

# **CURRICULUM VITAE**

November, 2008



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## **PERSONAL DATA:**

Date of Birth: 2<sup>nd</sup> June, 1954  
Place of Birth: Kwale, Kenya  
Citizenship: Kenyan  
Marital Status: Married with 3 Children

## **CURRENT POSITION:**

Acting Deputy Vice Chancellor (Academic), Kenyatta University, and Professor of Environmental Geochemistry, Department of Environmental Sciences, Kenyatta University (Since October, 2003)

## **PREVIOUS POSITIONS:**

Chairman, Department of Environmental Sciences (June 2004 – August 2008)

Professor of Environmental Geochemistry, School of Environmental Studies, Moi University (May, 1992 – October 2003)

Dean, School of Environmental Studies, Moi University (Sept., 1995 – Sept., 1996)

Dean, School of Graduate Studies, Moi University (Aug., 1990 – Oct., 1994).

Associate Professor, School of Environmental Studies, Moi University (Feb., 1989 – May, 1992)

Senior Lecturer, Department of Geology, University of Nairobi (June, 1987 – Jan., 1989)

Lecturer, Department of Geology, University of Nairobi (Feb., 1982 – June, 1987)

Graduate Assistant & Research Assistant, Department of Geosciences, Pennsylvania State University, U.S.A. (Aug., 1977 – Nov., 1981)

Tutorial Fellow, Department of Geology, University of Nairobi (Sept., 1976 – Feb., 1982)

### **HONORARY POSITIONS:**

1984 - 1989: Faculty of Science Representative to Senate, University of Nairobi.

1994 - 1999: Member, Research Committee, Kenya National Council for Science and Technology.

1996 - 2000: Member, Board of Governors, Shimba Hills Secondary School, Mombasa.

1996 - 2003: Coordinator, Capacity Building Component, Lake Victoria Environmental Management Project.

2001 - 2002: Coordinator, IAEA Project RAF/8/034 - Isotope Hydrology Integration in the Water Sector.

2001 - 2004: Member, National Environmental Management Council, Kenya

2001 – Present: Member and Chairman of the Board, Youth Enterprise Foundation

2002: Member, Conference organizing Committee, Wetlands, Tanzania

2002: Member International Panel of Scientists, ICHWAM conference, Hyderabad, India

2002 – Present: Member, International Editorial Advisory Board, PeCOP Journal of The Sciences, Nigeria

2003 – Present: Member, Kubo Educational Foundation (Secretary 2005 - 2007, Chairman since 2007)

2005 – Present: Member, Kenya National Working Group on the WIOLaB Project on water, sediment and biota quality assessment and monitoring

2005 – Present: Patron, Taita – Taveta Kenyatta University Students Association

2006 – 2007: Member, Scientific Committee, 6<sup>th</sup> Conference on Wastewater Reclamation and Reuse for Sustainability, Antwerp, Belgium

2007 – Present: Member, NEMA Board of Management, and Chairman, Research, Planning and Development Committee.

2007 – Present: Member, Board of Trustees of the NEMA Retirement Fund Scheme

2007 – Present: Chairman, Environment Committee, Kenya Alliance of Residents Associations (KARA)

- 2007 – Present: Co-chair, Organising Committee, First National Conference on the Environment, Kenya
- 2007 – Present: Chair of the WIO-LaB Regional Working Group on Water and Sediment Quality
- 2008 - Member, Kenya National Committee on “International Year of Planet Earth”

## **MEMBERSHIP TO PROFESSIONAL BODIES**

- Member, International Water Association
- Member, International Association of Hydrological Sciences
- Member, Kenya Institute of Environmental Assessment (Co-opted Council Member 2004 - 2007)
- Member, Eastern Africa Association for Impact Assessment

## **EDUCATION:**

- 1973 – 1976: University of Nairobi. (B.Sc. 1<sup>st</sup> Class Honours, Geology, Chemistry)
- 1977 – 1979: Pennsylvania State University. (MS. Geochemistry/Mineralogy; thesis title, “The uranium content of zircons from the Catskill Formation, Eastern Pennsylvania” – Supervisor, Prof. A. W. Rose).
- 1979 – 1981: Pennsylvania State University. (Ph.D. Geochemistry; thesis title, “Factors controlling the kinetics of silicate – water interactions” – supervisor, Prof. A. C. Lasaga).
- 1988 (Sabbatical): United Nations University, Orkustofnun, Iceland. Research: “Chemistry of geothermal fluids”.
- 1994/95 (Sabbatical): Commonwealth Senior Academic Staff Fellowship. Univ. of Manchester, U.K. Research: “Kinetics of Mineral – Water interaction”.

## **CONFERENCES, SEMINARS AND WORKSHOPS:**

- 1. Oct., 1978: 43<sup>rd</sup> Annual Field Conference of Pennsylvanian Geologists, Hazleton Pennsylvania, U.S.A.
- 2. Nov., 1981: 9<sup>th</sup> Annual Meeting of the Geological Society of America, Cincinnati, Ohio, U.S.A. Presented a paper, “Factors controlling the dissolution kinetics of nepheline”.
- 3. June, 1982: Regional Seminar on Geothermal Energy in Eastern Africa, Nairobi, Kenya.
- 4. July, 1982: Paper accepted for presentation at the II International Seminar on Lateritisation Processes, Sao Paulo, Brazil.

5. Dec., 1982: 6<sup>th</sup> Conference on African Geology, Nairobi, Kenya. Co-presented two papers: (1). “Geology of Ithanga Hills Area” and (2). Trace element studies of some spheroidal rocks from the Precambrian Mozambique belt around Thika area, Kenya”.
6. Mar., 1984: 1<sup>st</sup> Conference on the Geology of Kenya, Nairobi Kenya. Secretary to the Organising Committee.
7. Sept., 1984: International Symposium on Hydrochemical Balances of Freshwater Systems, Uppsala, Sweden. Presented a paper, “Some implications of the role of kinetics in enhancing element transport”.
8. Nov., 1984: Olkaria Geothermal Development Scientific and Technical Review Meeting, Nairobi, Kenya.
9. Sept., 1985: 2<sup>nd</sup> Annual Conference on the Geology of Kenya, Nairobi, Kenya.
10. Oct., 1985: International Seminar on Laterite, Tokyo, Japan. Presented a paper, “Thermodynamic and kinetic aspects of formation of bauxites”.
11. Nov./Dec., 1985: IAEA Regional Training Course on Radiochemistry and Analytical Techniques in Nuclear Science, Nairobi, Kenya. Presented two invited papers: (1). “Tracers in Geochemistry”, and (2). “Analytical Techniques in Mineral Resources Evaluation”.
12. June, 1986: 3<sup>rd</sup> Annual Conference on the Geology of Kenya, Nairobi, Kenya. Chairman, Conference organising Committee.
13. Feb., 1987: UNDP/DTCD Technical Review Meeting on exploration of geothermal energy, Nairobi, Kenya. Presented an invited paper, “Geochemistry of low enthalpy geothermal areas in Kenya”.
14. Apr./May, 1987: International Workshop on the standardisation of Kiswahili vocabulary in physics, chemistry, biology, and linguistics, Dar es Salaam, Tanzania. Chairman, Working Committee on Chemistry.
15. Oct., 1987: 4<sup>th</sup> Annual Conference on the Geology of Kenya. Presented a paper, “The sweet waters of Meru district”.
16. May, 1988: V. M. Goldschmidt Conference of the Geochemical Society, Baltimore, Maryland, U.S.A. Presented a paper, “Deposition of metals from the Jombo Hill Geothermal field, Coast Province, Kenya”.

17. Aug., 1988: International Workshop on the Deposition of solids in Geothermal Systems, Reykjavik, Iceland.
18. May, 1989: National Symposium on Environmental Studies in Moi University Kenya, Kabarnet, Kenya. Presented a paper, "Curricula in Physical Sciences".
19. Sept., 1989: Symposium on Environmental Pollution and its Management in Eastern Africa, Dar es Salaam, Tanzania. Presented a paper, "Environmental Effects of Geothermal Power Generation and Utilisation".
20. Sept., 1989: 1<sup>st</sup> National Research Workshop on Meteorological Applications and Services, Nairobi, Kenya. Presented an invited paper, "Geothermal Energy".
21. March, 1990: Eburru Scientific Review Meeting, Nairobi, Kenya. Invited Participant.
22. Apr./May, 1990: V. M. Goldschmidt Conference of the Geochemical Society, Baltimore, Maryland, U.S.A. Presented a paper, "Effects of analytical uncertainties on complete fluid/mineral equilibria calculations: an example of Al".
23. Aug., 1990: International Symposium on Geochemical Prospecting, Prague, Czechoslovakia. Paper accepted for presentation, "Correlation between chemically and physically transported barium anomalies over the Vitengeni lead/barite mineral deposit, Coast Province, Kenya".
24. Aug., 1990: International Symposium on Geothermal Energy, Kilauea Iki, Hawaii, U.S.A. Paper accepted for presentation, "Chemical geothermometry and resource potential of low enthalpy geothermal systems in Kenya".
25. Aug., 1990: Regional Seismological Assembly in Africa. Nairobi, Kenya. Presented a paper, "Chemistry and potential of low enthalpy geothermal resources in Kenya".
26. Sept., 1990: 15<sup>th</sup> Colloquium on African Geology, Nancy, France. Paper accepted for presentation, "Mineral and thermal waters of Kenya – an update".
27. Oct., 1990: Review meeting of the British – Kenyan geothermal exploration project. Invited Participant.

28. Dec., 1990: African Regional Conference on responsibilities towards future generations and their environment, Nairobi, Kenya. Invited Participant.
29. June, 1991: Workshop on causes and consequences of sea level changes in the western Indian Ocean coasts and islands, Mombasa, Kenya. Presented a paper, “Coastal sediment dynamics in a changed climate”.
30. July, 1991: World Bank Environment and Development seminar on integrating environmental considerations into the development process in Africa, Harare, Zimbabwe.
31. Sept., 1991: 2<sup>nd</sup> International Symposium on Environmental Geochemistry, Uppsala, Sweden. Co-presented a paper, “Lead pollution from motor vehicle emissions in Uasin Gishu district, Eldoret, Kenya”.
32. Nov., 1991: Africa International Conference on Environment, Maputo, Mozambique. Presented a paper, “Geothermal and solar energy for sustainable development in Africa – possibilities and dangers”.
33. Feb., 1992: DSE/KU National staff development workshop, Mombasa, Kenya. Presented a paper, “Staff development programmes in Moi University”
34. Sept., 1992: International Conference on Industrial uses of geothermal energy, Reykjavik, Iceland. Paper read, “Possibilities for Industrial Applications of Geothermal Heat in Kenya”.
35. Nov., 1992: Regional Workshop on Environmental Education Networking, Nairobi, Kenya. Chairman of the Workshop.
36. July, 1993: World Bank/EDI meeting on the energy sector in southern Africa, Gaborone, Botswana.
37. Oct., 1993: UNEP/WHO/ILO Seminar on training approaches for environmental management in industry, Mauritius.
38. Nov./Dec., 1993: African Studies Association meeting on History of land use in Africa, Boston, U.S.A.
39. Apr., 1994: Workshop on Environmental Impact Assessment of the 2<sup>nd</sup> Mombasa and Coastal Water supply engineering and rehabilitation project, Tsavo, Kenya. Presented an invited paper, “Potential environmental impacts in the Tsavo – Galana – Sabaki water shed and river system”.

40. Apr., 1994: Workshop on Traditional Techniques of Microclimate improvement, Nairobi, Kenya. Presented an invited paper, "The role of external cooperation in national capacity building".
41. Sept., 1995: Workshop on Geochemistry Applied to Water Resources issues in Africa, Sodore, Ethiopia. Presented two papers: (1). "The significance of the study of mineral – water interaction kinetics and thermodynamics in understanding water quality", and (2). "Some studies on pollution of natural waters in Kenya".
42. Jan., 1996: Environment and Urban Development Training Project; Special topic workshop on Environmental Impact Assessment, Nakuru, Kenya. Invited Guest. Delivered the official opening address.
43. Apr./May, 1997: 5<sup>th</sup> Scientific Assembly of the International Association of Hydrological Sciences, Rabat, Morocco. Presented a paper, "Pollution of groundwater in Coastal Kwale district, Kenya".
44. Sept., 1997: Workshop for project and task coordinators, Lake Victoria Environmental Management Project, Kisumu, Kenya. Presented a paper, "Capacity building at Moi University".
45. Jan., 1998: Seminar on the Kenya National Environment Action Plan (NEAP), Nairobi, Kenya.
46. Apr., 1998: Workshop on Research and Training needs for the Lake Victoria Environmental Management Project, Kericho, Kenya. Workshop Convenor.
47. Sept., 1998: UNDP Seminar on Capacity 21, Kenya's response to Agenda 21, Mombasa, Kenya.
48. Oct./Nov., 1998: IAEA training course on Quality Assurance in isotope hydrology laboratories, Vienna, Austria.
49. Oct., 1999: Workshop on implementation of the Lake Victoria Environmental Management Project, Mwanza, Tanzania
50. Nov. 1999: Coast Ecology II Conference, Mombasa Kenya. Co presenter of 5 papers; (1) Karanja, F. K. and Tole, M. P. , "Available trace metal concentrations and distribution in mangrove sediments, Ngomeni, Kenya. (2). Mdodo, R. M., Tole, M. P., Obura, D., and Muthiga, N. "Environmental factors affecting coral bleaching in Kenya during the 1997/98 ENSO event". (3). Munyao, T. M., Tole, M. P., and Jungerius, P., "Sabaki River sediment transport and deposition in the Indian Ocean". (4). Muthini, M., Tole, M. P., and Otieno, D., "Solid

waste pollution loads in beach hotels in Kwale and Mombasa districts". (5). Mwakumanya, M., Tole, M. P., and Odhiambo, B. D. O., "Coastal erosion in Kenya: hydrodynamic factors affecting Nyali and Bamburi beaches".

51. May/June 2000: World Geothermal Congress 2000, Japan. Co-presenter of two posters; (1) Tole, M. P., and Simiyu, G. M. "Concentrations of trace elements in waters, soils, and plants of the Olkaria geothermal field, Kenya.", (2) Tole, M. P., and Marani, M. "Concentrations of H<sub>2</sub>S in air around the Olkaria geothermal field, Kenya."
52. Sept. 2000 LOICZ Workshop, Zanzibar, Tanzania. Presented a paper, "Nutrient budget modelling for the Sabaki Estuary, Malindi, Kenya".
53. November 2000 Workshop on promoting best practices for conservation, management, and sustainable use of water resources in the south, Trieste, Italy. Co-Presenter of a paper, "Use of constructed wetlands to treat wastewater in tropical countries: the case of the Carnivore/Splash constructed wetland, Nairobi, Kenya".
54. March 2001 Workshop on Isotopic and Geochemical Techniques in Geothermal Exploration and Reservoir Management, Manila and Cebu City, Philippines. Presented a paper, "Stable isotope compositions of some low enthalpy geothermal systems in Kenya".
55. July 2001 LOICZ/UNEP Regional Synthesis Workshop for the Africa - Europe Region. The Hague, the Netherlands. Presented a paper, "Classification of the East African Coast using the LOICZ typology modelling tool".
56. December 2001 1<sup>st</sup> Regional Lake Victoria Environmental Management Project Scientific Conference. Kisumu, Kenya. Co presenter of a paper, "Factors contributing to delays in completion of postgraduate programs in East African Universities."
57. February 2002 3<sup>rd</sup> Great Lakes of the World (GLOW III) Conference. Arusha, Tanzania. Co presenter of a paper, "Concentrations of heavy metals in water, fish, and sediments of the Winam Gulf, Lake Victoria, Kenya".
58. March, 2002 IAEA/KenGen Scientific Conference on isotope hydrology in geothermal reservoir management, Nairobi, Kenya. Co presenter/presenter of 3 papers:
1. "Removal of acidity, alkalinity, and selected heavy metals in the infiltration ponds at Olkaria east geothermal power station."
  2. "Isotope hydrology and its development in Kenya" – Invited Lecture



3. “Environmental Impact Assessment study of the Orpower4 Inc. Olkaria III geothermal development.”
59. April, 2003 2<sup>nd</sup> KenGen Geothermal Conference, UNEP Headquarters, Nairobi, Kenya. Co-presenter of 2 papers:
1. “Concentration of selected metals in soils and grass and health implications for grazing wild animals in Hell’s Gate National Park, Kenya”, with G. M. Simiyu and T. C. Davies.
  2. “Outflow of Lake Naivasha based on stable isotope composition of groundwater”, with M. K. Arusei and J. K. Sanga.
60. April, 2003 Eastern Africa Geothermal “Market Acceleration” Conference, UNEP Headquarters, Nairobi, Kenya.
61. October, 2003 3<sup>rd</sup> Lake Victoria Environmental Management Project, Capacity Building Component scientific Workshop, Busia, Kenya.
62. November, 2003 African Regional Review Workshop for Lake Basin Management. Nairobi, Kenya. Chairman, Session Briefs on Lakes Naivasha, Nakuru, and Baringo.
63. April, 2004 3<sup>rd</sup> KenGen Geothermal Conference, Nairobi, Kenya
64. June, 2004 East African Community/ African Centre for Technology Studies Workshop to Review Draft Guidelines for Environmental Assessment in Shared Ecosystems. Nairobi, Kenya.
65. August, 2004 East African Community/ African Centre for Technology Studies Workshop to Finalise Draft Guidelines for Environmental Assessment in Shared Ecosystems. Arusha, Tanzania.
66. September, 2004 UNEP/NEPAD Workshop on . Presented an invited paper, “Environmental policy in Africa”
67. November, 2004 UNESCO Africa Sub – Regional seminar on the Implementation of the Science Agenda – Framework for Action, Nairobi, Kenya. November 22 – 24, 2004.. Presented an invited paper, “Science, Environment, and Sustainable Development”
68. April, 2005 ERB Environmental, Health and Safety policy for the Electric Power Sub-sector in Kenya. Safari Park Hotel, Nairobi, Kenya. Invited Discussant.
69. April 2005 Climate Change and Development in Kenya. World Agroforestry Centre, Nairobi, Kenya. Chairman of session on Case Studies.

70. May 2005 Workshop on preparation of the Kenya wetland policy. Nakuru, Kenya.
71. May 2005 Inception Workshop for Lessons Learnt Reports on the Lake Victoria Environmental Management Project, Kisumu, Kenya.
72. July 2005 National workshop for Lessons Learnt Reports on the Lake Victoria Environmental Management Project, Kisumu, Kenya
73. August 2005 First regional meeting of the UNEP – GEF WIOLaB water, sediment, and biota quality assessment working group, Durban, South Africa.
74. September, 2005 Regional workshop for Lessons Learnt Reports on the Lake Victoria Environmental Management Project, Jinja, Uganda.
75. November 2005 Thematic workshop meeting African Environmental Outlook (AEO) The City of Nairobi Outlook Report, Nairobi, Kenya.
76. November 2005 Regional workshop for Lessons Learnt Reports on the Lake Victoria Environmental Management Project, Arusha, Tanzania.
77. February 2006 Second regional meeting of the UNEP – GEF WIOLaB water, sediment, and biota quality assessment working group, Gold Crest Hotel, Mauritius.
78. April, 2006 National Workshop on preparation of Project Document for Phase II of the Lake Victoria Environmental Management Project, Kisumu, Kenya.
79. May, 2006 Coastal Ecology Conference IV, Plaza Beach Hotel, Mombasa, Kenya.
80. Jan/Feb 2007 Workshop on Certified Coffee production and its impacts on workers. University of Leiden, Netherlands. Invited Discussant
81. March, 2007 Workshop on the WIOLaB project on water, sediment and biota quality assessment and monitoring, Mombasa, Kenya. Workshop Chairman.
82. July 2007 The Third Regional Meeting on Water, Biota and Sediment Quality Assessment and Monitoring Working Group of WIOLaB, Maputo, Mozambique. Elected Chairman of the meeting.
83. November 2007 Workshop on the Assessment of the Level of Implementation of the Integrated Water Resources Management in the Nile Basin Countries. Cairo, Egypt. Invited Expert Participant.

84. January 2008 Workshop on Certified Coffee production and its impacts on workers and the environment. University of Addis Ababa, Ethiopia. Invited Discussant
85. February 2008 Workshop on Review of EIA/EA Regulations for Coast Province. Mombasa, Kenya
86. March 2008 National Workshop on Review of EIA/EA Regulations, Nairobi, Kenya. Presented a paper, “Summary of (EIA/EA) Issues Raised during Public Consultations”
87. March 2008 Workshop on Review of EIA/EA Regulations, Mombasa
88. March 2008 Regional Workshop on Regional CBNRM Learning Linkages Project, Nairobi, Kenya. Presented a paper, “Tiomin and Arabuko Sokoke Forest”
89. May 2008 1<sup>st</sup> National Conference on the Environment, Nairobi, Kenya. Chairman of the Organising Committee.
90. July 2008 Regional Workshop on CBNRM Project, Kabale Uganda. Chairman of Session.
91. August 2008 Workshop of the Drafting Team of the Strategic Action Plan (SAP) for the Western Indian Ocean (WIO), Mombasa, Kenya. Facilitator for the Water and Sediment Quality component.
92. September 2008 Regional Workshop on CBNRM Project, Nairobi, Kenya. Presented a paper, “Case Study of Arabuko Sokoke Forest”
93. October 2008 Regional Workshop of the WIOLaB Municipal Waste Water Task Force, Nampula, Mozambique. Facilitator of the Session.

## **PUBLICATIONS:**

### **(a) Refereed Publications:**

1. Tole, M. P. (1984). Some implications of the role of kinetics in enhancing element transport. *In* Erikson, E. (Ed.). *Hydrochemical Balances of Freshwater Systems*. IAHS Publication No. 150, pp. 79 – 86.
2. Mathu, E. M. and Tole, M. P. (1984). Geology of the Ithanga Hills area. *Journal of African Earth Sciences* Vol. 2 pp. 10 – 16.
3. Tole, M. P. (1985). The kinetics of dissolution of zircon (ZrSiO<sub>4</sub>). *Geochimica et Cosmochimica Acta* Vol. 49 pp. 452 – 458.

4. Tole, M. P. (1985, Editor). Geology for the Development of Kenya. Proceedings of the 1<sup>st</sup> Conference on the Geology of Kenya. Geological Society of Kenya, Publication No. 2 76 pp., Nairobi.
5. Tole, M. P. (1985). Thermodynamic and kinetic aspects of formation of bauxites *in* Ogura, Y. (Ed.). International Seminar on Laterite. Mining and Metallurgical Institute of Japan, pp. 249 – 261.
6. Tole, M. P. (1985). Geochemical studies of the geothermal area east of the Jombo hill intrusion, Coast Province, Kenya – 1. Hot water reservoir temperatures. Kenya Journal of Science and Technology series A. Vol. 6 pp. 91 –101.
7. Tole, M. P., Lasaga, A. C., Pantano, C., and White, W. B. (1986). The kinetics of dissolution of nepheline (NaAlSiO<sub>4</sub>). *Geochimica et Cosmochimica Acta* Vol. 50 pp. 379 – 392.
8. Tole, M. P. (1987). Thermodynamic and kinetic aspects of formation of bauxites. *Chemical Geology* Vol. 60 pp. 95 – 100.
9. Tole, M. P., Mathu, E. M., and Ichangi, D. W. (1987). The source of the Yatta phonolite - evidence from phenocryst elongations. *Kenya Journal of Science and Technology Series A*. Vol. 8 pp. 113 – 115.
10. Tole, M. P. (1987). The chemistry of the “sweet” waters of Kiangua, North West of Chogoria, Meru district. *Kenya Journal of Science and Technology Series A* Vol. 8 pp. 117.
11. Tole, M. P. (1988). Low enthalpy geothermal systems in Kenya. *Geothermics* Vol. 17 pp. 777 – 783.
12. Dobrovolsky, E. and Tole, M. P. (1988). (in Russian). The peculiarities of the kinetics of zircon dissolution in view of radioactive elements content. *Geological Journal* Vol. 6(88) pp. 72 – 78.
13. Tole, M. P. (1989). Environmental effects of energy generation and utilisation: geothermal power. Proceedings of the Symposium on environmental pollution and its management in eastern Africa, Dar es Salaam. Pp.81 – 89.
14. Tole, M. P. (1990). Present day ore deposition in the geothermal systems of Kenya: I. the Mwananyamala hot springs, north east of Jombo hill. Coast Province. *Geothermics* Vol. 19(2) pp.233 – 239.
15. Tole, M. P. (1990). Stable isotope studies of some low enthalpy geothermal systems in Kenya. *Journal of African Earth Sciences* Vol. 11(1 – 2) pp.33 – 37.

16. Tole, M. P. (1990). Chemical geothermometry and resource potential of low enthalpy geothermal systems in Kenya. Transactions of the Geothermal Resources Council.
17. Tole, M. P. (1990). Environmental effects associated with the use of geothermal energy. *Discovery and Innovation* Vol. 2(3) pp. 21 – 26.
18. Tole, M. P. (1990). Mineral and thermal waters of Kenya – an update. Proceedings of the 15<sup>th</sup> Colloquium on African geology, Nancy.
19. Tole, M. P. (1992). Geothermal and Solar Energy for Sustainable Development in Africa – Possibilities and Dangers. *In* Lopes, H.; Jergman, K.; and Aswathanarayana, U. (Eds., 1992). *Environment, Technology and Sustainable Development. Proceedings of the “Africa International Conference, Maputo, Mozambique, Nov. 25 – 29, 1991. Pp. 139 – 147.*
20. Tole, M. P. (1992). Geochemical studies of the geothermal systems of Kenya I. The Homa Mountain geothermal system. *Discovery and Innovation* Vol. 4(3) pp. 23 – 29.
21. Tole, M. P. (1992). Geochemical studies of the geothermal systems of Kenya II. The Majimoto geothermal system. *Journal of African Earth Sciences* Vol. 14(3) pp.387 – 391.
22. Tole, M. P. (1992). Comment on “kinetics of quartz dissolution in electrolyte solutions using a hydrothermal mixed flow reactor”. *Geochimica et Cosmochimica Acta* Vol. 56 pp. 4091 – 4092.
23. Tole, M. P., Armannsson, H., Arnorsson, S., and Zhong he, P. (1993). Fluid/mineral equilibrium calculations for geothermal fluids and chemical geothermometry. *Geothermics* Vol. 22(1) pp. 17 – 37.
24. Kunguru, K. K. and Tole, M. P. (1994). Contamination of soils, maize, wheat and milk with lead from motor vehicle emissions in Uasin Gishu district, Kenya. *Discovery and Innovation* Vol. 6(3) pp.261 – 264.
25. Tole, M. P. (1995). The role of external cooperation in national capacity building. Chapter 8 *in* Stigter, C. J., Wangati, F. J., Ng’ang’a, J. K., and Mungai, D. N. (Eds.) “The TTMI Project and the ‘Picnic’ model”. Proceedings of the TTMI Workshop , Nairobi, April 1994. Wageningen Agricultural University, Wageningen, The Netherlands.
26. Tole, M. P. (1996). Geothermal energy research in Kenya: a review. *Journal of African Earth Sciences* Vol. 23(4) pp. 565 – 575.

27. Tole, M. P. (1997) (Ed.). Environmental Impact Assessment in Kenya: Theory and Practice. Proceedings of the Environmental Impact Assessment Seminar, July/August 1996. Academy Science Publishers, Nairobi 89pp.
28. Tole, M. P. (1997). Environmental Impact Assessment of Geothermal Energy Projects in Kenya. *In* Tole, M. P. (1997) (Ed.). Environmental Impact Assessment in Kenya: Theory and Practice. Proceedings of the Environmental Impact Assessment Seminar, July/August 1996. Academy Science Publishers, Nairobi 89pp.
29. Tole, M. P. (1997). Pollution of groundwater in the Coastal Kwale District, Kenya. International Association of Hydrological Sciences Publication No. 240 pp. 287 – 297. IAHS Wallingford.
30. Anyango, S. O., Tole, M. P., and Ucauwun, E. K. (1998). Groundwater resources and sea water intrusion in Kwale district. *In* Hoorweg, J. (1998) (Ed.). Dunes, Mangroves, and Birdlife in Coastal Kenya. ACTS Press, Nairobi pp. 73 – 84.
31. Mzuga, J. M., Tole, M. P., and Ucauwun, E. K. (1998). The impact of geology and pit latrines on groundwater quality in Kwale district, Kenya. *In* Hoorweg, J. (1998) (Ed.). Dunes, Mangroves, and Birdlife in Coastal Kenya. ACTS Press, Nairobi pp. 85 – 96.
32. Simiyu, G. M. and Tole, M. P. (2000). Concentrations of trace elements in waters, soils, and plants of the Olkaria geothermal field, Kenya. Proceedings of the World Geothermal Congress, Japan. CD ROM Proceedings.
33. Marani, M., Tole, M. P., and Ogallo, L. J. (2000). Concentrations of H<sub>2</sub>S in the air around the Olkaria geothermal field, Kenya. Proceedings of the World Geothermal Congress, Japan. CD ROM Proceedings.
34. Marani, M., Tole, M. P., and Ogallo, L. J. (2000). Concentrations of H<sub>2</sub>S in the air around the Olkaria geothermal field, Kenya. *Discovery and Innovation* Vol. 12 (3/4) pp. 169-178
35. Tole, M. P. (2000). Current Environmental Problems. Chapter 5 *in* Hoorweg, J., Foeken, D., and Obudho, R. A. (Eds.). Kenya Coast Handbook: Culture, resources and development in the East African littoral. LIT Verlag, Munster, Pp. 61 - 72.
36. Tole, M. P. (2001). Stable isotope compositions of some low enthalpy geothermal systems in Kenya. Proceedings of the combined RAS/8/092 and INT/0/060 coordination meeting on isotopic and geochemical techniques in geothermal exploration and reservoir management, Manila and Cebu city, Philippines. CD ROM Proceedings.
37. Tole, M. P. (2001). Preliminary water, salt, and nutrient budgets for Malindi Bay, Kenya. *In* Dupra, V., Smith, S. V., Crossland, M. J. I., and Crossland, C. J., Eds.

- Estuarine Systems of Sub-Saharan Africa: Carbon, nitrogen and phosphorus fluxes, LOICZ Reports and Studies No. 18 pp. 20 - 23. LOICZ and UNEP, The Netherlands. (<http://www.nioz.nl/loicz/>).
38. Mzuga, J. M., Tole, M. P., and Ucakuwun, E. K. (2001). Contamination of Groundwater Resources by Pit Latrines in Kwale District, Kenya. *Discovery and Innovation* 13 (3/4) 203 - 212.
  39. Tole, M. P. (2001). The Performance of a Tropical Constructed Wetland System: the Case of the Carnivore/Splash constructed wetland, Nairobi, Kenya. Pp. 55 – 62. *In Promoting Best Practices in the Conservation, Management and Sustainable Use of Water Resources in the South*. World Meteorological Organisation (WMO) and Third World Network of Scientific Organisations (TWNSO), Trieste, Italy. Pp55 – 62.
  40. Tole, M. P.; Abiero, S. O.; Ucakuwun, E. K. (2001 in Press). Contamination of Groundwater Resources by Seawater Intrusion, Kwale District, Kenya. *Discovery and Innovation* (In Press)
  41. Tole, M. P. (2002). The potential of geothermal systems in Kenya for balneological use. *Environmental Geochemistry and Health* Vol. 24(2) 103 - 110.
  42. Nyaora-Moturi, W. K.; Tole, M. P.; and Davies, T. C. (2002). The contribution of drinking water towards dental fluorosis: a case study of Njoro division, Nakuru district, Kenya. *Environmental Geochemistry and Health*. 24(2) 123 - 130.
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  44. Nzeng'ya, D. M.; Tole, M. P.; and Wangila, B. C. C. (2003). The dynamics of a benthic macro – invertebrates community in the carnivore/Splash constructed wetland, Nairobi, Kenya. *Journal of East African Natural Resources Management*. Vol. 1 No. 1 pp. 69 – 82.
  45. Mdodo, R. M.; Tole, M. P.; Obura, D.; and Muthiga, N. (2003). Environmental factors in coral bleaching: The 1997/98 El Nino in Kenya. Pp35 - 50 *In Hoorweg, J. and Muthiga, N. (2003) Eds. Recent Advances in Coastal Ecology: Studies from Kenya*. African Studies Research Report 70/2003. Leiden, Netherlands.
  46. Munyao, T. M.; Tole, M. P.; and Jungerius, P. D. (2003). Sabaki River sediment transport and deposition in the Indian Ocean. Pp 119 – 132 *In Hoorweg, J. and Muthiga, N. (2003) Eds. Recent Advances in Coastal Ecology: Studies from Kenya*. African Studies Research Report 70/2003. Leiden, Netherlands.

47. Mwakumanya, M. A. and Tole, M. P. (2003). Coastal erosion at Mombasa beaches: Hydrodynamic and morphological interactions. Pp 133 – 144 *In* Hoorweg, J. and Muthiga, N. (2003) Eds. Recent Advances in Coastal Ecology: Studies from Kenya. African Studies Research Report 70/2003. Leiden, Netherlands.
48. Muthini, M.; Tole, M. P.; and Otieno, D. (2003). Solid waste pollution loads in beach hotels on the Kenyan South Coast. Pp 153 – 170 *In* Hoorweg, J. and Muthiga, N. (2003) Eds. Recent Advances in Coastal Ecology: Studies from Kenya. African Studies Research Report 70/2003. Leiden, Netherlands.
49. Kamau, F. K. and Tole, M. P. (2003). Concentration and distribution of trace metals in mangrove sediments. Pp 269 – 280 *In* Hoorweg, J. and Muthiga, N. (2003) Eds. Recent Advances in Coastal Ecology: Studies from Kenya. African Studies Research Report 70/2003. Leiden, Netherlands.
50. Osano, O.; Nzyuko, D.; Tole, M.; and Admiraal, W. (2003). The fate of chloroacetanilide herbicides and their degradation products in the Nzoia basin, Kenya. *Ambio: A Journal of the Human Environment*: Vol. 32, No. 6, pp. 424 – 427.
51. Simiyu, G. M. and Tole, M. P. (2004). pH and variations of concentrations of some heavy metals in the infiltration ponds at Olkaria, Kenya. *African Environmental Review*. Vol. 1, No. 1, pp. 1 – 14.
52. Simiyu, G. M. and Tole, M. P. (2005). Concentrations of toxic metals Pb and Cd in selected vegetation in Hell’s Gate national Park, Kenya.

**(b) Published Abstracts:**

1. Tole, M. P. and Lasaga, A. C. (1981). Factors controlling the dissolution kinetics of nepheline. *Geological Society of America, Abstracts with Programs* Vol. 13(7) pp. 568
2. Tole, M. P. (1982). Factors controlling the kinetics of silicate – water interactions. *Dissertation Abstracts International* Vol. 43/01B pp. 69.
3. Tole, M. P. and Mathu, E. M. (1982). Trace element studies of some spheroidal rocks from the Precambrian Mozambique belt around Thika area, Kenya. *Geological Society of Africa. Abstracts for the 6<sup>th</sup> Conference on African Geology, Nairobi.*
4. Mathu, E. M. and Tole, M. P. (1982). Geology of Ithanga hills. *Geological Society of Africa. Abstracts for the 6<sup>th</sup> Conference on African Geology, Nairobi.*
5. Tole, M. P. (1982). Applications of silicate – water interaction kinetics to problems of bauxite genesis. *Abstracts for the International Seminar on Laterite, Sao Paulo.*



6. Tole, M.P. (1986). The chemistry of some low enthalpy geothermal systems in Kenya. Geological Society of Kenya. Abstracts with Programme Vol. 3(1) pp.17.
7. Tole, M. P. and M'Ragwa, J. K. G. (1987). The sweet waters of Meru district. Geological Society of Kenya. Abstracts with Programmes Vol. 4(1) pp2.
8. Tole, M. P. (1988). Deposition of metals from the Jombo hill geothermal field, Coast Province, Kenya. V. M. Goldschmidt Conference, Geochemical Society. Program and Abstracts, pp.78.
9. Tole, M. P. (1989). Environmental effects of geothermal power generation and Utilisation. Symposium on Environmental pollution and its management in eastern Africa. Faculty of Science, University of Dar es Salaam. Abstracts pp. 28.
10. Armannsson, H. and Tole, M. P. (1990). Effects of analytical uncertainties on complete fluid/mineral equilibria calculations: an example of Al. V. M. Goldschmidt Conference, Geochemical Society. Program and Abstracts, pp.29.
11. Tole, M. P. (1990). Correlation between chemically and physically transported barium anomalies over the Vitengeni lead/barite mineral deposit, Coast Province, Kenya. Abstracts for the International Symposium on Geochemical Prospecting, Prague, Czechoslovakia.
12. Tole, M. P. (1990). Chemistry and potential of low enthalpy geothermal resources in Kenya. Abstracts for the IASPE/UNESCO/IOL Regional Seismological Assembly in Africa, Nairobi.
13. Tole, M. P. (1991). Coastal sediment dynamics in a changed climate. Abstracts for the Workshop on Causes and Consequences of Sea level changes on the Western Indian Ocean Coasts and Islands, Mombasa.
14. Kunguru, K. K. and Tole, M. P. (1991). Lead pollution from motor vehicle emissions in Uasin Gishu district, Kenya. 2<sup>nd</sup> International Symposium on Environmental Geochemistry, Abstracts volume.
15. Tole, M. P. and Anyango, S. O. (1995). Sea water intrusion into domestic water supplies along the Kenyan coast. Coastal Change Bordomer 95, Bordeaux, France.
16. Tole, M. P., Munyao, T. M., and Abuodha, J. O. Z. (1995). Sediment dynamics along the Kenyan coast. Coastal Change Bordomer 95, Bordeaux, France.
17. Tole, M. P. (1995). The significance of mineral – water interaction kinetics and thermodynamics in understanding water quality. Abstracts for the Workshop on Geochemistry Applied to Water Resources Issues in Africa, Sodere, Ethiopia.

18. Tole, M. P. (1995). Some studies on pollution of natural waters in Kenya. Abstracts for the Workshop on Geochemistry Applied to Water Resources Issues in Africa, Sodore, Ethiopia.
19. Tole, M. P. and Khisa, K. (1999). The performance of the Carnivore/Splash constructed wetland, Nairobi, Kenya. Abstracts for the 4<sup>th</sup> IAWQ Specialised Conference on Small Water Treatment Plants, Straton on Avon.
20. Tole, M. P. (1999). Carbon in groundwaters in Kenya. INQUA Congress, Durban, South Africa.
21. Tole, M. P., Nyaora-Moturi, W. K., and Davies, T. C. (1999). The contribution of drinking water to dental fluorosis in Njoro division, Nakuru district, Kenya. *In* Schluter, T. and Davies, T. C. (Eds.). *Geomedicine in Eastern and Southern Africa. Abstract Volume*, pp. 27 – 28.
22. Tole, M. P. (1999). The potential of geothermal systems in Kenya for balneological use. *In* Schluter, T. and Davies, T. C. (Eds.). *Geomedicine in Eastern and Southern Africa. Abstract Volume*, pp. 34.
23. Karanja, F.K. and Tole, M. P. (1999). Available trace metal concentrations and distribution in mangrove sediments, Ngomeni, Kenya. Coastal Ecology Conference II, Mombasa Abstracts KWS/Moi University.
24. Mdodo, R. M.; Tole, M. P.; Obura, D.; and Muthiga, N. (1999). Environmental factors and coral bleaching in Kenya. Coastal Ecology Conference II, Mombasa Abstracts KWS/Moi University.
25. Munyao, T. M.; Tole, M. P.; and Jungerius, P. D. (1999). Sabaki river sediment transport and deposition in the Indian Ocean. Coastal Ecology Conference II, Mombasa Abstracts KWS/Moi University.
26. Muthini, M; Tole, M. P.; and Otieno, D. (1999). Solid waste pollution loads in beach hotels in Kwale and Mombasa districts, Kenya. Coastal Ecology Conference II, Mombasa Abstracts KWS/Moi University.
27. Mwakumanya, M. A.; Tole, M. P.; and Odhiambo, B. D. O. (1999). Coastal erosion in Kenya: implications for planning and management of the coastal zone. Coastal Ecology Conference II, Mombasa Abstracts KWS/Moi University.
28. Tole, M. P., and Shitsama, J. M. (2000). Contamination of heavy metals in water, fish and sediments of the Winam Gulf, Lake Victoria. Conference on Lake Victoria 2000: A New Beginning. Jinja, Uganda.
29. Mogere, S. N.; Osano, O.; Nzyuko, D. M.; Oldimeji, A. A.; and Tole, M. P. (2000). *Chironomus (Diptera:chironomidae)* larval head deformities as biomarkers for

- pollution monitoring along river Nzoia. Conference on Lake Victoria 2000: A New Beginning. Jinja, Uganda.
30. Nzyuko, D. M.; Tole, M. P.; Oldimeji, A. A.; Osano, O.; and Mogere, S. N. (2000). Contamination of River Nzoia by alachlor, metolachlor and their degradation products. Conference on Lake Victoria 2000: A New Beginning. Jinja, Uganda.
  31. Tole, M. P. (2000). The self-cleansing capacity of a tropical waste receiving river. Conference on Managing Water and WasteWater in the New Millennium. Midrand, South Africa.
  32. Tole, M. P., and Simiyu, G. M. (2000). Concentrations of trace elements in waters, soils, and plants of the Olkaria geothermal field, Kenya. World Geothermal Congress 2000, Japan.
  33. Tole, M. P., and Marani, M. (2000). Concentrations of H<sub>2</sub>S in air around the Olkaria geothermal field, Kenya. World Geothermal Congress 2000, Japan.
  34. Nzyuko, D. M., Mogere, S. N., Tole, M. P., Oladimeji, A. A., and Osano, F. O. (2001). Contamination of R. Nzoia by aniline pesticides and their degradation products: lessons for the environmental management of enclosed coastal seas. The 5<sup>th</sup> International Conference on the Environmental Management of Enclosed Coastal Seas. Kobe, Japan.
  35. Tole, M. P. and Shitsama, J. (2002). Concentrations of heavy metals in water, fish, and sediments of the Winam Gulf, Lake Victoria, Kenya. International Symposium on Comparing Great Lakes of the World (GLOW III), Arusha, Tanzania.
  36. Tole, M. P. (2002). Environmental Impacts of the Olkaria geothermal Power Station, Kenya. Combined KenGen/IAEA Geothermal Conference and INT/0/060 Coordination Meeting on Isotopic and Geochemical Techniques in Geothermal Exploration and Reservoir Management, Nairobi, Kenya.
  37. Tole, M. P. and Simiyu, G.M. (2002). Removal of acidity, alkalinity, and heavy metals in the infiltration ponds at Olkaria East geothermal Power Station, Kenya. Combined KenGen/IAEA Geothermal Conference and INT/0/060 Coordination Meeting on Isotopic and Geochemical Techniques in Geothermal Exploration and Reservoir Management, Nairobi, Kenya.
  38. Simiyu, G. M.; Tole, M. P.; and Davies, T. C. (2003). Concentrations of selected metals in soils, grass and health implications for grazing wild animals in Hell's Gate National Park, Kenya. 2<sup>nd</sup> KenGen Geothermal Conference, UNEP Headquarters, Nairobi, Kenya, Abstracts p. 27

39. Arusei, M. K., Sanga, J. K.; and Tole, M. P. (2003). The outflow of Lake Naivasha based on the stable isotope composition of groundwater. 2<sup>nd</sup> KenGen Geothermal Conference, UNEP Headquarters, Nairobi, Kenya, Abstracts p. 28

**(c) Unpublished Reports:**

1. Tole, M. P. (1978). Preliminary report on soil geochemical studies of the Vitengeni barite lead mine, Kilifi district, Kenya. Unpublished report of the Mines and Geology Department, Nairobi, Kenya.
2. Tole, M. P. (1979). The uranium content of zircons from the Catskill formation, eastern Pennsylvania. Unpublished MS thesis, Pennsylvania State University, U.S.A.
3. Rose, A.W., Pirc, S., Tole, M. P., Bell, C., Keith, M. L., and Pilione, L. (1980). Regional and local anomalies of uranium and thorium in rocks near sandstone – type uranium deposits of Pennsylvania and Colorado (U.S.A.). Report 1980 GJBS 126(80). US Department of Energy. 211 pp.
4. Tole, M. P. and Lasaga, A. C. (1981). Dissolution mechanism and dissolution kinetics of nepheline, NaAlSi<sub>3</sub>O<sub>8</sub>, a sodium host phase for defence waste ceramics. PSU – 0222. US Department of Energy. 79 pp.
5. Tole, M. P. (1982). Factors controlling the kinetics of silicate – water interactions. Unpublished Ph.D. thesis, Pennsylvania State University.
6. Tole, M. P. and Wachira, J. K. (1982). The geology of the area south of Nairobi. Guidebook to the 6<sup>th</sup> Conference on African Geology, Post Conference Field Excursion, Geological Society of Africa. 27 pp.
7. Tole, M. P. (1985). Geochemical studies of the geothermal area east of the Jombo hill intrusion, Coast Province. Report on Project NCST/SEC/4400. 341. National Council for Science and Technology, Nairobi, Kenya. 20pp.
8. Tole, M. P. (1986). Guide to Tsavo area. Guidebook to the 3<sup>rd</sup> Annual Conference on the Geology of Kenya, Post – Conference Field Trip, Geological Society of Kenya, 16 pp.
9. Tole, M. P. (1986). Geochemical studies of low enthalpy geothermal areas of Kenya: Report on a reconnaissance study. Restricted Technical Report on UNDP Project KEN/82/002, Nairobi, Kenya. 33 pp.
10. Niini, H., Reijo, S., Tole, M. P. and Wairegi, W. J. (1987). Evaluation of the industrial minerals project in Kenya. Phase II. Consultancy report to FINNIDA, Nairobi 38 pp.

11. Tole, M. P. (1988). Diatomite processing at Namafjall, Iceland. Report to the UNU geothermal training programme, Orkustofnun, Iceland. 7 pp.
12. Tole, M. P. (1988). Geochemical sampling, laboratory analysis, and mineral equilibria calculations for fluids from selected areas in Iceland. Report 1988 – 7 of the UNU geothermal training programme, Orkustofnun, Iceland. 52 pp.
13. Tole, M. P. (1990). Geochemical studies of low temperature areas of Kenya. Final report for project NCST/5.003/F/5 of the National Council for Science and Technology, Nairobi, Kenya, 28 pp.
14. Tole, M. P. (1998). (Ed.). Proceedings of the workshop on LVEMP training and research needs assessment. LVEMP Capacity Building Component, Moi University.
15. Tole M. P., and Colleagues (2000). Environmental Impact Assessment of the Olkaria III geothermal energy plant. Report to Orpower 4 Inc., 150 pp.
16. Tole, M. P. (2001). Supplementary Report to the Environmental Impact Assessment Study (August, 2000) Regarding High Tension Transmission Lines and Well Pads for the Orpower Olkaria III geothermal Development. Report to Orpower 4 Inc., 12 pp.
17. Tole, M. P. and Colleagues (2004). Environmental Audit Olkaria III geothermal energy plant. Report to NEMA, 60 pp.
18. Tole, M. P. (2004). Comment on the Magadi Ash Plant Environmental Audit of July 2002. Report to Maa Christian Council, 5pp.
19. Tole, M. P. (2004). Science, Environment, and Sustainable Development. Report to Science Agenda – Framework for Action. 7pp.
20. Tole, M. P. (2004). Environmental Policy in Africa. Report to ACTS. 22pp.
21. Tole, M. P. (2005). Lessons Learnt Report – Water Hyacinth. Report to KARI/LVEMP. 32pp.
22. Tole, M. P. (2006). Comments on Reports on “National Management Framework: Monitoring and Communication for the Lake Victoria Basin”. Reviewer Reports to the Ministry of Environment and Natural resources 5pp.
23. Tole, M. P., Atamba, G. M. and Tunje J. G. (2007). Project documents for Lamu and Tana-Malindi-Mida creek seascapes as major components of the WWF - EARPO Marine Programme for Kenya

24. Tole, M.P. (2007). Environmental Impact Assessment for the Olkaria III Geothermal Energy Project Addenda. Report done for Orpower 4 Inc. and presented to NEMA

**(c) Invited Papers:**

1. Tole, M. P. (1985). Tracers in Geochemistry. IAEA Regional Training Course in Radiochemistry and Analytical Techniques in Nuclear Science, Nov./Dec. 1985, Nairobi.
2. Tole, M. P. (1985). Analytical Techniques in Mineral Resources. IAEA Regional Training Course in Radiochemistry and Analytical Techniques in Nuclear Science, Nov./Dec. 1985, Nairobi, Kenya.
3. Tole, M. P. (1987). Geochemistry of low enthalpy geothermal areas in Kenya. UNDP/DTCD Technical Review Meeting on Exploration for Geothermal Energy, February, 1987, Nairobi, Kenya.
4. Tole, M. P. (1989). Geothermal Energy. First Annual Research Workshop on Meteorological Applications and Services, September, 1989, Nairobi, Kenya.
5. Tole, M. P. (1994). Potential Environmental impacts in the Tsavo – Galana – Sabaki water shed and river system. Workshop on the Environmental Impact Assessment of the Second Mombasa and Coastal Water Supply Engineering and Rehabilitation Project, April, 1994, Tsavo, Kenya.
6. Tole, M. P. (1994). The role of External Cooperation in Capacity Building. Workshop on Traditional Techniques of Microclimate Improvement Project, April, 1994, Nairobi, Kenya.
7. Tole, M. P. (1996). Official Opening Address, Environment and Urban Development Training Project; Special topic workshop on Environmental Impact Assessment, January, 1996, Nakuru, Kenya.
8. Tole, M. P. (2002). Isotope hydrology and its development in Kenya. IAEA/KenGen Scientific Conference on the use of isotopes in geothermal reservoir management. Nairobi, Kenya March 2002.

**RESEARCH INTERESTS:**

1. Environmental Impact Assessment.
2. Waste Management.
3. Water Resources Quality and Management
4. Geothermal Energy Resources.
5. Kinetics/Thermodynamics of Water/Rock Interaction.
6. Environmental Education.

## **SUPERVISION AND EXAMINATION OF POSTGRADUATE THESES.**

### **(a). Supervisor/Co – Supervisor of 32 Masters and 6 Doctoral theses as follows:**

1. Onacha, S. A. (1989). An electrical resistivity study of the area between Mt. Suswa and the Olkaria geothermal field, Kenya. MSc. Thesis, University of Nairobi, 1989, 177 pp.
2. Masibo, M. N. (1990). A study of the hydrogeology, solid waste disposal, and river water pollution in the Nairobi area. MSc. Thesis, University of Nairobi, 1990, 149 pp.
3. Abba – Kaka, A. (1990). Ore mineralisation of two hot springs near Jombo hill in the south coast area of Kenya. MSc. Thesis, University of Nairobi, 1990, 145 pp.
4. Chege, K. T. (1990). Ground water chemistry in the Timboroa area. MSc. Thesis, University of Nairobi, 1990,
5. Tiberindwa, V. S. (1990). Stream sediment geochemistry of the Edzawa River, Kakamega district, Western Kenya.
6. Shivoga, W. A. (1991). Relationship between environmental factors and phytoplankton species composition and biomass in Kesses dam, a tropical man made reservoir. MPhil. Thesis, Moi University, 1991.
7. Kunguru, K. K. (1991). The effect of vehicular traffic on environmental lead levels in Kesses division, Uasin Gishu district, Kenya. MPhil. Thesis, Moi University, 1991.
8. Munyao, T. M. (1992). Sedimentology of the Shirazi – Funzi lagoon, Coast province, Kenya. MPhil. thesis, Moi University, 1992
9. Odongo, C. S. P. (1994). Levels of mercury in Kesses dam, Endaragwa, Endaragweti, Sambul, and Sosian rivers in Uasin Gishu district. MPhil. Thesis, Moi University, 1994.
10. Simiyu, G. M. (1994). Levels of trace elements in Olkaria geothermal fluids, and their implications to the environment. MPhil. Thesis, Moi University, 1994.
11. Marani, M. (1996). Levels of hydrogen sulfide (H<sub>2</sub>S) at the Olkaria geothermal power plant and its surroundings. MPhil. Thesis, Moi University, 1996.
12. Anyango, S. O. (1996). Groundwater quality assessment with reference to salt-water intrusion: a case study of boreholes in Kwale district. MPhil. Thesis, Moi University.

13. Khisa, K. (1997). Efficiency of a wetland waste water treatment system at the Carnivore/Splash centre in Langata, Nairobi, Kenya. MPhil. Thesis, Moi University.
14. Kebeney, J. K. (1997). The effects of tannery effluents on water quality of river Kasarani, Nairobi, Kenya. MPhil. Thesis, Moi University, 1997.
15. Nzeng'ya, D. (1997). Benthic macroinvertebrate fauna of a constructed wetland of Carnivore restaurant, Nairobi, Kenya. MPhil. Thesis, Moi University, 1997.
16. Karanja, F. (1998). Ecological studies of mangrove forests on tidal flats and lagoons, Ungwana bay, Kenya coast. MPhil. Thesis, Moi University, 1998.
17. Nyaora – Moturi, W. K. (1998). The contribution of drinking water to dental fluorosis: a case study of Njoro division, Nakuru district, Kenya. MPhil thesis, Moi University, 1998.
18. Ndagijimana, A. (1999). The impact of Eldoret municipal effluents and agricultural activities on Sosian river: Public health aspects. MPhil. Thesis, Moi University, 1999.
19. Shitsama, J. M. (1999). Bioaccumulation of heavy metals contaminants in *Lates niloticus*, *Rastineobola argentea*, and *Oreochromis niloticus* in lake Victoria (Kenya). MPhil. Thesis, Moi University. (1999).
20. Mdodo, R. M. (1999). Environmental factors responsible for coral reef bleaching in Kenya. MPhil. Thesis, Moi University. (1999).
21. Gitahi, S. M. (1999). Organochlorinated and organophosphorus insecticide concentrations in water, sediment, and selected organisms in Lake Naivasha (Kenya). MPhil. Thesis, Moi University. (1999).
22. Gatubu, L. W. (1999). Concentration of heavy metals in fresh fruits and vegetables arising from motor vehicle emissions. MPhil. Thesis, Moi University (1999).
23. Mwakumanya, M. (2000). The impact of waves on beach morphology in Nyali and Kenyatta beaches, Mombasa. MPhil. Thesis, Moi University (2000).
24. Mogere, S. N. (2000). Morphological stability in *Chironomus* (Diptera: *Chironomidae*) for pollution monitoring along river Nzoia. MPhil. Thesis, Moi University. (2000).
25. Nzyuko, D. M. (2000). Contamination of river Nzoia by alachlor, metalochlor, and their degradation products. MPhil. Thesis, Moi University, (2000).
26. Muthini, M. (2000). Solid waste pollution loads in beach hotels in Mombasa and Kwale districts, Kenya. MPhil. Thesis, Moi University (2000).



27. Otieno, E. O. (2001). Ground water quality in Kisumu town. MPhil. Thesis, Moi University, (2001).
28. Wesonga, T. E. O. (2001). Levels of heavy metals and some preservatives in milk and milk products under a liberalised market. MPhil. Thesis, Moi University (2001).
29. Kirui, A. (2002). Pathogenic microorganisms and water quality of Nyando river and its wetlands in Lake Victoria basin. MPhil. Thesis, Moi University (2002).
30. Oluchiri, S. (2002). The use of municipal wastes in energy generation: the case of Eldoret and Kisumu Municipalities. MPhil. Thesis, Moi University (2002).
31. Koech, W. K. (2003). Assessment of water quality parameters and selected metals of Dionsoyiet River, Kericho municipality. M.Phil Thesis, Moi University (2003).
32. Nyagah, E. M. (2006). A numerical model for determining the dispersion of hydrogen sulphide plume from a stationary point source (Olkaria geothermal power station, Kenya). MSc Thesis Kenyatta University, (2006).
33. Mzuga, J. M. (2007). The impact of geology and pit latrines on ground water quality: a case study of boreholes in Kwale district. MPhil. Thesis, Moi University (2007).
34. Wandere, J. (ongoing). The efficiency of macrophytes in water quality improvements in the Nyando river wetland, Lake Victoria, Kenya. MPhil. Thesis, Moi University, (ongoing).
35. Otieno, M. (ongoing). Pesticide and heavy metal pollution in the Gucha river wetlands, Kenya. MPhil. Thesis, Moi University, (ongoing).
36. Muitherero, B. (ongoing). Trace element status of Hell's Gate national park, Naivasha, Kenya. MPhil. Thesis, Moi University, (ongoing).
37. Sabatia, A. A. (ongoing). Environmental Plan for the Menengai geothermal resource development, Nakuru, Kenya. M.Phil. Thesis, Moi University, (ongoing).
38. Kombe, F. K. (ongoing). A Study of Waste Generation and Management for both Ship and Offshore Operations at the Port of Mombasa, Kenya. MPH Thesis, Kenyatta University. (Ongoing).
39. Mutisya, D. K. (submitted). The impact of irrigated agriculture on river water quality: a case study of Ontulili subcatchment of Ewaso Ng'iro North Basin. MES Thesis, Kenyatta University, (submitted).

40. Mahungu, R. M. (submitted). Trace element concentrations in vegetables grown using sewage waters in Nairobi, Kenya MES Thesis, Kenyatta University (submitted)
41. Maina, B. (ongoing). Assessment of wind energy potential in Makindu and Thika Divisions. MES Thesis, Kenyatta University, (ongoing).
42. Wafula, M.N. (ongoing). Electricity conservation in Kenyatta University. MES Thesis, Kenyatta University, (ongoing).
43. Wekesa, A. Marabu (ongoing). Life cycle analysis of the sugar industry in Kenya. MES Thesis, Kenyatta University, (ongoing).
44. Masaku, Margaret K. (submitted). Solid Waste Management Practices in Urban Municipalities in Kenya: a case study of Machakos Town. MES Thesis, Kenyatta University, (submitted).
45. Karagu, Sophie. Modelling of Nairobi river pollution using dispersion models. MSc. Thesis, Kenyatta University, (ongoing).
46. Orwa, Martin Ondego (ongoing). Influence of water and sediment quality on the biodiversity of macroinvertebrates in Kisat River, Kenya. MES Thesis, Kenyatta University (ongoing).
47. Mwanthi, J. M. (ongoing). Influence of sanitation waste on groundwater quality within Machakos Town. MES Thesis, Kenyatta university (ongoing).
48. Abuodha, J. O. Z. (2000). Geomorphology and sedimentology of the area influenced by the Sabaki sediments – implications for dune dynamics. PhD. Thesis, University of Amsterdam (2000).
49. Simiyu, G. M. (2000) Levels of selected trace elements in the Olkaria geothermal field, and their potential toxicity to resident grazing wild animals in Hell's Gate national park, Kenya. DPhil. Thesis, Moi University (2000).
50. Munyao, T. M. (2001). Sedimentology of the Sabaki river sediments in the Malindi – Mambui area, coastal Kenya. DPhil. Thesis, Moi University (2001).
51. Arusei, M. (2002). The hydrology of Lake Naivasha basin from stable isotope studies: implications for the environment and geothermal power generation. DPhil. Thesis, Moi University (2002).
52. Madara, D. S. (2007). A case study on cleaner production potential at Rupa Woolen Textile Mill, Eldoret, Kenya. DPhil. Thesis, Moi University (2007).

53. Gathuru, G. (ongoing). Rehabilitation of mine sites at East African Portland cement, Athi River, Kenya. PhD thesis, Kenyatta University (ongoing).
54. Chibole, K. K. (ongoing). A conceptual model. A scientific approach for River Sosiani water quality management. DPhil. Thesis, Moi University (ongoing).
55. Ojok, J. (ongoing). Municipal solid waste management challenges and opportunities: a case of Kampala city, Uganda. PhD thesis, Kenyatta University (ongoing)

**(b). Served on the boards of examiners for over 100 Masters and 20 doctoral theses, either as supervisor, examiner, or Chairman of the Board of Examiners.**

**(c). Reviewing of Publications for Journals/Conferences /Publishers/Funding Agencies.**

1. Kenya Journal for Science and Technology Series A. Physical and Chemical Sciences
2. Discovery and Innovation
3. University of Nairobi Press
4. Applied Geochemistry
5. Journal of African Earth Sciences
6. International Science Foundation (USA)
7. African Journal of Science and Technology
8. Environmental Geochemistry and Health
9. African Environmental Review
10. Tanzania Journal of Science
11. Ambio
12. Estuarine Coastal and Shelf Science
13. Journal of East African Natural Resources Management
14. International Foundation for Science (Sweden)
15. Africa Geoscience Review

16. Journal of the Kenya Chemical Society
17. Egerton Journal: Science and Technology Series
18. Water Science and Technology
19. International Water Association
20. Intergovernmental Panel on Climate Change (IPCC) Working Group II Fourth Assessment Report
21. World Health Organisation (WHO)

**(d). Developing Curricula at University Level:**

Described courses in geochemistry and geological thermodynamics at the Department of Geology, University of Nairobi. Revised and updated several undergraduate and postgraduate courses at the same institution. Described 18 post graduate courses in Physical Sciences at the School of Environmental Studies, Moi University, and an undergraduate course in geochemistry at the Department of Chemistry, Moi University. Revised and introduced new curricula at Kenyatta University, Department of Environmental Sciences.

**(e). External Examiner for University Programmes:**

1. University of Nairobi, Department of Geology, 1993.
2. University of Manchester, Department of Earth Sciences (PhD. thesis), 1995
3. University of Nairobi, Department of Meteorology (PhD. thesis), 1999.
4. University of Zambia (MSc. Thesis), 2000
5. University of Dar es Salaam (MSc. Thesis), 2001, 2004, 2008
6. Maseno University, Department of Environmental Studies, 2002 – 2008
7. Egerton University, Department of Environmental Science, 2003 – 2008
8. Makerere University (MSc. Thesis), 2004
9. University of Nairobi, Department of Geology, 2006 – 2007
10. Moi University, Faculty of Science (MPhil Thesis), 2007
11. Egerton University, Department of Environmental Science, 2007 (3 masters, 2 PhD)

**(f). External Examination of Other Programmes:**

1. Kenya Wildlife Service Training Institute, Diploma in Environmental Management 2005 – Present.

**REFERENCES:**

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3. Prof. David Manning, Professor of Soil Science, School of Civil Engineering and Geosciences, University of Newcastle, Newcastle upon Tyne, NE1 7RU, U.K. e-mail: [david.manning@ncl.ac.uk](mailto:david.manning@ncl.ac.uk) telephone (+44) 0191 222 7893