated water resources management plan through participatory approach

Progress

During the year a paper was developed and presented at the 3rd WARFSA conference held at Dar es salaam at white sands hotel. The title of the paper is Development of Integrated Water Resources Plan for the Lake Manyara Sub Basin to be published in a referred journal.

Similarly in October this year 2003 the 4th Annual WARFSA Symposium will be held at Gaborone Botswana. The title of the paper submitted is titled Strategic Development Plan for Integrated Water Resources Management in Lake Manyara sub basin, North - Eastern Tanzania

The project ends in September this year whereby a Final Report will be submitted to WARFSA. More importantly is that stakeholders in the lake manyara sub basin including districts in Babati, Mbulu, Karatu and Monduli have developed their strategic plan for the sub basin for integrated water resources management. Apart from the districts key stakeholders includes irrigators, livestock keepers, hoteliers, private sectors and public institutions working in the area.

Researchers: Prof. J. Ngana, Prof. R.B.B. Mwalyosi, Prof. P. Yanda and Prof. N.F. Madulu

3.1.7 Enhancing Agricultural production through Sustainable Irrigation: A case of vinyungu farming system in selected zones in Iringa

The major objective of this research was to promote sustainable irrigation for small scale farmers. The specific objectives were:

- To characterize the vinyungu farming system in terms of socio-economic importance to the farming communities
- to assess the environmental impacts of the vinyungu farming system and
- to provide recommendations for sustainable vinyungu farming system

The study results show that *Vinyungu* farming has been practiced for many decades, and has thus become almost a cultural practice. The livelihood and income of many people in the study area is dependent on *vinyungu* farming. *Vinyungu* farming is particularly profitable where mixed or sequential cropping is practiced. *Vinyungu* farming allows for double cropping due to moisture availability from various sources during the dry season. However, conflicts and competition for *vinyungu* farmland and water use is growing and becoming a serious problem that impacts on the socio-economic sustainability of the farming system. Thus, continuation of the current *vinyungu* farming practices is environmentally unsustainable and therefore unacceptable. Particularly, excessive use of chemical fertilizers and pesticides subsequently pollute and degrade the soil and water, subsequently rendering them sterile and/or completely dependent on these artificial chemicals for their continued productivity.

The authors make the following recommendations:

- Vinyungu farming should be encouraged and developed further to maximize profits. Appropriate crop mixture and sequential cropping patterns should be further explored.
- In view of the high demand for irrigation water, it is important to understand the hydrogeology of the area in order to characterize water availability in the area.
- Since vinyungu farming is so crucial for the livelihood of the majority of people in the study area in particular and Iringa Region in general, there is need to ensure equitable land distribution to farmers
- There is need to control the use and application of industrial fertilizers and pesticides in associated with vinyungu farming practices. As much as possible and wherever possible, efforts should be made to introduce and encourage the application of organic fertilizers and pesticides.

- The Districts in which vinyungu farming is taking place should establish and enforce by-laws and regulations that limit cultivation too close to river channels and water sources. Experiences from villages such as Lulanzi to put into practice recommendations from HIMA should be adopted.

Researchers: Dr. A. Majule and Prof. R. Mwalyosi

3.1.8. Natural Resources Use Patterns and Poverty Alleviation Strategies in the Highlands

The objectives of this project were two-fold:

- To document the existing resources use patterns and establish the interactions between human activities and resource use patterns in the highland and lowland areas
- To examine and assess the relationships between population growth

3.1.9 Man-Land Interrelationships

The MALISATA Programme was initiated in 1991 with the support of the Swedish Agency for Research Co-operation (SAREC) to develop an understanding of land degradation in the Kondoa Eroded Area (KEA) in the Kondoa District and other semi arid areas of Tanzania. The programme was meant to provide scientific basis for the operation of the Government supervised Land Conservation Project in Dodoma (HADO).

The Programme came to an end in 2000. During its lifetime the Programme produced 11 PhDs, 3 MSc and over 100 publications which are being synthesized into a Monograph/Book. In a three-day Workshop was held in Dodoma to feedback and solicit stakeholder inputs and reflect on the research output of the Programme. Workshop participants included senior representatives from Kondoa District and the Dodoma Regional Secretariat.

The workshop observed the following:

- As a result of the HADO Project substantial vegetation recovery has been recorded and soil erosion largely controlled.
- Livestock, human settlements, charcoal making, brick making, cultivation, etc. that are being re-introduced into the HADO area haphazardly are threatening the achievements. This is likely to reverse the tremendous recovery recorded

over the last 20 years with heavy financial investment by Government and donors.

- Genuine political commitment at all levels (village, ward, district) is necessary to check the situation. District staff and others in Kondoa Town should show an example by not allowing the cattle to graze freely. Over dependence on donor funds, lack of alternative livelihood systems and lack of community involvement from the early days of HADO were seen to be responsible for the current situation.

The Workshop concluded that:

- Sustainability of the achievements recorded by HADO and the creation of appropriate institutional arrangements/mechanisms to sustain these achievements were crucial and needed immediate attention by relevant authorities.
- Various technological innovations and coping mechanisms developed by the local people within the KEA during the life of the HADO Project need to be documented, described and enhanced, so that extension staff can be used to propagate them.
- There are many research issues (such as “carrying capacity” of the area) which need to be addressed in order to enhance the sustainability of the HADO achievements.

This is a study programme on the relationship between development policies, commercialisation of agriculture, social differentiation and population growth and the extent of soil erosion in the Kondoa Irangi Hills in semi-arid central Tanzania. Sida/SAREC funded this programme.

This programme came to an end in 2000.

Research Coordinator Dr. C. Mung'ong'o

3.2 Ongoing Research and Consultancy

3.2.1 Influence of Agricultural Land Use Changes on Peasant Production and Land Resource Management: The Case of Small Farm Holders in Usangu Plains – Tanzania

This is a Ph.D. study whose objectives are:

- i. To investigate on the nature of agricultural land use changes and its implication to farm labour use, accessibility to land and water resource management.
- ii. To examine the role of farm labour and its associated constraints in household agricultural production, land and water resource management.

- iii. To examine various livelihood strategies adopted by different households in relation to labour, land and water resource use and its implications to agricultural production.

The Ph.D. Study is almost coming into an end. Final corrections are currently being undertaken before submission, in October 2003

Researcher: Mr.J.G. Lyimo.

3.2.2 Pangani River Basin Research Programme

Background

This is a multidisciplinary research contributing towards integrated water resources management in the Pangani river basin. The project is supported by NORAD under the University of Dar es Salaam Agreement. The project is a continuing project from previous year and the budget allocated this year was T.sh 35,000,000.

The project has been extended support for the next tow years.

The Participating institutions are the Norwegian University of Science and Technology (NTNU) and The University of Dar es salaam. Participating departments /institutes from UDSM includes

- Civil engineering
- Geography dept
- IRA
- Botany Dept

Sister departments from Norway are also participating.

Objectives

The general objective is to establish sustainable integrated water resources management system in the Pangani basin in order to bring about socio economic development without compromising on ecological setting.

Specific objectives are:

- To develop research capacity of the staff of the University of Dar es Saalam
- To assess and analyse the existing water conflicts and recommend mechanisms for resolution

- To make disciplinary analyses of current and future trends on natural resources use in the basin including water
- To recommend sustainable integrated water resources management

Progress

A book was published by DUP with title: Water resources Management The case of Pangani river basin Issues and Approaches.

Other multidisciplinary research papers are also being published in various journals.

Researchers involved ; Ngana, J. O; Shishira, E.K and Yanda, P.

3. 2.3 Systems Research on Small Groundwater Retaining Structures under Local Management in Arid Areas of East Africa (REAL)

The objective of this research project is to enhance the participation of local communities in planning, construction and management of ground water structures (dams) for wildlife and livestock. The project is undertaken jointly with the Faculty of Engineering and DELFT University of the Netherlands Catholic University of Leuven, and University of Nairobi. The project involves local communities (livestock keepers and wildlife managers) in Kitendeni River, Arusha, and Amboseli National Park. The project is worth US\$47,639 and is funded by the European Union.

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

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

There are five objectives to this research project:

- 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 is 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 undertakes it.

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

3.2.5 Mainstreaming Environment into Poverty Reduction Strategy Process: The Role of Strategic Environmental Assessment

The objective of this consultancy is to determine experience to-date of Strategic Environmental Assessment (SEA) in Tanzania and outline the potential of SEA as a tool in poverty reduction and planning process at the sectoral and local government levels in Tanzania.

The project was commissioned by VPO/UNDP and is funded by DFID

Researcher: Prof. R. B. Mwalyosi and Adolf Mkenda

3.2.6 Establishment of Tarangire Information Centre (TIC)

This consultancy project has now been running for almost one and half years. During this period the following have been accomplished:

Development of Databases. The Tarangire/Manyara ecosystem database has been developed using Microsoft Access. The database contains the following modules:

- **Ecological** module – containing ecological monitoring data, including data from OIKOS project by Insituto OIKOS of Italy in collaboration with TANAPA.
- **Tourism** module – containing all data related to tourism including number of tourist and income generated, and
- **Anti-poaching** module – containing data from anti-poaching activities. This module also holds elephant carcass data being generated from the Elephant Project in Tarangire National Park.

Training. Staff from IRA have conducted two major training programs at the Tarangire Information Centre. The first involved Park Ecologists from all national parks in Tanzania. The two weeks introductory training focused on the application of GIS and Remote Sensing in the management of natural resources. The second training was specifically done to TANAPA staff based at the Tarangire

Information Centre. It is expected that the trained staff would manage the Center when the project expires in December 2003. In-house training has been going on continuously.

Geographical Information Systems (GIS). The TIC is progressively developing its own GIS database. There are now 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, Mr. S. Mwansasu and Ms. A. Mushi.

3.2.7 Coordination for the Policy Implementation Programme

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. The main objectives of this two-year assignment are as follows:

- To provide technical advise to the Wildlife Division and the Division of Environment on the implementation of the relevant policies.
- To work closely with stakeholders to ensure realization of the programme goals.
- To organize and supervise consultants needed to provide specialized input in the programme implementation.
- To be responsible for management of project funds, personnel and equipment and;
- To provide all technical reports to WWF Washington, USAID and other stakeholders.

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 2004.

Researcher: Dr. H. Sosovele

3.2.8 Indigenous Soil Fertility Restoration in Cashew Nut Producing Area of Southern Tanzania

The main agronomic problem facing cashew production in Mtwara and Lindi Regions of Southern Tanzania is the infestation of young leaves and flowers by a disease known as powdery mildew caused by the fungus *Oidium anacardii* Noak. One of the control strategies developed to combat the disease is dusting trees with elemental sulphur. This sulphur dusting is feared to cause severe land degradation through soil pollution.

The main purpose of this two-year study funded by Rockefeller Foundation at a tune of USD 33,991 is to maintain or increase cashewnut production under a situation whereby sulphur is used without altering drastically the properties of soils in the affected areas. The specific objectives are:

- to investigate in a participatory way the effects of incorporating groundnut, maize and goat FYM residues on the fertility of soils;
- to evaluate the properties of soils incorporated with groundnut, maize, and goat FYM residues dusted with two sulphur dusting regimes and;
- to identify and characterize other sources of organic residues which have potential in ameliorating soil acidity.

Progress achieved so far:

1. A Research paper "Declining Soil Fertility". A Challenge for Sustainable Productivity of land under cashew Farms, Southern areas of Tanzania has been re-submitted for publication in the Geographical Journal of Tanzania
2. MSc Dissertations by Jacob Omollo (SUA) "Effects of Organic Residues on Ameliorating Sulphur induced acidity in Cashewnut growing soil of Mtwara, Tanzania by been completed: Two papers are being developed.
3. On farm/on station evaluation of the interaction between sulphur/soils and organic residue types in progress specifically the collection of crop data and soil samples analysis in progress.

3.3 Future Research and Consultancy

3.3.1 Integrated Assessment of Regional Land-Climate Interactions

The objective of this research is to develop an approach that brings the analysis of the climate, ecological and human systems to temporal and spatial scales that communicate. The project will be undertaken jointly by the IRA and Geography Department (UDSM) and Michigan State University (USA). The project is worth

US\$ 800,000 and is approved for funding by the National Science Foundation of the USA.

3.3.2 Analysis of Land Use Dynamics and Land Degradation Process in the Great Rift Valley, Central Tanzania: A Case of Iramba District

The objectives of this research project are four-fold:

- Investigate agricultural development constraints and their socio-economic and environmental effects in the Kinampanda-Kitangiri Landscapes and propose possible solutions;
- Assess the environmental degradation process in the area and investigate the reasons for selected forest land encroachment and their effects
- Document and analyse the different land management practices and their contribution to agricultural sustainability
- Examine the different constraints to and opportunities for agricultural development and the related socio-economic implications.

The project has been approved for funding by OSSREA, and will take one year to complete.

3.3.3 Mapping of Selected Catchment Forests in Tanzania

This is a consultancy project to carry out digital aerial photography and ortho-photo map creation for selected catchment forests in Tanga, Morogoro and Kilimanjaro Regions, covering a total area of approximately 94,122 Hectares. The service has been requested by the Ministry of Natural Resources and Tourism. The Contract is for US\$ 124,000.

Researchers: Prof. Yanda, S. Mwansasu

3.3.4 Preparation of General Management Plans for Gombe and Mikumi National Parks.

This is a consultancy project involving writing a document and facilitating the preparation of a General Management Plan (GMP) and Strategic Environmental Assessment (SEA) for Gombe Stream National Park (GSNP) and Mikumi National Park (MNP). The project will start with preparation of GMP for Gombe, at a cost of approximately US\$60,000. A slightly higher amount would be spent on Mikumi National Park. Tanzania National Parks Authority commissions the consultancy.

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

3.3.5 Participatory planning in Mbozi and Sengerema Districts.

Documentation of the process and outputs completed. The work has been funded by UNDP.

Researcher: Prof. I. S. Kikula

3.3.6 Facilitating and editing of a document on issues and future research on the Kihansi toad.

This was done at the world bank office in Washington and was completed here and submitted to the Vice President's Office.

Researcher: Prof. I. S. Kikula

3.3.7 Visioning process of Lake Victoria

This work was commissioned by theWorld Bank and the East African Community. It was done in collaboration with a Norwegian Company called Statkraft Groner. The work is about to be completed.

Researcher: Prof. I. S. Kikula

4. PUBLICATIONS

At the time of this reporting, a total of 52 publications had been produced. They include 6 books, 5 chapters in books, 18 journal articles, and 23 research reports, consultancy reports and workshop proceedings, as indicated below.

4.1 Books

1. K.Kulindwa, O.Mashindano, F. Shechambo and H. Sosovele (2003) *Mining for Sustainable Development in Tanzania*, Dar es Salaam. DUP.
2. Shechambo, F. (with K. Kulindwa, H. Sosovele and O. Mashindano (2002). *Maendeleo Stahimilivu [Sustainable Development]*. Dar es Salaam: Dar es Salaam University Press.
3. Shechambo, Fanuel (with Edmund Barrow and Florence Chege) (2002), *Proceedings of the Second Directors of Conservation meeting 18-20 February 2002, Aberdare Country Club, Nyeri, Kenya*. Nairobi: IUCN.
4. Shechambo, Fanuel (with Barrow, Edmund and Florence Chege (2003), *Mainstreaming of the Environment in Kenya National Economic Development Planning and in Poverty Reduction Strategies*. Nairobi: IUCN.
5. Shechambo, F. (2003), *Valuing Forests: An Introductory Training Toolkit for Eastern Africa*. Nairobi: IUCN (Technical Report No. 21 GEF Cross Border Economics Project).
6. Madulu, N.F. and Mashauri, D.A. (eds.), (2002), *Integrated water supply and water demand for sustainable use of water resources, Proceedings of the 3rd Waternet/Warfa Symposium*, Dar es Salaam (30th-31st October 2002).

4.2 Chapters in Books

1. Madulu, N.F. (forthcoming), *Digging for a Living: Sukumaland Farming Traditions and Current Mining Pursuits in Tanzania*, In D. Bryceson (ed.), *How Africa Works: Occupational Change, Identity and Mortality in Africa* (Work in Progress - Submitted).
2. Madulu, N.F. (forthcoming), *Population Dynamics and Settlement Patterns*, In I. Kikula, C. Christiansson and C.G. Mung'ong'o, (eds.), *Fooling Around With People's Livelihoods: The case of Land Reclamation and Conservation Programmes in Central Tanzania*, (Work in Progress).

3. P.Z. Yanda & R.Y.M. Kangalawe (Forthcoming): *Land Cover, Tenure and Use Dynamics in The Kondo Irangi Hills*. In: Kikula et al. (eds.): *Fooling Around with People's Livelihoods – The case of Land Reclamation and Conservation Programmes in Central Tanzania*. MALISATA Monograph No. 1 (Chapter Seven).
4. E.K. Shishira & P.Z. Yanda (Forthcoming): *Landscape Evolution in the Kondo Irangi Hills, Central Tanzania*. In: Kikula et al. (eds.): *Fooling Around with People's Livelihoods – The case of Land Reclamation and Conservation Programmes in Central Tanzania*. MALISATA Monograph No. 1 (Chapter Three).
5. E.K. Shishira & P.Z. Yanda (Forthcoming): *Landscape Vulnerability in the Kondo Irangi Hills, Central Tanzania*. In: Kikula et al. (eds.): *Fooling Around with People's Livelihoods – The case of Land Reclamation and Conservation Programmes in Central Tanzania*. MALISATA Monograph No. 1 (Chapter Eight).

4.3 Journal Articles

1. Maganga, F.P. (2002) *"The Interplay Between Formal and Informal Systems of Managing Resource Conflicts: Some Evidence From South Western Tanzania"*, European Journal of Development Research, Vol. 14 No. 2 pp. 51-70.
2. Maganga, F.P. (2002) *"Between Customary and Statutory Systems – Striking the Right Balance in Integrated Water Resources Management"*, Den Ny Verden, 2002,4 pp. 54-70 (In Danish).
3. Maganga, F.P (2002).; J. Butterworth and P. Moriarty: *"Domestic Water Supply, Competition for Water Resources and IWRM in Tanzania: A Review and Discussion Paper"*, Physics and Chemistry of the Earth, 27: 919 – 926.
4. Sosovele, H. (2002). *The Administration of the EIA Process in Tanzania: Lessons for Practice*. African Journal of Environmental Assessment and Management. Vol. 4 No. 2, 2002; 1-15
5. Sosovele, H. Kulindwa, K (2003). *Adaptation and Change: Lessons from the Barabaig Pastoralist*. (Forthcoming) Tanzania Journal of Population Studies and Development.
6. Ngana, J.O; Mwalyosi, R.B.B; Madulu,N; Yanda,P. 2002. *Development of an*

integrated water resources management plan for the Lake Manyara Sub-Basin, Northern Tanzania .Journal of Physics and Chemistry of the Earth, p.1033-1038.

7. Shechambo, Fanuel (2003) " The Contribution of Mining to Local and national Economies of Tanzania and Attendant Environmental and Social costs". PANGEA Vol. 34 (forthcoming).
8. Madulu, N.F., Mashauri, D.A., Ngana, J.O. and Mudege, N. (eds.), (2003), Integrated water supply and water demand for sustainable use of water resources, Physics and Chemistry of the Earth, Vol. 28, Issues 20-27 , Pages 759-760
9. Madulu, N.F. (2003), *Linking Poverty Levels to Water Resource Use and Conflicts in Rural Tanzania*, Physics and Chemistry of the Earth, Vol. 28, Issues 20-27 .
10. Dungumaro, E.W. and Madulu, N.F. (2003), *Public Participation in Integrated Water Resources Management: The Case of Tanzania*, Physics and Chemistry of the Earth, Vol. 28, Issues 20-27 .
11. Madulu, N.F. (forthcoming), *Implications of Environmental Change on Modes of Life and Reproductive Behaviours in Tanzania*, Tanzanian Journal of Population Studies and Development, Vol. 6, Nos. 1& 2 (Paper Accepted for Publication).

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

1. Maganga, F.P. and R. Odgaard (2002) *Planning and Implementing Community Based Forest Management in Kilwa and Lindi Districts*, Report Prepared for Danida.
2. Maganga, F.P. (2002) *Planning Sustainable Livelihoods for Livestock Keepers in Morogoro Region*, Report Prepared for the Evangelical Lutheran Church of Tanzania, Morogoro Diocese.
3. Morris, M: J. Butterworth, R. Lamboll: F.P. Maganga E. Lazaro and N. Marsland (2002) *"Household Livelihood Strategies in Semi-Arid Tanzania: Synthesis of Findings"*, London, Department for International Development (DFID).

4. Maganga, F.P. (2002) *"Who is Indigenous? Contested Identities and Resource Conflicts in Morogoro Region, Tanzania"*, Paper Presented at a Seminar on Conflicts over Land and Water in Africa: Questions of Citizenship and Identity, Rungsted Kyst, Denmark, 28-29 November 2002.
5. Maganga, F.P.(2002) *"Incorporating Customary Laws in Implementation of IWRM: Some Insights from Rufiji River Basin, Tanzania"* Proceedings of the 3rd Waternet/WARFSA Symposium, Dar es Salaam, 30-31 October 2002, pp. 301 – 309.
6. Rasmussen, S.S.; S.D. Rasmussen; N.K. Pallangyo and F.P. Maganga (2002) *Beneficiary Assessment of MEMA (Natural Woodland Management Project and Udzungwa Mountains Forest Management Project)*, Copenhagen, Ministry of Foreign Affairs, Danida.
7. Liwenga, Emma: *Food Insecurity and Coping Strategies in Semi-arid Areas: The Case of Mvumi in Central Tanzania*. Stockholm Studies in Human Geography, Stockholm University. PhD Dissertation, No. 11. Almquist & Wiksell International. Stockholm, Sweden.
8. Shechambo, F. (with Moyini, Y, Muramira, E and Emerton L) (2002). *The Costs of Environmental Degradation and Loss to Uganda's Economy: With Particular Reference to Poverty Reduction*. Nairobi: IUCN- The World Conservation Union. (Policy Brief No.3)
9. Shechambo, F. (with Karanja, F. Chege, F. and Barrow, E.) (2002). *Natural Resource Valuation and Accounting in National Planning and Development in East Africa*. Nairobi: IUCN- The World Conservation Union. (Policy Brief No. 4).
10. Mariki, Stephen, W.; Shechambo Fanuel and Salehe, John (2003), *The Contribution of Environmental Goods and Services to Tanzania's Economy: With Reference to Poverty Reduction*. Nairobi: IUCN- The World Conservation Union (Policy Brief No. 5).
11. Madulu, N.F. (2003), *The Role of Gender in Natural Resource Management in the Lake Victoria Basin of Tanzania, Paper Presented at the RELMA Workshop on "Culture and Gender Roles in Natural Resource Conservation in the Lake Victoria Basin"*, Nairobi (6th-10th February, 2003).
12. Madulu, N.F. (2002), *Quality Improvement and Recognition Initiative: A Stakeholder Assessment*, Report to the MoH-RCHS, Dar es Salaam.

13. Madulu, N.F. (2002), *Rapid Assessment of Appropriate Strategies and Messages in Focus Areas*, Report to the MoH-RCHS, Dar es Salaam.
14. Melamari, L. Madulu, N.F. and Isinika, A. (2003), *Baseline Study in the Wami-Mbiki, Uyumbu, and Ipole Pilot WMAs in Morogoro, Mvomero, Bagamoyo, Urambo and Sikonge Districts, Volume 1: Methodological Report*, Wildlife Division, Ministry of Natural Resources and Tourism, Dar es Salaam.
15. Melamari, L. Madulu, N.F. and Isinika, A. (2003), *Baseline Study in the Wami-Mbiki Pilot WMA in Morogoro, Mvomero and Bagamoyo Districts, Volume 2: Wami-Mbiki Report*, Wildlife Division, Ministry of Natural Resources and Tourism, Dar es Salaam.
16. Melamari, L. Madulu, N.F. and Isinika, A. (2003), *Baseline Study in the Uyumbu Pilot WMA in Urambo District, Volume 3: Uyumbu Report*, Wildlife Division, Ministry of Natural Resources and Tourism, Dar es Salaam.
17. Shechambo, F. (2002). *Environmental Accounting, National Planning and Poverty Reduction: An Overview*. In: Proceedings of the East African Directors of Conservation and Economic Planning Meeting, 18-20 February 2002, Aberdares.
18. Melamari, L. Madulu, N.F. and Isinika, A. (2003), *Baseline Study in the Ipole Pilot WMA in Sikonge District, Volume 4: Ipole Report*, Wildlife Division, Ministry of Natural Resources and Tourism, Dar es Salaam.
19. Madulu, N.F. (2003), *Formative Assessment for the Design of Maternal Health Campaign in Tanzania*, Workshop Paper, Reproductive and Child Health Section, Ministry of Health, Dar es Salaam.
20. Madulu, N.F. (2003), *Safeguarding the Commons: Conflicts Over Natural Resource Use and Poverty Alleviation Strategies in Rural Tanzania*, Paper Presented at the Annual Ossrea Workshop, Dar es Salaam.
21. Yanda P.Z. and Madulu, N.F. (2003): *Natural Resources Use Patterns and Poverty Alleviation Strategies in the Highlands and Lowlands of Karatu and Monduli Districts: A Study on Linkages and Environmental Implications*. REPOA Research Report.
22. Yanda, P.Z., E.K. Shishira, N.F. Madulu and A.S. Kauzeni (2003): *Soil Erosion Hazard Mapping as a Basis for Identifying Priority Areas for Conservation in Lake Victoria Basin*. Paper Presented at LVEMP – Tanzania 2001 Scientific Conference Vol. 1:64-82: 299-318.

23. P.Z. Yanda and C.G. Mung'ong'o (2002: *Assessment of the Status of Proposed Extension and Establishment of New National Parks and the Surrounding Areas*. Report Submitted to TANAPA.
24. Mwalyosi, R.B.B. P.Z. Yanda, J.O. Ngana, C.G. Mung'ong'o and A.G. Mwakaje (2002): *Assessment of Needs for Wetlands Inventory and Tools for Assessing and Mapping Wetland Types and their Distribution*. Report Submitted to Wildlife Division, Ministry of Natural Resources and Tourism.
25. Ngana, J.O; Mwalyosi, R.B.B; Yanda,P; Madulu,N. 2003. *Strategic Development Plan for Integrated Water Resources Management in Lake Manyara sub basin, North - Eastern Tanzania*. Paper presented at the 4th WARFSA Syposium, Gaborone, Botswana, 15-17th October 2003.
26. Sosovele, H. Ngwale, J (2002. *Socio-Economic Root Cause Analysis of the Ruaha Catchment Area*. Report for WWF- Tanzania Programme Office. Dar es Salaam.
27. Sosovele, H. Mwalyosi, R B B and Mwakaje, A (2002). *Environmental Impact Assessment for the Establishment of Mobile telecommunication System in the Serengeti National Park and Ngorongoro Conservation Area, Tanzania*. Institute of Resource Assessment. Report for CELTEL Tanzania Ltd, Dar es Salaam.
28. Sosovele, H. (2003). *EIA Procedures and processes and entry points for legislation in Tanzania*. Paper presented to lawyers from various sectors on ILFEMP meeting in Bagamoyo, from 26- 30 May 2003.
29. Sosovele, H. *SEA and EIA Linkages in Tanzania for Development and Environmental Conservation*. Paper presented to a meeting on Integrating Environment into Poverty Reduction Strategy process. Held at White Sands Hotel, 26 June 2002 and organized by UNDP and VPO>

5. FINANCES

5.1 Sources of Funds

5.1.1 From Government

During the year 2001/2002, the Institute received a budgetary allocation of Tsh 12,720 from the Government through the University of Dar es Salaam to cover other charges, over and above personal emoluments. No funds were allocated for research.

5.1.2 From Own Sources

The Institute continued to generate funds from internal sources. These came mainly from consultancy services rendered. These services contributed approximately Tsh. 31.3 Million and US\$ 318,000. The figures are based on a 40% charge on professional fees from consultancies and public service work by its staff.

5.1.3 From Donors

Additional funds were provided by different donors in the form of grants for institute-wide research projects. These came through such projects as the Pangani Basin Water Management (NORAD), Man-Land Interrelationships (SIDA-Sarec), Sustainable Agriculture in Semi-rid Areas (DANIDA), Enhancing Research Capacity (DANIDA), Population Reference Bureau (USA), Water Research Fund for Southern Africa (WARFSA), Rockefeller Foundation and Eastern Africa Association for Impact Assessment (EAAIA). From all these programmes/projects, a total of TShs 91.3 Million and US \$ 623.4 Thousand was realized.

6 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 and Environment.
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, Assistant 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, Assistant 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

Key:

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

Box 2: List of Technical Staff

Francis A. Msuya, Chief Cartographer, Diploma in Cartography (ITC - Netherlands).

Stephen K. Kajula, Principal 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).

Anna Mushi, Cartographic Technician, GIS (Trondheim, Norway), Diploma in Cartography (Horsens Polytechnic, Denmark).

Chrisant Msonganzila, Senior Field Officer, Dip. Crop. Production (Uyole).

Augustine J. Yonah, Senior Field Officer, Certificate in Social Work, ISW (Dar).

Evod B. Ulaya, Field Officer I, Certificate in Rural Development Planning (IRDP Dodoma).

Alexander Mnyenyelwa, Artisan, FTC (Arusha Tech. College).

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. **Victor Makero, Assistant Supplies Officer, NCC, NBMM, ATEC 1.**
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.**
9. **Hamisi Abdulrahman, Security Guard.**
10. **Salama Sia, Security Guard**

Key:

- * **On study leave**
- ** **On secondment**
- *** **On Contract**