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Education and Qualifications

- Aug 2002 – Nov2005 Sokoine University of Agriculture**
- Studied BSc. Wildlife Management
 - Achieved: Upper Second Class GPA of 4.3-Including subjects in Life Sciences, Policy, Management and Laws
- Sep 2011 – to date University of Manchester and Central European University**
- Studying MSc. Environmental Sciences, Policy and Management (MESPOM)

Working Experience and Achievements

- Oct2007-Sep 2011 Tanzania National Parks Authority**
- Working as Park Ecologist and successfully headed Ecology Department in Katavi National Park.
 - Coordinated the mission to identify refuge areas for large mammals within and outside protected areas, in the Greater Katavi-Mahale Ecosystem.
 - I established an advanced water monitoring system in Katavi ecosystem
 - Co-published a paper (in *Ecohydrology & Hydrobiology*) titled “A review of water crisis in Tanzania’s protected areas, with emphasis on Katuma River-Lake Rukwa ecosystem”

Skills and Interests

IT Skills Familiar with GIS and ICT in environment sciences, Golden software Grapher6, Microsoft office MS word, excel, power point

Sport I enjoy playing football and mountain trekking

Future Aspirations

Aspiration To become a highly performing and reputable person in conservation research and provide consultancy on environmentally sound policies, laws & practices for sustainable development at different levels.

References

Project Supervisor Prof. Keith White
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(i) Scope of the study

Research Title: Assessment of Surface Water Budget and Quality in Arusha National Park, Tanzania: Is the water extraction harmful to the watershed and ecological integrity?

Study area description: Arusha National Park (552 km²) is located in the northern part of Tanzania about 25 km from the city of Arusha. The Park is famous for its biodiversity of habitats and wildlife and is one of the favorite tourist destinations. It contains Mount Meru, which is the 5th highest mountain in Africa and harbors a mountainous forest which serves as a key *water catchment* for consumption by wildlife and the surrounding human communities.

Needs: For quite a long time, water has been extracted from the Park for domestic use and farming in the surrounding villages, small towns and the city of Arusha. There is no respect of minimal environmental flows where water is extracted from streams inside the National Park, and as a result, there might be significant negative local ecological effects in the Park and particularly so downstream of the extraction points. The demand for water by communities outside the park is growing rapidly, and no-one knows the amount of water available in the park and the minimum environmental flows that are needed. Hearsay evidence is that rainfall is declining, possibly due to higher cloud levels and thus less interception of water by Mount Meru, a possibly consequence of global warming, and this may lead to a decrease of the amount of water available for consumption by both wildlife and people. Further some of the water in the park is unusable for consumption as it is either very saline or Fluoride-rich and no-one knows how much consumable water is available. Unfortunately the park management has continued allocating water for communities' consumption without the water quality and quantity data that are needed to determine sustainability for water and wildlife resources management. Such issues include; How much water is available? How much of the available water is extracted, particularly so in the dry season? What are the minimum environmental flows needed downstream of water extraction points in the dry season? How much of the water system in the Park is fresh (hence suitable for human and animal consumption) and how much saline or fluorine-rich (unsuitable for consumption extracted)? What are the consequences of over-extraction of water for wildlife and watershed? The park management has a responsibility to ensure that good and adequate water is available not only for human consumption but also for ecological health on a sustainable basis, but this is only possible in practice when the data on water quantity and water quality are available to enable decision making for water management.

What will be done: The research will focus to answer the key issues stated above, focusing on the dry season where water availability is at a minimum, specifically it will result into; (a) Assessment of Water budget and Quality for the Park, (b) Assessment of the impacts if any of over-extraction of water on wildlife and watershed (c) Proposing management measures for sustainable management of water to meet ecological and social needs. The study therefore will involve collecting data on water quantity; by measuring flow rates at different extracted water sources (upstream and downstream of water extraction points), also in some of potential water sources which are not yet exploited in the Park. Historical rainfall data from rangers posts as well as historical rainfall data outside the Park will be collected to generate mean rainfall distribution maps as well as time-series of rainfall over time (to evaluate seasonal and inter-annual fluctuations as well as early signatures of climate change). As for water quality, the study will cover; water pH, Salinity/conductivity, Dissolved Oxygen

and Temperature. Nutrients, fluoride contents in water and possibly turbidity (water in streams in the Park are visually seen to be very clean) may also be measured where necessary in collaboration with Park staff. To assess whether there is impact on ecosystem, surface water systems will be mapped to indicate distribution in terms of fresh and saline waters and superimpose wild animals and vegetation maps in relation to these water sources.

(ii) Benefits: The outcome of this study will be beneficial for park management and the surrounding communities as it will provide necessary information required for the sustainable water management to meet ecological and social needs.

(iii) Budget: The funds applied will be used to implement the project and specifically will be spent as shown in the table below

Description of items required	Use	Measure Unit	Unit cost (£)	Number of Units	Estimates (£)
Return flight ticket	Return flight UK-Tanzania	ticket	700	1	700
Water flow meter	To measure stream flow rates	Pc	195	1	195
pH meter	Measure water pH	pc	75	1	75
Salinity probe	Measure salinity	pc	75	1	75
Assistant allowance	Assisting in data collection	Day rate	10	30days	300
Total amount needed					1345

(iv) Plan: Plan of entire study is summarized in the following table

Activity	When to be done	Where to be done	Expected Output
Project proposal writing	October to December 2012	Manchester University	Project proposal accomplished
Site identification and logistic set up	End of January 2013	Arusha National Park	Identification of monitoring sites for data collection. Identification and arrangement of necessary logistics for data collection
Data collection	Early February to April 2013	Arusha National Park	Accomplished collection of both primary and secondary data on water budget, quality, water use patterns by wildlife and watersheds status
Data Analysis	End of April to Mid-May 2013	Manchester	Data Analysis accomplished
Report writing	Mid-May to Mid-June 2013	Manchester	Project Report accomplished and submitted

(iv) Summary

It is important to conduct this project because its findings will provide crucial information for decision making for sustainable water management in the park to meet both ecological and social needs. Having acquired knowledge on water sciences and management in my Master's program and also that I previously worked as park ecologist in a park where man-made water shortages are affecting wildlife, I clearly understand the importance of this project in terms of the problem to be addressed and usefulness of the solutions to the park management and the community at large.