

# ***MOTIVATION, EXPERIENCES AND RESEARCH WORK I HAVE CARRIED OUT AROUND LAKE MANYARA BASIN***

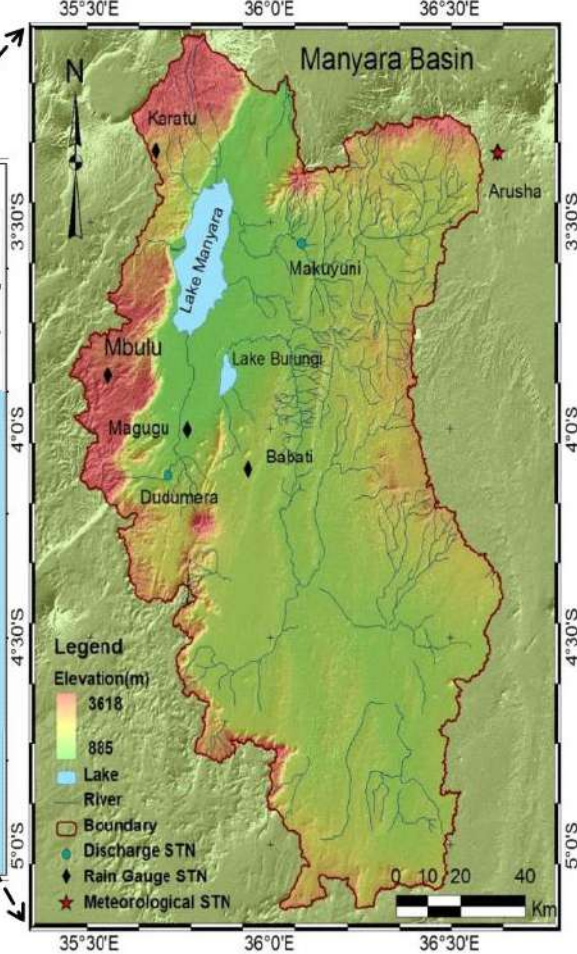
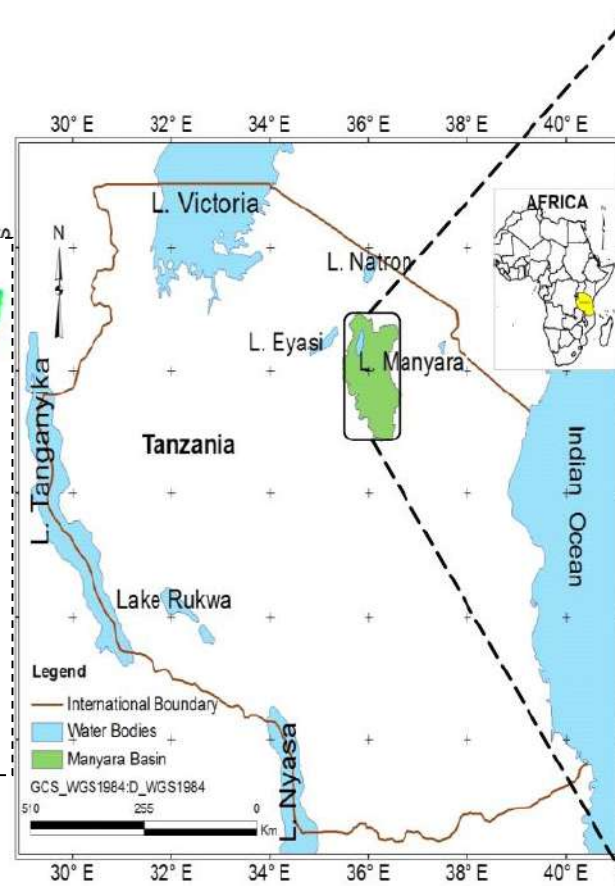
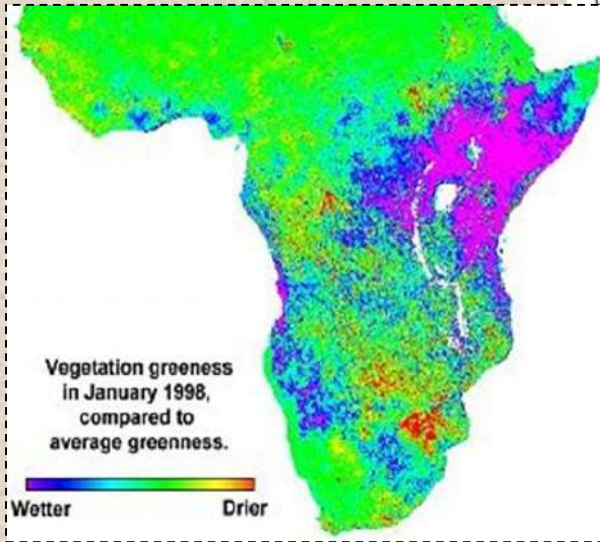
*Dr Linus Munishi,*

***THE NELSON MANDELA-AFRICAN INSTITUTION OF SCIENCE AND  
TECHNOLOGY, Tengeru P Box 447, NM-AIST, Arusha, Tanzania***





# LAKE MANYARA BASIN, Tanzania

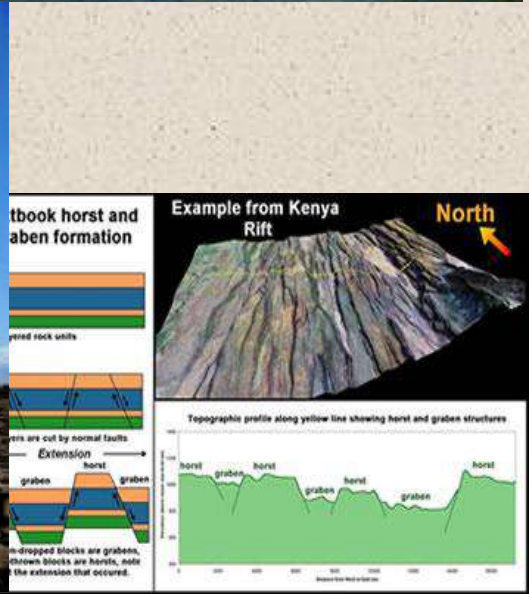


Lake Manyara catchment (Deus et al., 2013) with inset (NOAA) showing vegetation greenness after 1998 El Nino enhanced rainfall





# UNDERSTANDING THE LANDSCAPE EVOLUTION IN LAKE MANYARA BASIN









# Consequences of disturbances

Anthropogenic activities ((e.g. unsustainable farming practices, land conversions) disrupt all freshwater systems hugely from their pristine states.

The **implications** for this are far more profound than is currently widely realized.

...jeopardizing **the quality and quantity of ecosystem services** (e.g. water provisioning, food production, clean air, forage production, recreation, cultural, spiritual and aesthetic values etc.), .....this in requiring restoration of water bodies to 'good ecological quality', which is defined as only slightly different from pristine state.

A need for developing **a more holistic sustainable solution approach** that treats the impacts on the system as a whole and including physical impacts such as drainage and physical modification (e.g. gully erosion and siltation) of river channels and modification of the catchment as well as nutrient, particulate and biocide pollution.

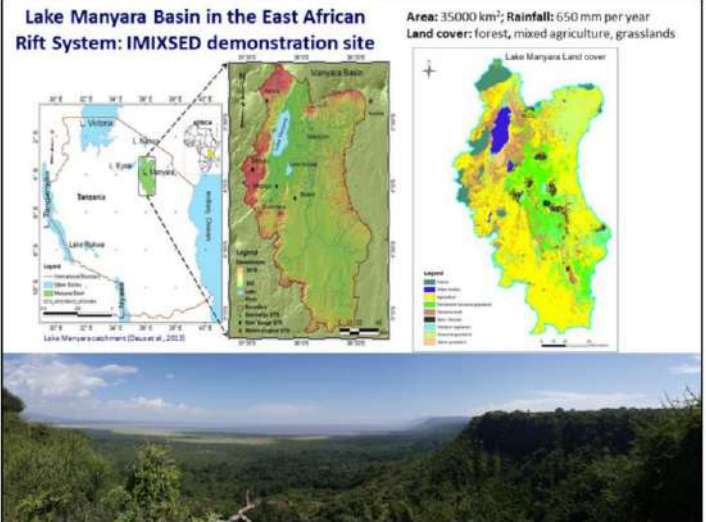
**Tackling soil degradation and environmental changes in Lake Manyara Basin, Tanzania to support sustainable landscape/ecosystem management: a sediment fingerprinting approach**



Linus Munish\*, Kelvin Mtei\*, Hugh Smith, Hari Upadhayay, Samuel Bodé, Bayu Dume Gari, Ana Navas, Amsalu Nebiyu, Maarten Wynants, Brice Semmens, Brian Stock, Pascal Boeckx, Will Blake  
 \*Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania



• **Jali Ardhi Project:** aims at evaluating the impact of soil erosion on the environmental and social well being of communities in LMB, Tanzania.



# NM-AIST IUC PROGRAMME

**Title: Healthy Aquatic Ecosystems:  
A prerequisite for Sustainable Livelihoods**

## Partners:





**Title:** Healthy Aquatic Ecosystems:  
A prerequisite for Sustainable Livelihoods

Project General objective:

To strengthen the aquatic research and adaptive capacity in Northern Tanzania: **Main Focus Lake Manyara Basin**

Specific objectives:

- To increase knowledge and capacity on the effects of pollutants on aquatic food webs and ecosystem services
- Formulate to provide local people access to information about good practices that can promote good water quality and freshwater ecosystem services



RESTORATION THROUGH NATURE BASED APPROACHES FOR MANAGING  
INVASIVE PLANTS *Bidens schimperi* AND *Gutenbergia cordifolia* IN  
NGORONGORO CONSERVATION AREA (NCA), TANZANIA

**PROJECT MEMBERS:**

Dr. Linus Munishi: Principal Investigator - **(NM-AIST)**

Dr. Issakwisa Ngondya: Post Doctoral- **(NM-AIST)**

Prof. Anna Treydte: Co-Investigator - **(NM-AIST)**

Prof. Patrick Ndakidemi: Co-Investigator - **(NM-AIST)**

Dr. Efrem Njau: Co-Investigator- **(TPRI)**

Mr. Emmanuel Mboya: Botanist- **(TPRI)**

Mr. Kanunga Marau and Ms. Aichimkunde Josephat **(Research Assistants)**

Mr. Dismas Macha and Mr. Juma Bakari **(NCAA)**

RESEARCH

Open Access

# A nature-based approach for managing the invasive weed species *Gutenbergia cordifolia* for sustainable rangeland management



Issakwisa B. Ngondya<sup>1,2</sup>, Linus K. Munishi<sup>1</sup>, Anna C. Treydte<sup>1</sup> and Patrick A. Ndakidemi<sup>1\*</sup>



Contents lists available at ScienceDirect

Acta Ecologica Sinica

journal homepage: [www.elsevier.com/locate/chnaes](http://www.elsevier.com/locate/chnaes)



## Demonstrative effects of crude extracts of *Desmodium* spp. to fight against the invasive weed species *Tagetes minuta*



Issakwisa B. Ngondya<sup>a,b</sup>, Linus Munishi<sup>a</sup>, Anna C. Treydte<sup>a</sup>, Patrick A. Ndakidemi<sup>a,\*</sup>

<sup>a</sup> Department of Sustainable Agriculture, Biodiversity and Ecosystem Management, School of Life Sciences and Bio-Engineering, The Nelson Mandela African Institution of Science and Technology, P.O. Box 447, Arusha-Tanzania

<sup>b</sup> Ministry of Natural Resources and Tourism, Wildlife Division, Tourism Hunting, Photographic Tourism and CITES Office, P.O. Box 1541, Arusha-Tanzania

**NATURE-BASED APPROACH: Restoration of ecosystem processes using the mechanisms structuring the ecological communities as they occur in their NATURAL areas**





*Gutenbergia cordifolia* (top) and *Bidens schimperi* (bottom) invaded areas where pilot plots were established before treatment application (Source Field survey, Munishi 2018)

# Other Research Projects I'm involved in the Landscape

- **Tarangire Elephant Project: Studying the Ecology and Population biology of poached Elephants of Tarangire Ecosystem**

<https://tanzania.wcs.org/landscapes/tarangire-ecosystem.aspx>

- **IMIXSED Project: Developing tools to address challenges associated with habitat and environmental degradation (Catchment/Basin Management, Aquatic Habitat and Erosion)**

<https://www.plymouth.ac.uk/schools/school-of-geography-earth-and-environmental-sciences/imixed-project>

- **Adaptation and resilience to Climate Change project**

<http://www.real-project.eu/sida-funded-adaptation-resilience-to-climate-change-project/>

- **Jali Ardhi Project: aims at evaluating the impact of soil erosion on both the environmental and social well being of communities in East Africa.**

<https://www.plymouth.ac.uk/research/centre-for-research-in-environment-society/jali-ardhi>



# Other Research Projects I'm involved in the Landscape

*continued...*

- **Nature-based approaches for Managing Invasive Plants in the Ngorongoro Conservation Area (NCA).**
- **Adaptation and Resilience to Climate Change Project: Tackling Climate and Environmental change research Programme**
- **Evaluation of Land Cover dynamics and their Management implications in the NCA**
- **LINKING CONSERVATION POLICIES/PRACTICES AND REGULATIONS TO BIODIVERSITY DATA. A CASE OF FISHERIES IN LAKE MANYARA**

Motivation for these research activities

My Passion: The Future We Want



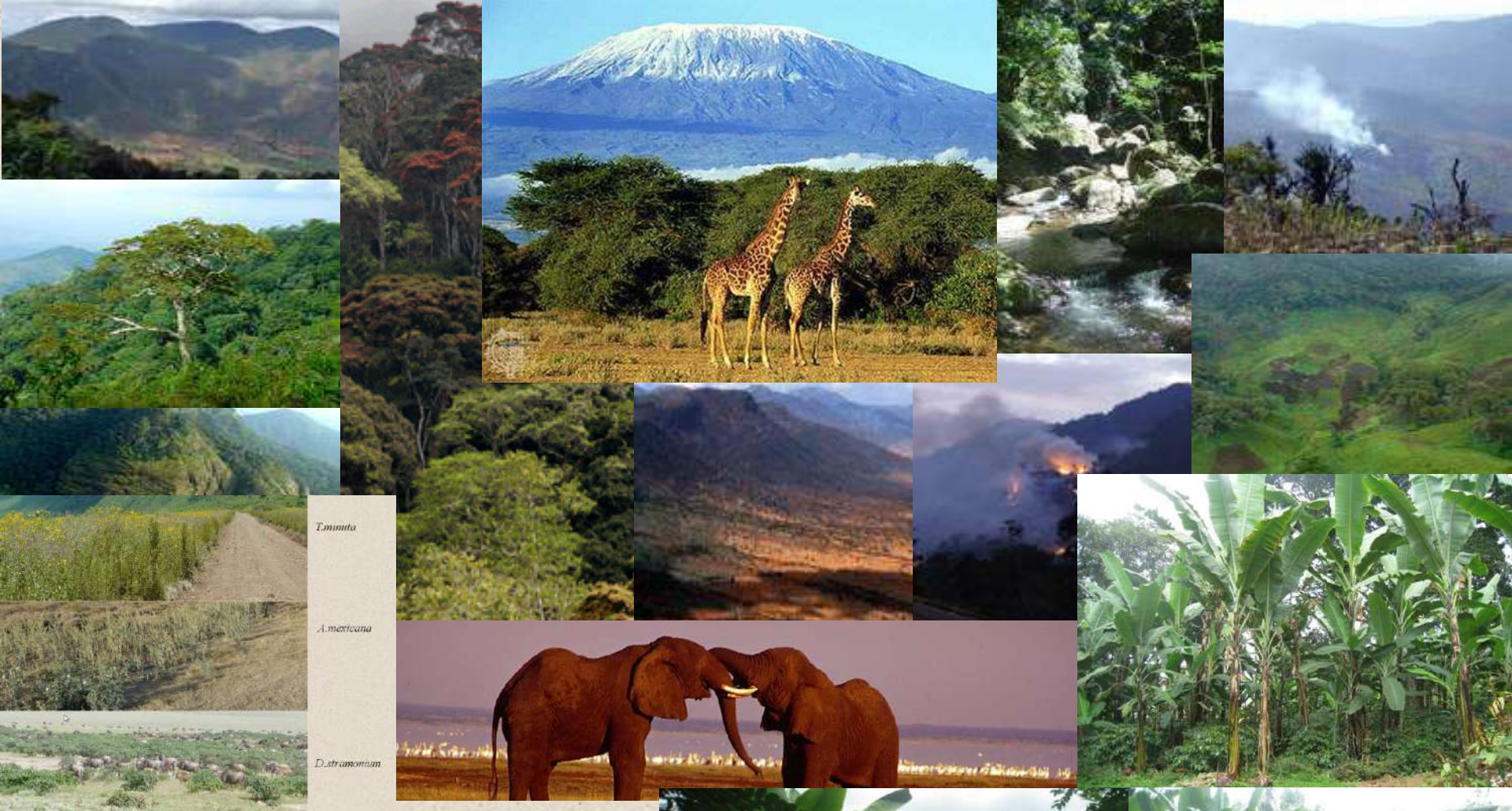
# **Motivation.....continued**

## **NM-AIST motto, mission and vision**



envision to train and develop the next generation of African scientists and engineers with a view to impacting profoundly on the continent's development through the application of science, engineering and technology and innovation to address Societal and Industrial Challenges.





*T. minuta*

*A. americana*

*D. stramonium*

The Massive Land Use/Cover Transformation Coupled with rapid population increase and its Consequences Jeopardize The Realization Of SDGs





# The Future We Want



## SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

2 ZERO HUNGER



The cost of climate variability

Climate risk contributes to chronic poverty, vulnerability, and food insecurity

Climate variability is increasing under climate change



***For those goals to be achieved, everyone needs to do their part: governments, the private sector, civil society and people like you.***

E-mail!

Email:

[linus.munishi@nm-aist.ac.tz](mailto:linus.munishi@nm-aist.ac.tz)

Thank  
You!