

**INSTITUTE OF RESOURCE ASSESSMENT
UNIVERSITY OF DAR ES SALAAM**



Annual Report

July 2001 – June 2002

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STRATEGIC OBJECTIVES OF THE INSTITUTE

The strategic objectives of the Institute of Resource Assessment are the following:

- **Enhance national and international status of the University of Dar es Salaam through quality research outputs**
- **Improve work performance of the Institute**
- **Improve services on Sustainable Natural Resource Management**
- **Enhance integrated and sustainable Natural Resource Management in the country.**

1. BACKGROUND

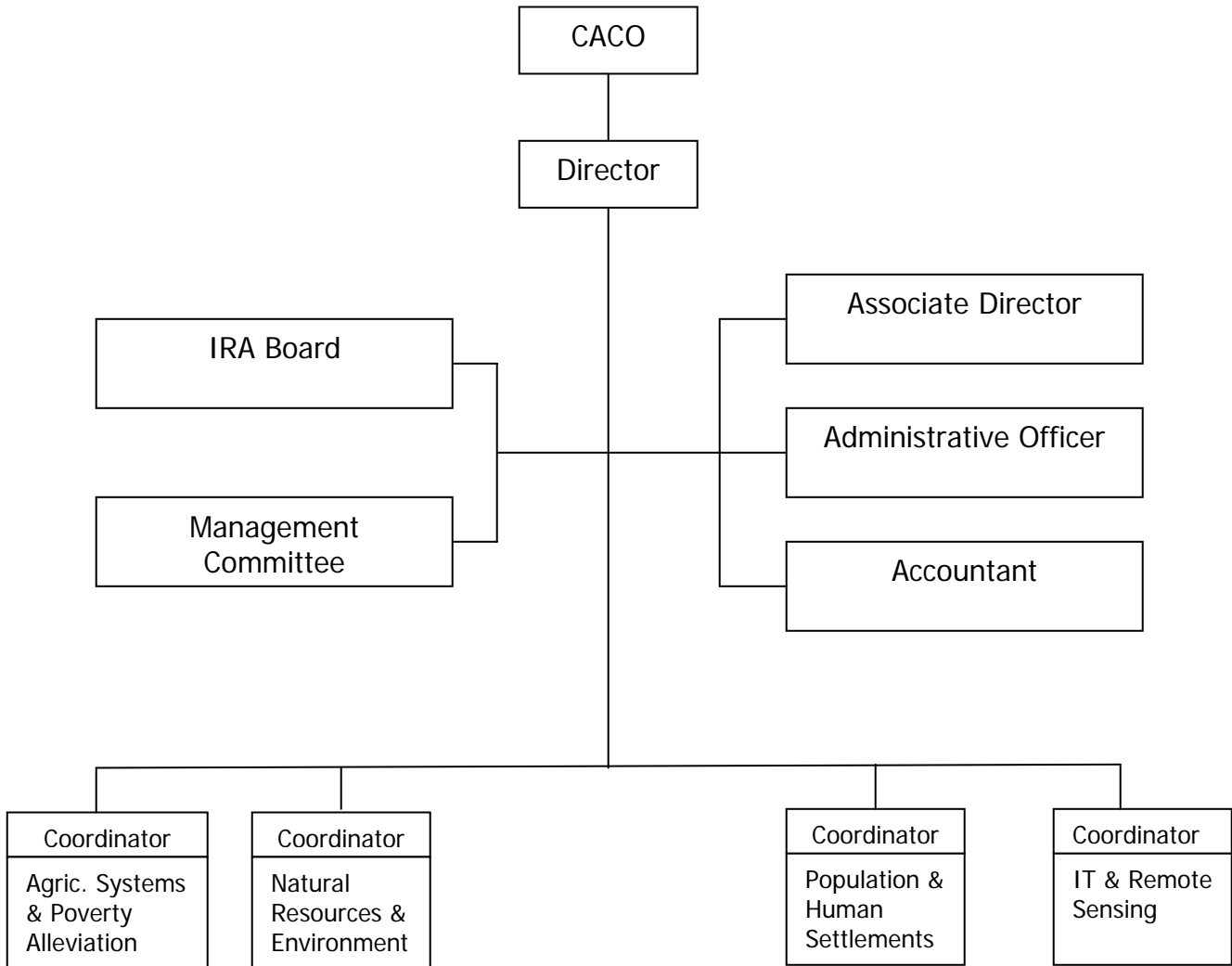
The Institute of Resource Assessment (IRA) formerly Bureau of Resource Assessment and Land Use Planning (BRALUP) was established in 1967 as an applied research wing within the University of Dar Es Salaam to support the government in planning and assessment of both human and natural resources. In July 1982 BRALUP was elevated to an Institute of the University of Dar Es Salaam. The Institute was established in accordance with the University of Dar Es Salaam Act of 1970. The Institute is both a multidisciplinary and an interdisciplinary research organization within the University of Dar Es Salaam.

BRALUP and later the Institute was established to address a range of issues related to resource management in Tanzania. The overall objective was to address the whole question of sustainable development. The specific objectives vary depending on the socio-economic circumstances in Tanzania. The current specific objectives of the Institute, therefore, are the following: -

- To carry out research and develop research capacities pertinent to the social, cultural, environmental and economic development of Tanzania
- To organise and assist research activities carried out by the staff of the Bureau and staff from other departments in related fields in the University of Dar es Salaam
- To co-ordinate and assist research carried out by staff seconded from government, research fellows from other research institutions and other visiting research workers
- To furnish advice, upon request, to the government, public and other organisations
- To arrange conferences, seminars or postgraduate courses on natural resources and land use-planning matters
- To collect information necessary for the research activities of the Institute
- To contribute to the training of Tanzania research staff within the areas of its competence and to provide specialised teaching materials for the University of Dar es Salaam and other related institutions.

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 Institute is managed by the Director who reports to the Chief Academic Officer (CACO) and is an Appointee of the University Council. 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 exploit the fertile treasure of ideas from stakeholder groups in the Institute.

The Office of the Director is also equipped with “generic tools” viz. Associate Director, Administrative Officer, and Accountant to help the Director with routine 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 co-ordinators that also form the Management Committee. These are principal advisors to the Director and are responsible for planning and reviewing the institutes research activities. The Management Committee may also co-opt other staff when necessary and include a representative from the non-academic staff.

3. MANAGEMENT AND ADMINISTRATION

3.1 Management Committee

Name	Position
Prof. R.B.B. Mwalyosi	Director
Dr. Hussein 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 Anna Mushi	Tanzania Natural Resources Information Centre & GIS
Prof. Pius Yanda	Co-coordinator, Remote Sensing and Information Systems
Ms E. Masha	Administrative Officer

3.2 Staff Matters

During the academic year 2001/2002 the number of staff members was reduced from 38 reported in 2000/2001, to 37. This was due to the tragic death of one of the Institute's dedicated field officers, Mr. Abel Kapele. Of the 37 members, 19 were academic, 7 were technical, and 11 were administrative. The three retiree academic members of staff, i.e. Prof. Mascarenhas, Prof. Kauzeni and Prof. Mujwahuzi continued to work on contract during the period. Dr. Shechambo took a sabbatical leave to work at IUCN in Nairobi.

Dr. Kangalawe successfully defended his PhD at the University of Stockholm and rejoined the Institute. Ms. E. Liwenga continued to pursue her sandwich doctoral programme at Stockholm University, while Ms. Kiwasila and Mr. Lyimo spent most of their time at the Institute, finalising their dissertations. Boxes 1, 2 and 3 illustrate the staffing position of IRA while Box 4 gives the list of Board Members of the Institute during the year under review.

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. **Adolfo C. Mascarenhas, Professor**, BA (London), Dip. Ed. (E.A.), M.A. Ph.D. (UCLA). Agricultural Development, Regional Planning, Environment and Development, Food Systems. ****
6. **Athanas S. Kauzeni, Professor**, Dip. Agric., Postgraduate Dip. Agric. Extension (Reading), B.Sc. Agric., M.Sc. (West Virginia), Ph.D. Agricultural Extension, Rural Development and Rural Water Supply. ****
7. **Idris S. Kikula, Professor**, B.Sc. Hons; M.Sc. (Dar) Ph.D. (Griffith) Land Resource Management, Environment and Remote Sensing. **
8. **Mark R. Mujwahuzi, Associate Professor**, BA (E.A), M.A., Ph.D. (Clark) Water Management. ****
9. **James O. Ngana, Associate Professor**, B.Sc. Hon.; M.Sc. (Dar), M.Sc. (Galway), Ph.D. (KTH, Stockholm) Water Resources and Environment.
10. **Pius Z. Yanda, Associate Professor**, B.Sc., Hons; (Dar), Dip. MNRSA; M.Sc. (AUN) , Ph.D. (Stockholm) Environment, Water Resource Development.
11. **Fanuel C. Shechambo, Senior Research Fellow**, Dip. Lib. (Makerere), BA, Hons; M.A. (Econ.) (Dar), Dr.sc.agr. (TU Berlin) Agricultural and Resource Economics. ***

12. **Faustin P. Maganga, Senior Research Fellow**, BA Hons; M.A. (Dar), M.Sc. (Zimbabwe), Ph.D. (Roskilde) Institutional Aspects of Natural Resource Management.
13. **Claude G.M. Mung'ong'o, Senior Research Fellow**, Dip. Lib. (Makerere), B.A. Hons (Dar), M.A. (Dar), Ph.D. (Stockholm). Environmental Sociology.
14. **Amos Enock Majule, Research Fellow**, B.Sc. Agric. Hons (SUA), Ph.D. (Reading) Environment, Soil Fertility and Conservation.
15. **Agnes Mwakaje, Research Fellow**, B.Sc. Agric. Hons (SUA); M.Sc. Agric. Economics (Reading) Ph.D. Agric. Economics (London)
16. **Hildegard L. Kiwasila, Research Fellow**, BA Hons (Dar) M.P.H. (North Carolina) PGWSST (Loughborough) Sociology, Public Health. *
17. **Richard Y.M. Kangalawe, Assistant Research Fellow**, Dip. Crop Prod. (Uyole), B.Sc. Agric. (SUA), M.Sc. (AUN), PhD (Stockholm).
18. **James G. Lyimo, Assistant Research Fellow**, B.Sc. Agric. (SUA), PGDIP. MNRSA, M.Sc., (AUN) Natural Resource Management. *
19. **Emma T. Liwenga, Assistant Research Fellow**, Dip.Crop Prod. (Uyole), B.Sc. Agric. (SUA), M.Sc. (AUN).*

Key:

* **On study leave**

** **On secondment**

*** **On sabbatical leave**

**** **On contract**

Box 2: List of Technical Staff

1. **Francis A. Msuya, Chief Cartographer**, Diploma in Cartography (ITC - Netherlands).
2. **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).
3. **Simon Mwansasu, Senior Field Officer**, Visual C++ Programming (QA, UK), B.Sc. Hons; M.Sc. (Pinar Del Rio,Cuba). Forest Engineering .
4. **Anna Mushi, Cartographic Technician**, GIS (Trondheim, Norway), Diploma in Cartography (Horsens Polytechnic, Denmark).
5. **Chrisant Msonganzila, Senior Field Officer**, Dip. Crop. Production (Uyole).
6. **Augustine J. Yonah, Senior Field Officer**, Certificate in Social Work, ISW (Dar).
7. **Evod B. Ulaya, Field Officer I**, Certificate in Rural Development Planning (IRDP Dodoma).

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. **Alexander Mnyenyelwa, Artisan**, FTC (Arusha Tech. College).
9. **Bruno Mwano, Driver**.
10. **Hamisi Abdulrahman, Security Guard**.
11. **Salama Sia, Security Guard**.

Key:

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

Box 4: List of IRA Board Members (2000/2001 – 2002/2003)

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. J.O. Ngana**, IRA
14. **Dr. H. Sosovele**, IRA
15. **Prof. N.F. Madulu**, IRA
16. **Prof. P.Z. Yanda**, IRA
17. **Mr. S. Kajula**, IRA

4. Staff Development

Staff development continued for both academic and administrative staff. The following table shows IRA staff members on doctoral programmes.

Name	Level	Status	University
Ms. H. Kiwasila	Ph.D.	In final stages	University College, London
Ms. E. Liwenga	Ph.D.	In final stages	Stockholm University
Mr. G. Lyimo	Ph.D.	In final stages	University of Copenhagen

During the year under review, one of the administrative staff, Peter Damson attended a one month basic computer course at the University Computing Centre.

5. Highlights of Key Achievements

5.1.1 Links and Collaboration

The Institute continued to strengthen existing formal links with various local and international organizations, while expanding horizons to build new ones. An important international link in research, training and capacity building is with the School of Geography, University of Stockholm. The MALISATA research programme and one doctoral programme was completed, while another continued during the reporting period.

Another important international link with the Centre for Environment and Development of the Norwegian University of Science and Technology (NTNU) continued through the Pangani Basin Programme. In this programme, IRA collaborates with the Departments of Geography and Civil Engineering of the University of Dar Es Salaam and the Ministry of Water. Further, collaborative activities continued with the Institute of Geography, University of Copenhagen, under the Sustainable Agriculture in Semi-Arid Areas – SASA programme and one doctoral programme.

Other collaborative research continued to be strengthened with several other international institutions, including: 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); Rockefeller Foundation 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); the African Wildlife Foundation (AWF) of Nairobi; World Wildlife Fund for Nature (WWF); Eastern Africa Association for Impact Assessment (EAAIA).

Within Tanzania, collaborative research also continues with the Institute of Development Studies, Economic Research Bureau, Faculty of Science, Faculty of Engineering and Faculty of Law of the University of Dar Es Salaam. Public service contacts are 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 include National Environment Management Council (NEMC) and the National Land Use Commission (NLUPC).

5.1.2 Sources of Funds

- **From Government**

During the year 2001/2002, the Institute continued to receive budgetary allocation from the Government through the University of Dar es Salaam to cover personal emoluments and other charges. However, the funds allocated for other charges were not sufficient to run the day to day activities of the Institute.

- **From Own Sources**

The Institute has continued to generate funds from internal sources. These came mainly from consultancy services rendered. The Institute charges 40% of professional fees from all consultancies and public service work by its staff. This is above the 25% stipulated by the University Consultancy Bureau. Income from sale of publications and printing services is still very insignificant. Major rehabilitation and reorganization of printing services is required before this source can be profitably tapped.

- **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 Interrelationship (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).

5.2 Development of Physical Infrastructure

5.2.1 Library Services and Documentation Unit

During the 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 has being 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 computerisation of our documentation unit continued. Software such as MARC, Papyrus and DataBase programmes have been installed.

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

5.2.2 Computer and Related Facilities

Accessibility to computer facilities is vital for efficient handling and processing of data/information. The Institute has therefore made substantial 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 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 *Deskjet 890C*. There are more printers compared to the previous year. Out of fifteen printers, three are colour printers and one of them can use both A1 and A3 paper.

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

1.7.3 Printing Services

The Institute has a Printing Unit. The objectives of establishing the Unit were two-fold:

- to print various Institute's reports and journals,
- to generate income for the Institute through printing publications from other clients within and outside the University.

The first objective has been more or less realized. The second objective has not been adequately realized due to a number of problems, including inadequate marketing within and outside the University. There is need to reactivate the Unit in the light of increased competition from several units in the University and Dar es Salaam in general.

5.2.3 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 computerised 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.

6. TRAINING AND TECHNICAL SERVICES

6.1 Short-Term Training

The Institute conducted two short-term training courses:

6.1.1 Communicating Environmental Research to Policy Makers

In collaboration with the Population Reference Bureau, the IRA conducted an international, two-week policy communication workshop for participants from all-over Africa. The objective of the workshop was to train participants how to maximise 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 graphics programme.

This training workshop will now be an annual event and will be largely organised and conducted by the Institute, having trained its own trainers through the support from the Population Reference Bureau (USA).

Researchers involved: Dr. H. Sosovele; Prof. N. Madulu and Ms. H. Kiwasila.

6.1.2 Programmatic Environmental Assessment (PEA) Training

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

- To enable planning and conservation staff of Tanzania National Parks (TANAPA) within individual parks to understand and apply the PEA process when they implement any activity related to road construction/improvement programme. The PEA process stresses and proposes ways of taking into account the environmental implications arising from those activities and applying mitigation measures for negative impacts and enhancement measures for positive ones.

- To test in the field, the applicability and relevance of PEA methodology, guidelines and environmental review procedures thereby assessing whether there are deficiencies that may need improvement and/ or modifications.

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 PEA process, they could ensure its applicability at the Park level.

A total of 25 participants from TANAPA attended the course, and the majority of them commented it as very useful and relevant for addressing environmental problems resulting from their road improvement programmes. They also expressed satisfaction with respect to course presentation, content and material.

Researchers: Dr. H. Sosovele and Dr. A.G. Mwakaje.

6.2 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) Dr. Mung'ong'o continued as local supervisor for Mr. E. Dembe of TANAPA who is undergoing Ph.D. studies at the International Centre for Protected Landscapes, University of Wales, Aberystwyth, UK.
- b) Dr. Mung'ong'o also continued to act as local supervisor for Ms. Emma Raymond who is doing Ph.D. studies at the Department of Human Geography, Stockholm University, Sweden.
- c) Dr. Maganga supervised Mr. Raphael Burra, M.A. (GEM), University of Dar es Salaam.
- d) Dr. Maganga acted as local supervisor for Ms. Susanna Thulin who is undergoing M.A. studies at the University of Lund.
- e) Dr. Maganga acted as local supervisor for Mr. Abdalla Shah, Masters Student (Environmental Management), Yale University.
- f) Prof. Ngana supervised Ms. Amani Aimtonga, M.A. (GEM), University of Dar es Salaam.
- g) Dr. Sosovele supervised Ms. Beatrice Mchome M.A. (GEM), University of Dar es Salaam.

- h) Drs. Sosovele, Mung'ong'o and Maganga taught the M.A Course GE618 (Management and Conservation of Environmental Resources) at the Department of Geography, UDSM.
- i) Dr. Majule taught GE 121 (Climatology, Biogeography and Soils); and GE 210 (Soil Resources).
- j) Dr. Mwakaje taught GE 211 (Agricultural Planning and policies).
- k)

6.3 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 were taking place inside and outside Tanzania. .

6.4 Establishment of Tarangire Information Centrer

During the reporting period, the IRA was contacted by Tanzania National Parks (TANAPA) to establish a database and Information Centre at Tarangire National Park Headquarters. The objectives of this project are:

- To facilitate the establishment of an information centre at the Tarangire National Park Headquarters,
- To establish user-friendly data bases at the Information Centre,
- To provide GIS training to selected TANAPA staff.

This work is still in progress and the Institute has sub-contacted a GIS specialist who is located at Tarangire on full-time bases until the project is accomplished.

Staff Involved: Prof. Yanda, Mr. Mwansasu and Ms. Mushi.

7. RESEARCH AND CONSULTANCY

6.1 Completed Research Programmes/Projects

6.1.1 Social Impact Assessment of the Gazettement of Derema Forest, East Usambara (ANR).

The purpose of conserving the East Usambara forests is to conserve water catchment areas, to provide forest products to local communities and to maintain the biological diversity of these unique mountains. The East Usambara forests are, for their size, biologically the richest sites and contain the greatest number of endemic plant and animal species of any site in East Africa. These forests also have the highest known ration of endemic plant and animal species to area of any site in the world. However, the East Usambara forests are fragmented into ten blocks of forests. As such, none of these fragments are large enough to support long-term viable populations for many of the globally rare and endemic vertebrate species occurring here. Also many of these species will not cross-gaps in the forest wider than a few hundred meters in width. Fragmentation of the forest is a threat for many forest dependent species. Population of some of the birds in East Usambara is decreasing due to this problem.

This problem was realized many years ago and the Gazettement of the Derema forest was proposed in early 1970s. The area was surveyed but the borders were not demarcated. Compensation to some farmers cultivating cardamom inside the forest could not be agreed upon and the project was shelved until more funds for compensation were made available.

The East Usambara Catchment Forest Management Project (EUCAMP) has initiated a Social Impact Assessment (SIA) of the Gazettement of the Derema forest. This project aims at connecting the Derema Forest to the ANR in the south through a corridor and the Kambai Forest Reserve in the north, through another corridor. Over 50 % of cardamom are cultivated inside the forest. Five villages with a total population of about 10,000 live in proximity to the Derema forest and depend of this forest for their livelihood. A SIA will identify impacts and propose mitigation measures.

The study suggested the following options:

- The project should inform all the affected villagers about the gazettement exercise and how this will affect their livelihoods

- All the affected farmers must be identified and their property carefully identified and quantified for proper valuation. Records must be kept in the village offices, the District and the project.
- The process of valuation must be transparent and participatory.
- Compensation must follow immediately after evaluation and gazettement and must be timely and fair
- Compensation rates must be adjusted to take into account the investment that farmers have put in the crops and properties that will be affected
- Compensation money must be paid to the affected villagers through the bank and gazettement should follow once money for compensation has been secured
- Voluntary resettlement must be encouraged but also supported by provision of basic services and adequate land for continuation of economic activities of the affected villagers
- A monitoring exercise must be carried out to check out on the effect of the gazettement and address unexpected effects.

The Project is now implementing most of the suggestions as it sets out to compensate local communities around the proposed forest reserves.

Researchers: Dr. H. Sosovele and Dr. G. Jambiya (Geography Dept).

6.1.2 Kihansi Area Conservation Plan

Tanzania Electric Supply Ltd (TANESCO) has signed a contract with NORPLAN A.S. for the implementation of the project "Immediate Rescue and Emergency Measures" for the Lower Kihansi Hydropower Project (LKHP), financed by NORAD and SIDA. In turn, NORPLAN subcontracted IRA to prepare an area conservation plan for the Kihansi Immediate Catchment Area.

This was a USD 64,000 consultancy project whose major objectives were:

- To ensure long-term environmental sustainability of the area and conservation of natural resources;
- To secure hydrology and LKHP infrastructure;
- To maximise benefits to and participation of local population in the LKHP
- To resolve potential conflicts related to natural resource use in the area.

The area conservation plan was developed, and an institutional framework for managing the conservation area proposed, including a step-wise legislation process for the conservation area and sources of funding for the conservation plan. The project was successfully completed and the report submitted to NORPLAN and accepted by the Government.

Researchers: Prof. A. S. Kauzeni, Prof. R. B.B. Mwalyosi, Prof. P. Yanda, Prof. E.K. Shishira, Dr. C.G. Mung'ong'o, Dr. F.P. Maganga and Dr. A. Majule

6.1.3 MEMA Beneficiary Assessment

In June 1999 implementation of Danida supported forestry and biodiversity projects began in Iringa District, with the two jointly managed projects under the name MEMA: (a) Udzungwa Mountains Forest Management and Biodiversity Conservation Project (UMFM); and (b) Community Based Natural Woodlands Management Project (NWMP).

The objective of the Beneficiary Assessment was to assist the managers and users of the project at all levels to get a deeper understanding of the processes involved and how these are perceived by institutions and users at all levels involved in planning and implementing participatory forest management (PFM). The Beneficiary Assessment aimed to providing the project management with information directly linked to improving management of decisions and thereby implementation of the project.

The project was ha induced a major change in the way foresters operate and are perceived in Iringa District. The project has made foresters work for and with communities. Participatory Forest Management (PFM) Plans have been developed in all involved villages and all interviewed staff appear to be aware that implementation of the PFM Plans will be crucial to the success of the project. So far, the project has not achieved much impact on the ground in terms of forest conservation, sustainable forest utilisation or poverty alleviation.

Researchers: Dr. F.P. Maganga, in Association with COWI A/S

6.1.4 Mobile Phone Network Installation in Serengeti National Park and Ngorongoro Conservation Area

In this USD 11,450 consultancy project, CELTEL planned to establish communication infrastructure at three sites in Serengeti NP and one in the Ngorongoro Conservation Area.

The objectives of the EIA were the following:

- Assessment of impact associated with the development of telecommunication towers and related infrastructure including: design, site selection, supply of construction material, construction, waste disposal, employee safety and training

- Assessment of impacts of established infrastructure on wildlife and their habitats, with particular emphasis on short term and long term impacts as well as direct and indirect impacts on sensitive habitats
- Identification of the concerns and interests of key stakeholders in the project, especially TANAPA, NCAA, tour operators, hoteliers, tourists and academics
- Assessment of compatibility of project elements to existing national and sectoral policies and laws, as well as international conventions.

The study observed that the proposed development would cause significant negative impacts (some of which are not mitigable) that could lead to severe degradation of resources and tourist products in the Serengeti. The EIA team concluded that the establishment of communication towers will compromise park objectives, national and sectoral policies as well as international conventions, and the adverse impacts will far outweigh the benefits.

In NCA the study observed that the establishment of GSM network at Rhino Lodge site will not have major adverse impacts on the crater rim, but will have significant adverse impacts if communication signals are beamed to the crater. The EIA study recommended that improving the existing communication facilities so as to continue providing communication services to the tourists and the residents of Serengeti and Ngorongoro without erecting new towers is more plausible. However, it was cautioned that care must be exercised to ensure that expansion of TTCL and radio communication does not severely affect the integrity of tourism and conservation in these areas.

Researchers: Prof. R.B.B. Mwalyosi, Dr. H. Sosovele and Dr. A. Mwakaje

6.1.5 Baseline Survey for Malagarasi Wetland Ecosystem

The Malagarasi-Muyovozi wetlands present one of the most important wetland ecosystems in Eastern and Southern Africa. These wetlands have been dedicated as Ramsar Site of Tanzania. There are a number of potential threats to the Malagarasi-Muyovozi Ramsar Site. The main threats include conversion of wetland areas into farmland and associated land degradation related to the cultivation of tobacco. Other threats are extensive burning of grasslands, conversion of papyrus swamp to cultivated land, and illicit harvesting of forest products, wildlife resources and fish.

The objectives of this study were:

- to provide baseline information for the formulation of project activities in the pilot areas of the Ramsar Site, around Lake Sagara and Lake Nyamagoma;
- to provide baseline information for the future monitoring of ecological and socio-economic changes in the pilot areas and;
- to assess the existing information base for the whole of the Ramsar Site.

The study has demonstrated that there is a serious uncontrolled immigration in the study area, especially by the Sukuma searching for arable and grazing land. This process is aggravating the problem of deforestation and overgrazing. This has been facilitated by laxity in local administration at all levels.

The study has also shown that there is serious lack of data/information. The little information available is inconsistent and unreliable. The inconsistency is mainly due to the fact that the study area falls under several administrative units which have been collecting data using different formats and frequencies. Such data is difficult to be harmonised and compared.

This was a USD 64,000 consultancy project contracted to the Institute by the Wildlife Department. The objectives of this study were:

Researchers involved: Prof. Yanda, Prof. Ngana and Dr. Mung'ong'o.

6.1.6 Guidelines for Participatory Planning for District Agricultural Development in Tanzania

The objective of this project was to provide guidelines for participatory planning for district agricultural development in Tanzania. This was done by reviewing a number of complementary guidelines from different sources and field visits. The reviewed documents included the following:

- The draft National Guidelines for participatory Planning by the President's Office Regional Administration and Local Government (PO-RALG).
- The draft Training Manual on Participatory Community Based Opportunities and Obstacles for Development Planning (O&OD) by PO-RALG (2001) which

provided operational details of the different steps that are outlined in these guidelines.

- The draft guidelines for preparation and implementation of community agricultural development sub-projects by Participatory Agricultural Development and Empowerment Project, PADEP (2002), Ministry of Agriculture and Food Security (MAFS).
- The Reflection of Tanzakesho Programme (UNDP 2001)

Field visits were undertaken in Hai District, where the O&OD methodology is being tried out, and in Kisarawe District, where no participatory planning practices are being practised. The guidelines have been formulated and submitted to the Ministry of agriculture and Food Security.

Researchers: Prof. I.S. Kikula; Dr. A. Mwakaje and A. Macpharson

6.1.7 Survey and Mapping of Land Use/Cover and Erosion Hazard in the Lake Victoria Basin

The main objective of the study was to identify present degraded areas which are potentially vulnerable to soil erosion for immediate intervention. It has been realised that soil erosion is one of the main processes of land degradation which lead to depletion of soil nutrients in agricultural land, and degradation of wetlands through siltation and sediment deposition.

The specific objectives were:

- To map the current status of different land use/cover types
- To examine factors contributing to the present land use types and the associated environmental degradation processes
- To map erosion hazard areas in the basin.

The study has provided the spatial extent and magnitude of the soil erosion in the basin and identified priority areas for immediate interventions. It has also examined the main factors that have contributed to the present land use practices, and the associating environmental degradation processes, and mapped erosion hazard in the basin. The report proposes various mitigation measures that can be implemented to minimise the risks of soil erosion in the basin.

Findings from this study indicates that the influence of soil degradation factors to the actual or potential degradation varies from place to place. Thus, there are areas where degree of slope is the major factor while in other areas soil physical

characteristics was seen to be the major factor. Such variations necessitate varying amelioration strategies and approaches in studying or accessing soil erosion hazards.

This consultancy project was commissioned by the Lake Victoria Environmental Management Project to the tune of USD 40,000.

6.2 Ongoing Research Programmes/Projects

The following programmes/projects are still ongoing:

6.2.1 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 study is funded by DANIDA

Researcher: Mr. J.G. Lyimo.

6.2.2 Pangani River Basin Research Programme

Socio-economic developments in Pangani basin are growing fast, particularly upstream of Nyumba ya Mungu. These activities put pressure on the limited water sources in the basin. In the slopes of these mountains there is coffee and banana growing as well as zero grazing. In the lowlands of Arusha, flower growing is mushrooming as well. Further down in the Kilimanjaro lowlands there are several irrigated acres of paddy. Also there is urban migration to Moshi and Arusha towns putting pressure on domestic water supply. The limited rivers draining the two towns are constantly being polluted by various industries. Further downstream water is required by hydropower generation plants at Nyumba ya Mungu, Hale and Pangani. The cumulative impacts of the above

socio-economic activities on the limited water sources are significant.

Therefore, the objectives of the study are:

- to establish sustainable water management systems in the basin
- to develop research capacity of staff of UDSM and NTNU

The first phase of the study concentrated on the upstream of NYM. In the second phase the study has been extended to downstream of NYM.

This joint research programme involves 16 researchers from the University of Dar Es Salaam (IRA, Geography and IRA) and the University of Trondheim and is being funded by NORAD.

6.2.3 Integrated Water Resources Management in Lake Manyara Sub-Basin

Water resource management in Lake Manyara Sub-basin is an issue of very high significance as it hosts a number of national and global assets of great socio-cultural, ecological and economic value. The sub-basin comprises a Biosphere Reserve with boosting tourism from Lake Manyara National Park with a variety of wildlife population, large livestock population and highly fertile land for agricultural production. Currently water resource management in the basin is uncoordinated and thus cannot sustain the ever increasing needs of the various expanding sectors.

This study seeks to establish a strategy for integrating the various sectoral needs against the available water resources in order to attain both economic and ecological sustainability. The specific objectives of the study are:

- to establish the existing water resources in the sub-basin;
- to establish current and future water needs in the basin;
- to develop water balance between supply and demand for present and future and;
- to develop an integrated water resource management plan through participatory approaches.

The project is funded by the Water Research Fund for Southern Africa (WARFSA) at a tune of USD 35,450.

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

6.2.4 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 study 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 characterise other sources of organic residues which have potential in ameliorating soil acidity.

This is a two-year study funded by Rockefeller Foundation at a tune of USD 33,991.

Researchers: Dr. A. Majule, Prof. E.K. Shishira, and Prof. P. Yanda

6.2.5 Resource Poor Environment and Poverty Alleviation in Mbinga District

The objectives of this project are:

- To assess the performance of the *ngoro* and the *malonga* systems of conserving soils in the Matengo hills,
- To enumerate the different coping strategies adopted by the Matengo people in poverty alleviation,
- To establish socio-economic motives behind the introduction of the *malonga* system and how these motives are linked to poverty as compared to the *ngoro* system

This is a two-year project funded through REPOA to a tune of USD 18,600.

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

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

Four areas are proposed to be either new national parks or extensions of the existing ones. The proposed new parks are Saadani (Bagamoyo District) and Kitulo Plateau (in Makete District). Areas proposed for annexation to existing parks are Mount Meru and Ngurdoto Forest Reserves (Arumeru District) and Kilimanjaro Forest Reserve (Moshi Rural/Rombo/Hai Districts). While Mount Meru/Ngurdoto FR will be annexed to Arusha National Park, Kilimanjaro FR will be added to Kilimanjaro National Park.

Tanzania National Parks (TANAPA) contracted the IRA to assess the status of the proposed areas and conduct a SWOT analysis to establish new and/or extend the existing national parks. The study was set for three months and would cost USD 40,000. The specific objectives of this project are:

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

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

6.2.7 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 is financed under the Environment, Peace and Stability Fund (EPSF). During the first phase UTUMI is being implemented in Kilwa and Lindi Districts, but as the time perspective for UTUMI is expected to be 15-20 years it is envisaged that all the districts in the region will become involved in the project during the course of this period.

Due to the large variations in socio-economic, cultural and agro-ecological conditions within and between the various districts of Lindi Region, it was recommended in the UTUMI Project Document, that socio-economic and biological studies should be conducted prior to selection of project sites and upstart of project activities, to ensure that planning and implementation of the projects is based on proper understanding of the local context.

As a follow-up on the recommendation in the Project Document Danida commissioned biodiversity and socio-economic studies by external study teams. Dr. F. Maganga from IRA participated in these studies.

Researcher: Dr. F. P. Maganga

6.2.8 Crop-Livestock Integration in Irrigated Farming Systems as a Strategy for Sustainable Resource Management and Conflict Resolution

The Usangu Basin (UB) is one of the areas of high potential for irrigation development in South Western Tanzania. As a result, the basin has attracted both farmers and pastoralists from different parts of the country. Thus, there has been a rapid expansion in area for rain-fed, irrigated crops cultivation and livestock land for grazing. Consequently, there is a growing competition for resource use (land and water) between crop farming and livestock development. This has made the relationship between farming systems in UB a subject of growing interest.

While in most cases resource use and management associated with the livestock and crop farming systems have been seen as conflicting and therefore the conventional wisdom has been to separate the two, this study attempts to consider integration rather than isolation of the two farming systems.

The objectives of this project therefore are as follows:

- to identify the extent of and variation in integration of crop and livestock in the Usangu farming systems;
- to study the potentials for greater livestock-crop integration the area;
- to identify mechanisms for integration or exclusion of livestock needs among various development projects/ schemes that operate in the area;
- to study household coping strategies in potentially conflicting management of multiple resource use;
- to identify problems that hinder crop-livestock integration in the area;
- to suggest ways for improving crop-livestock inter-dependency for better resource management and minimising conflict and;
- to develop typologies of crop-livestock interaction for Usangu Basin.

The first field work has already been carried out, involving preliminary discussions with stakeholders and the establishment of the sampling frame for the major fieldwork, to be carried out in October, 2002. The study is funded by ENRECA to the tune of USD 10,000.

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

6.2.9 Enhancing Agricultural Production Through Sustainable Irrigation: A case of Vinyungu Farming System in Selected Zones of Iringa

This project is being undertaken under the REPOA programme. It is a USD 10,000 project whose purpose is to explore environmental problems associated with *vinyungu* farming system and provide sustainable management strategies that will improve and/or maintain their productivity and conserve wetland areas. The study also seeks to investigate the overall impact of *vinyungu* farming system on food security.

The specific objectives of the study are as follows:

- to identify vinyungu farming types and characterise them;
- to analyse the historical changes in vinyungu farming systems;
- to evaluate the level of environmental degradation associated with different vinyungu farming systems and;
- to consider potential mitigation measures that will ensure the sustainability of vinyungu farming practices particularly on household food security.

Study sites have been selected in Iringa Rural, where at least two villages in the selected wards have been selected and visited for interviews with farmers who practice vinyungu farming and data collection.

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

6.2.10 Establishment of Tarangire Information Centre

This is a USD 67,000 consultancy project contracted to the IRA by WWF/Tanzania National Parks. The objectives of the project are:

- to facilitate establishment and functioning of an Information Centre at Tarangire National Park HQ,;
- to establish user-friendly databases at the Information Centre and;
- provide GIS training to selected TANAPA staff.

Implementation of the project continues using a sub-contracted GIS expert located at site on full-time basis with backstopping from the Institute GIS staff. The training of selected TANAPA staff has already been accomplished.

Researchers: Prof. P. Yanda

7. PUBLICATIONS

During the year 2001/2002, a total of 27 publications were produced. They include 4 articles in books, 8 journal articles, and 15 research reports, consultancy reports, teaching manuals and workshop proceedings, as indicated below.

7.1 Books

1. Ngana, J.O. (2001): **Water Resources Management in the Pangani River Basin – Challenges and Opportunities**, Dar es Salaam, Dar es Salaam University Press.
2. Sosovele, H. and Y.D. Mgaya (2001): **Socio-Economic Dimensions of Biodiversity Loss in Tanzania**, Dar es Salaam, Dar es Salaam University Press.
3. Kulindwa, K.; Sosovele, H.; and O. Mashindano (2001): **Tourism Growth for Sustainable Development in Tanzania**, Dar es Salaam, Dar es Salaam University Press.
4. Kulindwa, K.; H. Sosovele; O. Mashindano and F.C. Shechambo (2001): **Maendeleo Stahimilivu (Sustainable Development)** Dar es Salaam, Dar es Salaam University Press.
5. Sosovele, H. (2001): **Conservation and Poverty: The Case of Amani Nature Reserve**, Research on Poverty Alleviation, Research Report No. 5, Dar es Salaam, Mkuki na Nyota Publications.
6. Yanda, P.Z. L. Stromquist, A.E. Majule and D. Mwamfupe (2002) **Man and Landscape in The Ruhudji Basin**. A Research Agenda. Dar es Salaam University Press.

7.2 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**.

2. Mung'ong'o, C.G; M. Mbilinyi; B. Koda and T. Nyoni (2002) "Rural Food Security Policy and Development from a Grassroots Perspective: the Challenge of the Nyerere Legacy", In **The Nyerere Legacy and Economic Policy Making in Tanzania: Year 2000 and Beyond**, Edited by ERB, University of Dar es Salaam, Dar es Salaam University Press.
3. Mung'ong'o, C.G. (2002) "Socio-economic Characteristics of Njombe District: Observations from Recent Research Work", in Yanda, P.Z. L. Stromquist, A.E. Majule and D. Mwamfupe (2002) **Man and Landscape in The Ruhudji Basin**. A Research Agenda. Dar es Salaam University Press, pp. 30-45.

7.3 Journal Articles

1. Madulu, N.F. (forthcoming) "Implications of Environmental Change on Modes of Life and Reproductive Behaviours in Tanzania", **Tanzania Journal of Population Studies and Development**, Vol. 6 Nos 1&2.
2. Majule, A.E and S.Nortcliff (2001) "Properties of selected organic residues added on highly weathered Rhodic Ferralsol and Luvic Arenosol soils under cashew, southern Tanzania", **Tropical Agriculture** (Trinidad) Volume78 (4).
3. Majule, A.E and S. Nortcliff. (2002) "Soil Acidification Process in Soils Under Cashew Fields, Southern Tanzania", **Journal of the Geographical Association of Tanzania**. (in press).
4. Mung'ong'o, C.G. (2001) "Coming Full Circle: Agricultural Involution, Non-Farm Activities and the Resurgence of Out-Migration in Njombe District, Tanzania", **Tanzania Journal of Population Studies and Development**, 7: 1 & 2, pp. 99-116.
5. Mung'ong'o, C.G. (2001) "The Peasantry as an Analytical Concept in Geographical Research: Problems of Applicability to Global and Temporal Analysis", **Tanzania Journal of Population Studies and Development**, Vol. 8, Nos. 1&2.
6. Mung'ong'o, C.G. (2001) "The Dynamics and Potential Threats to the Land Resources of Kirando Ward, South Western Tanzania", **Journal of the Geographical Association of Tanzania**, No. 30.

7. Mung'ong'o, C.G. (2001) "The Right to Food, Land and Democracy. An Analysis from a Grassroots Perspective in Three Semi-Arid Rural Districts in Tanzania", **Nordic Journal of African Studies**, 11: 75 – 92.
8. Sosovele, H. and G. Jambiya (2001) "Social Impact Assessment of the Gazettement of the Derema Forest Reserve and Wildlife Corridor in Amani, Tanga", **Journal of Population and Development**, Vol. 18.

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

1. Kauzeni, A.S; R.B.B. Mwalyosi; P.Z. Yanda; A. Majule; F.P. Maganga and C.G. Mung'ong'o (2001) "Kihansi Area Conservation Plan", Final Report to NORPLAN, A/S. and TANESCO, 97 pp.
2. Kikula, I.S.; R.B.B. Mwalyosi; C.G. Mung'ong'o and P.Z. Yanda (2001) "The Status of Game Controlled Areas as a Basis for the Establishment of wildlife Management areas in Tanzania: The Case of Arusha Region", Final Report to Wildlife Division, Ministry of Natural Resources and Tourism, 79 pp.
3. Madulu, N.F. (2001) "Population Dynamics and Sustainable Conservation of Protected Areas in Tanzania: The Case of Swagaswaga Game Reserve in Kondoa District", READ No. 2 Report in Environmental Assessment and Development, Applied Environmental Impact Assessment, Uppsala University (<http://www.env-impact.geo.uu.se/READ.htm>).
4. Madulu, N.F. (2002) "Quality Improvement and Recognition Initiative: A Stakeholder Assessment" , Report to the Ministry of Health, RCHS, Dar es Salaam,
5. Madulu, N.F. (2002) "Rapid Assessment of Appropriate Strategies and Messages in Focus Areas", Report to the Ministry of Health, RCHS, Dar es Salaam.
6. Majule, A.E (2002). Country Report-Tanzania State of Land, Water and Plant Nutrition Resources. A Consultancy Report Submitted to FAO, Rome, Italy.
7. Maganga, F.P. J. Butterworth and P. Moriarty (2001) "Domestic Water Supply, Competition for Water Resources and IWRM in Tanzania: A Review and Discussion Paper", **Proceedings of the 2nd WARFSA/ Waternet Symposium**, Cape Town, pp 169 – 178.

8. Maganga, F.P. "Formal and Informal Systems of Managing Resource Conflicts: Some Evidence from South West Tanzania", Paper Presented at the Seminar on Formalisation and Informalisation of Land and water Rights, Skodsborg, Denmark, September 2001.
9. Maganga, F.P. (with COWI A/S) (2002) "MEMA, Natural Woodland Management Project and Udzungwa Mountains Forest Management Project, Beneficiary Assessment", Final Report to Danida.
10. Yanda, P.Z.; J.O. Ngana; C.G. Mung'ong'o; C. Nahonyo; and L. Mwasumbi (2001) "Assessment of Status of Lakes Sagara and Nyamagoma Wetland and the Surroundings in the Muyovozi/Malagarasi Ramsar Site, Western Tanzania" Final Report Submitted to SIMMORS Project, Ministry of Natural Resources and Tourism, 140 pp.

8. CONSTRAINTS FACING THE INSTITUTE

In its day to day operations IRA faces several constrains, the major ones being the following:

- The staffing constraint mentioned in the last report may somewhat be eased by the de-freezing of employment to replace existing staff gaps. Also the policy of retaining retiring senior staff on contract not only enables continuation but also makes available the vast experience of such staff available to the University, the country and the international community as a whole.
- Meagre financial allocations to cover day to day running of the Institute and to enable carry out research that is not donor tied remains a constraint.
- Ageing transport facilities. This is a serious problem for a field-based Institute.