

## CURRICULUM VITAE

### Personal data

Name : Prof. Nancy K.N. Karanja  
Profession : Soil Scientist  
Current position: Professor  
Postal Address: P.O. Box 51939-00200, Nairobi  
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### Thesis

N.K. Mureria, 1979. Population dynamics of soil microorganisms in termite mound soils in Kenya. M.Sc. Thesis, University of Nairobi.

N.K. Karanja, 1988. Selecting *Rhizobium phaseoli* strains for use with beans (*Phaseolus vulgaris* L.) in Kenya. Ph.D Thesis, University of Reading.

<u>Employment</u>	<u>Place</u>	<u>Period</u>
Senior Research Officer	Kenya Agricultural Research Institute, (KARI)	1989-90
Principal Research Officer	Kenya Forestry Research Institute, (KEFRI)	1990-93
Senior Lecturer	University of Nairobi, (UoN)	1993-2000
Associate Professor	University of Nairobi (UoN)	2000-2007
Professor	University of Nairobi	25 <sup>th</sup> Feb, 2007
Consultant	Urban Harvest-International Potato Centre	2004 to-date

### Other Responsibilities

- Chairperson, Department of Soil Science, Faculty of Agriculture, 1996 – June, 2002.
- Director, Microbial Resource Centre (MIRCEN) Nairobi..
- President, African Association for Biological Nitrogen Fixation (AABNF).
- Country Technical Coordinator and member of the Global Project Steering Committee (PSC , UNEP-GEF on Conservation and Sustainable Management of Belowground Biodiversity (BGBD) project.
- Reviewer manuscripts for Agronomy, Environment and Ecosystems, Plant and Soil, Environment Research Letters
- Review of projects for Rockefeller Foundation (upto 2007), IDRC (Canada)- till 2010, AGRA (to date)
- Coordinator, Solid Waste Management Network (WASTENET)
- Council Board Member, St Paul University ,Limuru
- Vice Chairperson, PCEA HIV/AIDS Council

### Research Projects

#### 1. Biological Nitrogen Fixation:

- a) Biodiversity and populations of indigenous rhizobia populations in soils of East and Southern Africa.
- b) On-farm trials on the effects of rhizobia inoculants on performance of grain legume.

- c) Improvement of the rhizobia inoculant production and utilization by the smallholder farmers within Eastern and Southern African region.
- d) Distribution, abundance and diversity of nematodes associated with common bean (*Phaseolus vulgaris L.*) and their effects on bean growth and nodulation in smallholder farms in Kiambu and Siaya, Kenya.
- e) Urban solid waste management, urban and peri-urban agriculture programmes.
- f) Improvement of sweetpotato production through integrated approaches.

## **2. Soil fertility:**

- a) Management of organic residues for maintenance of soil fertility by farmers in Central Kenya
- b) Agronomic effectiveness of phosphate rocks on agroforestry tree species.
- c) Assessment of improved fallows for soil fertility improvement in W. Kenya.
- d) Effects of organic amendments on soilborne pests, diseases and beneficial organisms.

## **3. Environmental management:**

- a) Development of organic based fertilizers from agro-based waste products through composting and fertilizer justifications.
- b) Evaluation of the ability of vertisols to remove nutrients from pond effluents at the Sagana Fisheries.
- c) Urban waste management: Potential of urban waste treatment and use to enhance productivity and sustainability of rural, peri-urban agriculture.
- d) Development and delivery of a training module on solid waste and urban agriculture for the Anglophone, Africa Regional Training Course on urban and peri-urban agriculture organised by Urban Harvest (CGIAR system wide initiative on urban and peri urban agriculture) and others. Participation in the on-going Urban Harvests' urban and peri-urban activities in Nairobi.

## **4. Private sector and farmers linkages**

- a) Consulting for KEMPHIS and KARI - assessment of newly introduced bio-fertilizer on their efficacy and effect on soil biological issues.
- b) Advisory services to farmers on soil related matters e.g. fertility assessment.
- c) Collaborating with Homegrown Ltd. on Research and Development issues.
- d) Evaluation of MAVUNO fertilizer formulations on farmers fields jointly with the Athi River Mines Ltd.
- e) Advocacy in farmer FOR A for policy change to accommodate urban and peri-urban agriculture in SSA countries

## **Areas of Teaching in both B.Sc and M.Sc Programmes**

1. Soil fertility and microbiology.
2. Soil organisms and biochemistry.
3. Degradation of synthetic and organic molecules.
4. Pesticide microbiology and geochemical cycles leading to environmental pollution.

**Postgraduate Supervised Projects:** Supervised 50 MSc and 10 PhD thesis

## **Membership in Scientific Organizations**

1. Member of Soil Science Society of East Africa (SSSEA), ISSSS.
2. President of African Association of Biological Nitrogen Fixation (AABNF).

3. Member of African Crop Science Society (ACS).
4. Member of African Network for Agroforestry Education (ANAFE) .
5. Member of Rhizobium Ecology Network for East and Southern Africa (RENEASA).
6. Member of Kenya Microbiology Society (KMS).
7. Member of Urban Waste Management (WASTENET) task force (Nairobi).

### **Grants and Contracts and Fellowships**

1. The Ecology of indigenous Rhizobia populations in soils of Eastern and Southern Africa: Network Approach (RENEASA)
2. Organic matter management in smallholder farmers in Central Kenya Highlands.
3. Evaluation of the agronomic effectiveness of phosphate rock fertilizers through the use of
4. Nuclear and related techniques: Evaluation of P availability from Minjingu phosphate rock using selected agroforestry trees species.
5. Use of fresh water pond effluents for production of horticultural crops
6. Population diversity of *Bradyrhizobia* in selected Kenya soils
7. Distribution, abundance and diversity of nematodes associated with common bean (*Phaseolus vulgaris L.*) and their effect on bean growth and nodulation in smallholder farms, Kiambu and Siaya districts, Kenya.
8. Landuse change, agrobiodiversity and global environmental benefits. Coordinated by the Tropical Soil Biology and Fertility Programme (TSBF) of UNESCO
9. UNESCO-fellowships to offer short term attachments to 5 fellows from Senegal (2), Sudan (2), and Zambia (1) in the MIRCEN laboratory to familiarise themselves with the rhizobia inoculant production technology (offered from 1995-1999).
10. Visiting UNESCO-BAC fellowship to: (a) Rwanda to assess the infrastructural and Human Resource requirements of ISAR's Biological Nitrogen Fixation (BNF) in 1997 and (b) Sudan to conduct rhizobia inoculant production and quality control training course and as well as assessing the requirements of the ENRRI-BNF laboratory in 1998.
11. Regional Training Course on "Rhizobium Inoculant Production and Quality Control" held in Marondera, Zimbabwe. Attended by 20 participants from 10 African countries. Funded by Dutch Special Biotechnology
12. Sustainable Management and Conservation Belowground Biodiversity GEF-UNEP (GF 2715-02)
13. Effect of land use changes on belowground biodiversity and soil productivity in Embu and Kakamega agro-ecosystems. Vicres funded for 3 year.
14. Urban Waste Management Network (WASTENET), 2002.
15. Local Participatory Research and Development on Urban Agriculture and Livestock Keeping in Nakuru. March -December 2005, LPP-DFID programme. Urban Agriculture
16. Research and Development Centre in Nakuru in 2004.
17. Management of organic waste and livestock manure for enhanced livestock production in the Urban and Peri-urban Nairobi, 2003
18. Development of an effective and efficient networking and information strategic plan for the waste managers in Nairobi, 2003.
19. Assessment of Benefits and risks in waste water reuse for agriculture in urban and peri urban areas of Nairobi. October 2005 to October 2007.
20. Enhancing Livelihoods of the Youth through recycling of organic waste for Energy Briquette making at Kahawa Soweto Informal settlement, Nairobi .Sept 2006 to Sept 2007
21. Turning environmental burdens into livelihoods benefits: building sustainable neighbourhoods through recycling, agro-enterprises and a cohesive community in Kampala, Uganda. July 2006 to July 2009

22. Combating HIV/AIDS in urban communities through food and nutrition security: The role of women led micro-livestock enterprises and horticultural production in Nakuru town June 2006 to June 2008.
23. Achieving Impact at Scale through Nutrition-focused Marketing: Understanding How Expanding Collective Access to Markets for African Indigenous Vegetables (AIVs) and Orange-Fleshed Sweet Potatoes (OFSP) Enhances Rural and Urban Well-Being. Funded by Kilimo Trust in 2007-2009.
24. Enhanced Rural-Urban trade efficiency and environmental management based on a Business model.
25. Sustainable Management and Conservation Belowground Biodiversity in the Mau Ecosystem, Kenya. GEF-UNEP
26. Potential of productive and multiple water and waste (re-) use in Kajiado district. Dutch Alliance and Kenya Alliance. 2012-2015
27. Mapping the mind of consumers and traders of fresh vegetables at open-air markets with respect to food safety and security in Kenya: An application of the Zaltman Metaphor Elicitation Technique (ZMET).SLU/University of Nairobi/Gamma Systems Ltd. 2012-2014
29. Evaluating ways of developing a fertilizer product from human excreta Peepoople/University of Nairobi/Gamma Systems Ltd. 2012-2013
30. Putting Nitrogen Fixation to Work for Smallholder Farmers in Africa (N2Africa).Project funded through Bill and Melinda Gates Foundation and as NARS and collaborating Rhizobium research in East , Central and West Africa. Duration 2010-2018
31. Improved food and nutrition security and economic empowerment of women farmers through promotion of diseases free cassava planting materials in an integrated cassava and legume intercrop in Kenyan Coast. Funded by Kenya government through National Council for Science and Technology. Duration 2011-2013.
32. Improving bean yields by reversing soil degradation and reducing soil borne pathogens on small-holder farms in Western Kenya. Partnerships: University of Nairobi/Cornell University/IITA Funded by USDA- Common Bean Productivity Research (BPR) for Global Food Security, Number: 2012-03602: Duration 2012-2016
33. Closing the urban-rural nutrient cycle: From waste to increased agricultural productivity. Partnerships; University of Nairobi/ Taka Taka Solutions/ Farm Shop. Funded by USAID- Development Innovation Ventures Duration 2013-2015
34. Improved Soil Fertility Management for Sustainable Intensification in Potato Based Systems in Ethiopia and Kenya..Partnerships: International Potato Centre(CIP) Regional Office-SSA, University of Gottingen ,University of Kassel, University of Nairobi and Ethiopian Institute of Agricultural Research(EIAR). GIZ/BMZ Technical Cooperation for Euro 1.2m for 4 yrs (2014-2017).
35. Increasing the quality and availability of BIOFIX legume inoculant and Sympal fertilizer blend to smallholder farmers in Kenya. Partnership: MEA Fertilizer Company, WeRate Farmer Association, University of Nairobi (MIRCEN). USAID Feed the Future Programme for USD 500000. Duration 2014-2016
36. Participatory evaluation of the efficacy and market evaluation of Plantmate organic fertilizers and prime Ec foliar plant food for smallholder farmers.Wanda Organics and University of Nairobi. USAID Feed the Future for US\$100000 from 2014-2015

## Scientific Publications

1. Mary Njenga, James Gitau ,Miyuki Iiyamaa , Ramni Jamnadassa ,Yahia Mahmoud and **Nancy Karanja** (2019).Innovative biomass cooking approaches for sub-Saharan Africa. *Agric. J.Food Nutri. Dev.* 19(1) 14066-14087
2. Nduhiu G.,Gicheru M. M., Gathura P. B., **Karanja N. K.**, Githinji W. T. and Nordin A. (2018) .Internalization of enteropathogenic human bacteria in lettuce and coriander plant tissue. *ISABB Journal of Health and Environmental Sciences* Vol. 5(3), pp. 28-32.DOI: 10.5897/ISAAB-JHE2018.0043
3. .Harun I. Gitari & Charles K. K. Gachene &**Nancy N. Karanja** & Solomon Kamau &Shadrack Nyawade & Elmar Schulte-Geldermann (2019).Potato-legume intercropping on a sloping terrain and its effects on soil physico-chemical properties. *Plant Soil* <https://doi.org/10.1007/s11104-019-04036-7>
4. Shadrack O. Nyawade, Charles K.K. Gachene , **Nancy N. Karanja** , Harun I. Gitari ,  
5. Elmar Schulte-Geldermann Monica L. Parker (2019).Controlling soil erosion in smallholder potato farming systems using legume intercrops. *Geoderma Regional* 15 (2019) e00225
- C. O. Oduor, **N. K. Karanja**, R. N. Onwonga, S. M. Mureithi, D. Pelster and G. Nyberg (2018) . Enhancing soil organic carbon, particulate organic carbon and microbial biomass in semi-arid rangeland using pasture enclosures. *BMC Ecology* (2018) 18:45. <https://doi.org/10.1186/s12898-018-0202-z>
6. Collins O. Oduor<sup>1</sup>,**Nancy Karanja**, Richard Onwong'a, Stephen Mureithi, David Pelster and Gert Nyberg (2018). Pasture enclosures increase soil carbon dioxide flux rate in Semiarid Rangeland, Kenya. *Carbon Balance and Management* 13:12-24 <https://doi.org/10.1186/s13021-018-0114-4>)
7. Solomon Kamau , Edmundo Barrios , **Nancy K. Karanja** , Fredrick O. Ayuke , Johannes Lehmann (2017).Soil macrofauna abundance under dominant tree species increases along a soil degradation gradient. *Soil Biology & Biochemistry* 112 (2017) 35-46.
8. Solomon Kamau, Edmundo Barrios, **Nancy K. Karanja**, Fredrick O. Ayuke, Johannes Lehmann (2017). Spatial variation of soil macrofauna and nutrients in tropical agricultural systems influenced by historical charcoal production in South Nandi, Kenya. *Applied Soil Ecology* 119:286-293.
9. Harun I. Gitari, Charles K.K. Gachene, **Nancy N. Karanja**, Solomon Kamau, Shadrack Nyawade, Kalpana Sharma, Elmar Schulte-Geldermann (2018).Optimizing yield and economic returns of rain-fed potato (*Solanum tuberosum* L.) through water conservation under potato-legume intercropping systems. *Agricultural Water Management* 208:59-66.
10. Nduhiu G., Gicheru M. M., Gathura ,P. B., **Karanja N. K.**, Githinji W. T. and Nordin A. ( 2018) .Internalization of enteropathogenic human bacteria in lettuce and coriander plant tissue .*ISABB Journal of Health and Environmental Sciences* Vol. 5(3), pp. 28-32.
11. Shadrack O. Nyawade, **Nancy N. Karanja**, Charles K.K. Gachene, Elmar Schulte-Geldermann, Monica Parker (2018).Effect of potato hilling on soil temperature, soil

- moisture distribution and sediment yield on a sloping terrain .Soil & Tillage Research 184:24-36.
12. Shadrack Nyawade, **Nancy Karanja**, Charles Gachene ,Monica Parker and Elmar Schulte-Geldermann (2018). Susceptibility of soil organic matter fractions to soil erosion under potato-legume intercropping systems in central Kenya. Journal of Soil and Water Conservation Society 75(5)567-575.
  13. Joyce Aguk,**Nancy Karanja**,Elmar Schulte-Geldermann and Christian Bruns (2018). Control of bacterial wilt (*Ralstonia solanacearum*) in potato (*Solanum tuberosum*) using rhizobacteria and arbuscular mycorrhiza fungi.Jornal of Food,Agriculture and Development 18(02)13372-13388.
  14. Reis S, Bekunda M, Howard CM, **Karanja N**, Winiwarer W, Yan X, Bleeker A, Sutton MA (2016) Synthesis and review: Tackling the nitrogen management challenge: from global to local scales. Env Res Let 11, 120205.  
<http://iopscience.iop.org/article/10.1088/1748-9326/11/12/120205>
  15. Carl Johan Lagerkvist,Kelvin Shikuku,Julius Okello,**Nancy Karanja** and Chris Ackello-Ogutu (2015). A conceptual Approach for measuring farmer’s attitude to integrated soil management in Kenya. Journal of Life Sciences (Wageningen) 74-75: 17-26
  16. Courtney M. Gallaher a , Antoinette M. G. A. WinklerPrins ,Mary Njenga and **Nancy K. Karanja** (2015) Creating space: Sack gardening as a livelihood strategy in the Kibera slums of Nairobi, Kenya . Journal of Agriculture, Food Systems, and Community Development. Advance online publication.  
<http://dx.doi.org/10.5304/jafscd.2015.052.006>
  17. I.K. Balume, O. Keya, **N.K. Karanja** and P.L. Woomer (2015) .Shelf-life of legume inoculants in different carrier materials available in East Africa. African Crop Science Journal, Vol. 23, No. 4, pp. 379 – 38 .DOI:
  18. G.N. Karuku, C.K.K. Gachene, **N. Karanja**, W. Cornelis, and H. Verplacke (2014).Effect of different cover crop residue management practices on soil moisture content under a tomato crop (*Lycopersicon esculentum*) . Tropical and Subtropical Agroecosystems, 17 (2014): 509 -52
  19. Solomon Kamau Mbau , **Nancy Karanja**, Frederick Ayuke. (2014) Influence of compost application on maize yield, soil macrofauna diversity and abundance in nutrient deficient soils of Kakamega County, Kenya. Plant and Soil 387:379-394. DOI:10.1007/s11104-014-2305-4
  20. S.P. Mutuma, J.J.Okello1, **N.K. Karanja** and P.L. Woomer (2014).Smallholder farmers’ use and profitability of legume inoculants in Western Kenya .African Crop Science Journal, Vol. 22, No. 3, pp. 205 – 213
  - 7.Maureen Nekoye Waswa, Nancy K. Karanja, Paul L. Woomer and George M. Mwenda (2014). Identifying elite rhizobia for soybean (*Glycine max*) in Kenya. African Journal of Crop Science 2(2):060-066.
  21. Maggie G. Munthali, Charles K. K. Gachene, Gudeta W. Sileshi, and **Nancy K. Karanja** (2014) Amendment of *Tephrosia* Improved Fallows with InorganicFertilizers Improves Soil Chemical Properties, N Uptake, and Maize Yield in Malawi. International Journal of Agronomy Volume 2014, Article ID 902820, 9 pages.<http://dx.doi.org/10.1155/2014/902820>.

22. Mary Njenga, Ph.D; **Nancy Karanja**; Hanna Karlsson; Ramni Jamnadass; Miyuki Iiyama; J Kithinji; Cecilia Sundberg (2014). Additional cooking fuel supply and reduced global warming potential from recycling charcoal dust into charcoal briquette in Kenya. Elsevier Manuscript # JCLEPRO-D-13-00516R2
23. G.N. Karuku , C.K.K.. Gachene, **N. Karanja**, and W. Cornelis (2014) Effect of different cover crop residues, management practices on soil moisture content under a tomato crop (*lycopersicon esculentum*). *Tropical and Subtropical Agroecosystems Journal* (in press).
24. Njenga. M., Yonemitsu, A., **Karanja, N.**, Iiyama, M., Kithinji, J., Dubbeling M., Sundberg, C and Jamnadass, R. (2013). Implications of charcoal briquette produced by local communities on livelihoods and environment in Nairobi, Kenya. *International Journal of Renewable Energy Development (IJRED)*. 2 (1) 19-29. Available online.
25. Njenga, M., **Karanja, N.**, Jamnadass, R., Kithinji, J., Sundberg, C., and Jirjis, R. (2013). Quality of briquettes produced locally from charcoal dust and sawdust in Kenya. *Journal of Biobased Materials and Bioenergy*. 7, 1-8.
26. Njenga, M., **Karanja, N.**, Munster, C., Iiyama, M., Neufeldt, H., Kithinji, J. and Jamnadass, R. (2013). Charcoal Production and Strategies to Enhance its Sustainability in Kenya. *Development in Practice*, 23 (3) 303-314
27. Courtney Maloof Gallaher, Dennis Mwaniki, Mary Njenga, **Nancy K. Karanja**, and Antoinette M. G. A. WinklerPrins (2013) Real or Perceived: The Environmental Health Risks of Urban Sack Gardening in Kibera Slums of Nairobi, Kenya. *EcoHealth* DOI: [10.1007/s10393-013-0827-5](https://doi.org/10.1007/s10393-013-0827-5).
28. Lelei, D.K., **Karanja, N.K.**, Ayuke, F.O, Kibunja, C.N, Vanlauwe, B. (2012). Effects of soil fertility management practices on soil aggregation, carbon and nitrogen dynamics (Accepted in *East African Agricultural and Forestry Journal*).
29. Ayuke F.O., **Karanja, N.K.**, Okello, J., Wachira, P., Mutua, G.K., Lelei, D., Gachene, C.K.K. (2012). Agrobiodiversity and potential use for enhancing soil health in tropical soils of Africa. In: Hester, R.E., Harrison, R.M. (Eds), *Soils and Food Security: Issues in Environmental Science and Technology*, No 35, 5: 94-133. The Royal Society of Chemistry, United Kingdom .
30. Erastus K. Kang'ethe & Violet N. Kimani & Brigid McDermott & Delia Grace & Alfred K. Lang'at & Monica W. Kiragu & **Nancy Karanja** & Alice N. Njehu & Thomas Randolph & Gabriel Mbugua & Tabitha W. Irungu & Peninnah Ombutu (2012) .A trans-disciplinary study on the health risks of cryptosporidiosis from dairy systems in Dagoretti, Nairobi, Kenya: study background and farming system characteristics. *Tropical Animal Health and Production* Accepted: 30 May 2012
31. **Nancy K. Karanja**, Mary Njenga, G. K Mutua, C. J. Lagerkvist, E. Kutto, and J. J. Okello. (2012) Concentrations of heavy metals and pesticide residues in leafy vegetables and implications for peri-urban farming in Nairobi, Kenya *Journal of Agriculture, Food Systems, and Community Development* Published online 12 October 2012
32. Carl Johan Lagerkvist, Sebastian Hess, Julius Okello & **Nancy Karanja** (2012). Consumer Willingness to Pay for Safer Vegetables in Urban Markets of a Developing Country: The Case of Kale in Nairobi, Kenya *The Journal of Development Studies* , published: 07 Dec 2012.

33. Carl Johan Lagerkvist, Sebastian Hess, Julius Okello, Helena Hansson, **Nancy Karanja** (2012). Food health risk perceptions among consumers, farmers, and traders of leafy vegetables in Nairobi .*Food Policy* 38 (2013) 92–104
34. Carl Johan Lagerkvist, Marther Ngigi, Julius J. Okello, **Nancy Karanja** (2012). Means-End Chain approach to understanding farmers' motivations for pesticide use in leafy vegetables: The case of kale in peri-urban Nairobi, Kenya. *Crop Protection* 39 (2012) 72e80
35. Carl Johan Lagerkvist, Julius Okello, **Nancy Karanja** (2012). Anchored vs. relative best–worst scaling and latent class vs. hierarchical Bayesian analysis best–worst choice data: Investigating the importance of food quality attributes in a developing country .*Food Quality and Preference* 25 (2012) 29–40
36. Delia Grace & Joseph Monda & **Nancy Karanja** & Thomas F. Randolph & Erastus K. Kang'ethe (2012). Participatory probabilistic assessment of the risk to human health associated with cryptosporidiosis from urban dairying in Dagoretti, Nairobi, Kenya *Tropical Animal Health and Production*, Accepted: 30 May 2012
37. Courtney M Gallaher, John M Kerr, Mary Njenga, **Nancy K Karanja**, Antoinette AMGA WinklerPrins (2012). Urban agriculture, social capital and food security in the Kibera slums of Nairobi, Kenya .Agriculture and Human Values. doi:[10.1007/s10460-013-9425-y](https://doi.org/10.1007/s10460-013-9425-y)
38. G.N. Karuku, C.K.K. Gachene, **N. Karanja**, W. Cornelis, H. Verplancke and G. Kironchi, Soil hydraulic properties of a nitisol in Kabete, Kenya *Tropical and Subtropical Agroecosystems*, 15 (2012): 595 – 609
39. E. K. Kutto, M. W. Ngigi, **N. Karanja**, E. Kange'the, L. C. Bebor, C. J. Lagerkvist, P. G. Muthia, L. W. Njagi And J. J. Okello(2011). Bacterial contamination of kale (*Brassica oleracea acephala*) along the supply chain in Nairobi and its environment. *East Africa Medical Journal Vol. 88 No. 2 February 2011*.
40. Julius J. Okello, Carl-Johan Lagerkvist, Sebastian Hess, Marther Ngigi and **Nancy Karanja** .Choice of Fresh Vegetable Retail Outlets by Developing-Country Urban Consumers: The Case of Kale Consumers in Nairobi, Kenya. *European Journal of Development Research* (2012) 24, 434–449.
41. Mary Njenga, Aya Yonemitsu, **Nancy Karanja** and Ramni Jamnadass (2011). Community-based fuel briquette production using charcoal dust and sawdust: implications on livelihoods for Nairobi residents *Miti. The Tree Business Magazine for Africa Issue No.12 October-December 2011*.
42. S. N. Mwangi, **N. K. Karanja**, H. Boga, J. H. P. Kahindi, A. Muigai, D. Odee and G. M. Mwenda.(2011) Genetic diversity and symbiotic efficiency of legume nodulating bacteria from different land use systems in Taita Taveta, Kenya *Tropical and Subtropical Agroecosystems*, 13 (2011): 109 – 118.  
Njenga, M., **Karanja, N.** and Magoiya, J. (2011) Risks Associated with Urban Wastewater Irrigation and Production of Traditional African Vegetable (TAVs) Seeds in Nairobi, Kenya. *ACTA Hort. (ISHS)* 911, 295-300.
43. E.M. Muya, **N. Karanja**, P.F. Z. Okoth, H. Roime, J. Munga'tu, B. Mutsotso and G.Thuranira(2009). Comparative Description of Land Use Aand Characteristics of Belowground Biodiversity Benchmark Sites in Kenya. *Tropical and Subtropical Agroecosystems*, 11 (2009): 263 – 275
44. F.O. Ayuke, , **N.K. Karanja**, E.M. Muya, B.K. Musombi, J. Mungatu and G.H.N. Nyamasyo (2009). Macrofauna Diversity and Abundance across different Land Use



- Systems in Embu, Kenya. *Tropical and Subtropical Agroecosystems*, 11 (2009): 371 – 384
45. J.W. Kimenju, **N.K. Karanja**, G.K. Mutua, B.M. Rimberia and P.M. Wachira (2009). Nematode Community Structure as influenced by Land use and Intensity of cultivation. *Tropical and Subtropical Agroecosystems*, 11 (2009): 353 – 360
  46. **N. K. Karanja**, F.O. Ayuke, E.M. Muya, B.K. Musombi and G.H.N. Nyamasyo Soil macrofauna community structure across land use systems of Taita, Kenya. *Tropical and Subtropical Agroecosystems*, 11 (2009): 385 – 396.
  47. J.M. Jefwa, S. Okoth, P. Wachira, **N. Karanja**, J. Kahindi, S. Njuguini, S. Ichamia, J. Mung'atu, P. Okoth, J. Huising. (2012) Impact of land use types and farming practices on occurrence of Arbuscular Mycorrhizal fungi (AMF) Taita-Taveta district in Kenya. *Agriculture, Ecosystems and Environment* 157 (2012) 32–39.
  48. G.K. Mutua, **N.K. Karanja**, F. Ayuke, H. Ndukhu & J.W. Kimenju. (2011). The potential of *Bacillus subtilis* and *Rhizobium leguminosarum* in controlling plant-parasitic nematodes in farmers' fields. African Crop Science Conference Proceedings, Vol. 10. pp. 207 – 213 © 2011.
  49. F.O. Ayuke, **N.K. Karanja** S.W. Bunyasi (2007) .Evaluating effect of mixtures of organic resources on nutrient release patterns and uptake by maize. *Advances in Integrated Soil Fertility Research in Sub-Saharan Africa: Challenges and Opportunities*, 833–844 © 2007 Springer
  50. **Nancy Karanja**, Gerald K Mutua, Fredrick Ayuke, Mary Njenga, Gordon Prain and John Kimenju (2010). Dynamics of soil nematodes and earthworms in urban vegetable irrigated with wastewater in the Nairobi river basin, Kenya. *Tropical and Subtropical Agroecosystems*, 12 (2010): 521 - 530
  51. J. Ambia, D Grace, EK Kang'ethe, SM Kamwati, **N Karanja**, V Kimani, M Kiragu, A Langat, J Monda, C Nyongesa, EK Mulinge, CK Mbae, G Mbugua, B McDermott, G Mitoko, J Monda, E Mulinge, M Njahira, A Njehu, J N Nyangaga, P Ombutu, W Ogara, TR Randolph, J Sinja, RA Skilton, D Waltner Toews (2012) Ecohealth and One Health approaches to emerging urban zoonoses: a case study in Nairobi, Kenya (eds. *Delia Grace and Erastus Kang'ethe* ILRI Working paper (September 2012).
  52. Njenga. M., Yonemitsu, A., **Karanja**, N., Iiyama, M., Kithinji, J., Dubbeling M., Sundberg, C and Jamnadass, R. (2013). Implications of charcoal briquette produced by local communities on livelihoods and environment in Nairobi, Kenya. *International Journal of Renewable Energy Development (IJRED)*. 2 (1) ISSN 2252-4940
  53. **Nancy K. Karanja**, Mary Njenga, G. K Mutua, C. J. Lagerkvist, E. Kutto, and J. J. Okello Concentrations of heavy metals and pesticide residues in leafy vegetables and implications for peri-urban farming in Nairobi, Kenya. *Journal of Agriculture, Food Systems, and Community Development* ISSN: 2152-0801 online ([www.AgDevJournal.com](http://www.AgDevJournal.com))
  54. George M Mwenda, **Nancy Karanja**, Hamadi Boga, James Kahindi, A. Muigai, D. Odee (2011) Abundance and diversity of legume nodulating rhizobia in soils of Embu district, Kenya. Special issue *Tropical and Subtropical Agroecosystems* vol. 13, No. 1 pp1-10 ( eds Nancy Karanja, Sheila Okoth, Jeroen Huising and Peter Okoth)
  55. **Nancy Karanja**, Sheila Okoth, Jeroen Huising and Peter Okoth (2011) Special Issue of *Tropical and Subtropical Journal* vol. 13, No. 1a

56. **Karanja, N.K.** Ayuke, F., Ndukhu, H., Kimenju, J.W and Mutua, G.K (2011) Evaluation of dual inoculation of *Bacillus subtilis* and *Rhizobium* on plant-parasitic nematodes and performance of common bean in farmers' fields. Accepted, Journal of
57. Mary Njenga, **Nancy Karanja**, Gordon Prain, Kuria Gathuru and Diana Lee-Smith (2011). Community-based wastewater farming and its contribution to livelihoods of the urban poor: Case of Nairobi, Kenya. Journal of Agriculture, Food Systems, and Community Development (JAFSCD) Vol 1, Issue 3.
58. **Karanja, N.K.** Kimenju, J.M., Esilaba, A.O., Jefwa, J., Ayuke F.O. (2011). Legume based cropping and soil biodiversity dynamics. In: Bationo, A., Waswa, B., Okeyo, J.M., Maina, F., Kihara, J., Mokwunye, U (Eds), *Fighting Poverty in Sub-Saharan Africa: The Multiple Roles of Legumes in Integrated Soil Fertility Management*, 4:67-83. Springer Science
59. G.K. Mutua, **N.K.Karanja**, F. Ayuke, , H. Ndukhu & J.W. Kimenju(2012).The potential of *Bacillus subtilis* and *Rhizobium leguminosarum* in controlling plant-parasitic nematodes in farmers' fields.African Crop Science Conference Proceedings, Vol. 10. pp. 207 – 213. ISSN 1023-070X/2011 \$ 4.00© 2011, African Crop Science Society.
60. J.M. Jefwa,, S. Okoth, P. Wachira, **N. Karanja**, J. Kahindi, S. Njuguni , S. Ichami, J. Mung'atu ,P. Okoth, J. , Huising (2012) Impact of land use types and farming practices on occurrence of arbuscular mycorrhizal fungi (AMF) Taita-Taveta district in Kenya(2012). Agriculture, Ecosystems and Environment 157 : 32–39
61. JR Okalebo,CO Othieno, SO Gudu, PL Woome, **NK Karanja**, C Serrem, HK Maritim,N Sanginga,A Bationo, RM Muasya, AO Esilaba, A Adesina, PO Kisinyo, AO Nekesa, MN Thuita and BS Waswa(. 2011).The African Green Revolution and the role of Partnerships.In Innovations as key to Green Revolution: Exploring the Scientific Facts .(eds. Bationo,A.,Waswa BS,JM Okeyo, FMaina and J Kihara) Volume1 pp71-81.Springer Science and Business Media BV.
62. **Nancy Karanja**,Sheila Okoth,Jeroen Huising and Peter Okoth (2011) Conservation and Sustainable Management of Belowground Biodiversity in Kenyan Agroecosystems. Special Issue of Tropical and Subtropical Agroecosystems Volume13 NO.1 2011.pp117
63. .Ngigi, M.W., J.J. Okello, C.L Lagerkvist, **N. K. Karanja**, J. Mburu (2011). Urban Consumers' Willingness to Pay for Quality of Leafy Vegetables along the Value Chain: The Case of Nairobi Kale Consumers, Kenya.International Journal of Business and Social Science Vol 2 No 6.
64. Simon M Mwangi, **Nancy N Karanja**, Hamadi M Boga, James M Kahindi, A. M Muigai, D. Odee, George M Mwenda (2011).Genetic diversity and symbiotic efficiency of legume nodulating bacteria from different land use systems in Taita Taveta, Kenya. Special issue Tropical and Subtropical Agroecosystems (eds. Nancy Karanja, Sheila Okoth, Jeroen Huising and Peter Okoth).Vol. 13, No. 1 pp 109-118
65. George M Mwenda, **Nancy Karanja**, Hamadi Boga, James Kahindi, A. Muigai, D. Odee (2011) Abundance and diversity of legume nodulating rhizobia in soils of Embu District, Kenya. Special issue Tropical and Subtropical Agroecosystems , ( eds Nancy Karanja, Sheila Okoth, Jeroen Huising and Peter Okoth) Vol. 13, No. 1 pp1-10
66. **Karanja, N.K.** Ayuke, F., Ndukhu, H., Kimenju, J.W and Mutua, G.K (2011) Evaluation of dual inoculation of *Bacillus subtilis* and *Rhizobium* on plant-parasitic nematodes and performance of common bean in farmers' fields.(Accepted, Journal of Biocontrol reviewers comments back)

67. Mary Njenga, **Nancy Karanja**, Gordon Prain, Kuria Gathuru and Diana Lee-Smith (2011). Community-based wastewater farming and its contribution to livelihoods of the urban poor: Case of Nairobi, Kenya. *Journal of Agriculture, Food Systems, and Community Development (JAFSCD)* Vol 1, Issue 3.
68. **Nancy Karanja**, Gerald K Mutua, Fredrick Ayuke, Mary Njenga, Gordon Prain and John Kimenju (2010). Dynamics of soil nematodes and earthworms in urban vegetable irrigated with wastewater in the Nairobi river basin, Kenya. *Tropical and Subtropical Agroecosystems*, 12 (2010): 521 – 530
69. Mary Njenga, **Nancy Karanja**, Cristel Munster, Miyuki Iiyama, Henry Neufeldt , Jacob Kithinji and Ramni Jamnadass (Published). Charcoal Production and Strategies to Enhance its Sustainability in Kenya . *International Journal for Agricultural Sustainability (IJAS)*.
70. Mary Njenga, **Nancy Karanja**, Gordon Prain, Diana Lee-Smith and Michael Pigeon (2011) Gender mainstreaming in organizational culture and agricultural research processes. *Development in Practice Journal*. Vol 21, Issue 3
71. Kutto, E.; Ngigi, M. **Karanja, N.**; Kange'the, E.; Bebora, L.C.; Carl Johan Lagerkvist, J.; Mbuthia, P.G.; Njagi, L. and Okello, J.J (forthcoming) Bacterial contamination of kale (*Brassica oleracea acephala*) along the supply chain in Nairobi and its environs. Kenya East African Medical Journal
72. **Karanja N.**, M. Njenga, G. Prain, E. Kangethe, G. Kironchi, C. Githuku, P. Kinyari and G.K. Mutua. (2010) Assessment of environmental and public health hazards in wastewater used for urban agriculture in Nairobi, Kenya" to *Tropical and Subtropical Agroecosystems*. *Tropical and Subtropical Agroecosystems* ,Vol 12, No 1 : 85-97 (January - April ) [www.veterinaria.uady.mx/ojs/index.php/TSA/index](http://www.veterinaria.uady.mx/ojs/index.php/TSA/index)
73. **Karanja, N.K.**, Ayuke, F.O., Muya, E.M., Musombi, B.K, Nyamasyo, G.H.N (2009) Soil macrofauna community structure across land use systems of Taita, Kenya . In a special issue of *Tropical and sub-tropical journal*, [www.veterinaria.uady.mx/ojs/index.php/TSA/index](http://www.veterinaria.uady.mx/ojs/index.php/TSA/index)
74. Kimenju, J. W., **Karanja, N.K.**, Mutua, G. K., Rimberia, B. M and Wachira P. M. (2009). Nematode community structure as influenced by land use and intensity of cultivation. In a special issue of *Tropical and sub-tropical journal*, [www.veterinaria.uady.mx/ojs/index.php/TSA/index](http://www.veterinaria.uady.mx/ojs/index.php/TSA/index)
75. Ayuke, F.O. **Karanja, N.K.** Muya, E.M., Musombi, B.K, Mungatu, J, Nyamasyo, G.H.N (2009) Macrofauna diversity and abundance across different land use systems in Embu, Kenya. *Tropical and sub-tropical journal*, [www.veterinaria.uady.mx/ojs/index.php/TSA/index](http://www.veterinaria.uady.mx/ojs/index.php/TSA/index)
76. **Nancy Karanja**, Gerald Mutua, Fredrick Ayuke, Mary Njenga, Gordon Prain and John Kimenju. Dynamics of soil nematodes and earthworms in urban vegetable irrigated with wastewater in the Nairobi River Basin, Kenya" to *Tropical and Subtropical agroecosystems* [www.veterinaria.uady.mx/ojs/index.php/TSA/index](http://www.veterinaria.uady.mx/ojs/index.php/TSA/index)
77. Rurunga Venant, **Karanja, Nancy K.** and Gachene ,Charles K.K.(2008) Six month-duration *Tephrosia vogelii* Hook.f. and *Tithonia diversifolia* (Hemsl.) A.Gray planted –falows for improving maize production in Kenya. *Biotechnol. Agron. Soc. Environ*, 2008 12(3), 267-278
78. Prain, G.; Arce, B.; **Karanja, N.** (2006). Horticulture in Urban eco-systems: some socioeconomic and environmental lessons from studies in three developing regions. *Acta Horticulturae*. International Society for Horticultural Science. <http://www.actahort.org>

79. FO Ayuke, **NK Karanja**, A.Awiti and M. Walsh 2006. Soil Macrofauna diversity and abundance across land use systems under different levels of disturbance and land use intensity in Kakamega District, Kenya. (Submitted to Journal of Applied Ecology, 2006)
80. E.M.Gichangi, **N.K. Karanja** and CW Wood 2006. Composting cattle manure from zero grazing systems with agro-organic waste to minimise nitrogen losses in smallholder farms in Kenya. *Tropical and Subtropical Agro ecosystems* 6 (2006), 57-64
81. Rurunga Venant, **Karanja, Nancy K.** and Gachene, Charles K.K. (2008) Six month-duration *Tephrosia vogelii* Hook.f. and *Tithonia diversifolia* (Hemsl.) A.Gray planted –falows for improving maize production in Kenya. *Biotechnol. Agron. Soc. Environ.*, 2008 12(3), 267-278
82. Prain, G.; Arce, B.; **Karanja, N.** (Forthcoming). Horticulture in Urban eco-systems: some socioeconomic and environmental lessons from studies in three developing regions. *Acta Horticulturae*. International Society for Horticultural Science. 2006. <http://www.actahort.org>
83. FO Ayuke, **NK Karanja**, A.Awiti and M. Walsh 2006. Soil Macrofauna diversity and abundance across land use systems under different levels of disturbance and land use intensity in Kakamega District, Kenya. (Submitted to Journal of Applied Ecology, 2006)
84. E.M.Gichangi, **NK Karanja** and CW Wood 2006. Composting cattle manure from zero grazing systems with agro-organic waste to minimise nitrogen losses in smallholder farms in Kenya. *Tropical and Subtropical Agro ecosystems* 6 (2006), 57-64
85. **N.K. Karanja**, F.O. Ayuke and M.J. Swift 2006. Organic resources quality and soil fauna: their role on microbial biomass, decomposition and nutrient release patterns in Kenyan soils. *Tropical and Sub-tropical ecosystems* 6 (2006), 73-86
86. F.O. Ayuke, M.R. Rao, M.L. Opondo-Mbai, M.J. Swift and **N.K. Karanja**. Diversity and abundance of soil invertebrate fauna in relation to quality of organic residues *Tropical and Sub-tropical ecosystems*, April 2006
87. Isaac Savini I, Paul C. Smithson, **Nancy K. Karanja** and Hideo Yamasaki. 2006. Influence of *Tithonia diversifolia* and triple super phosphate on dissolution and effectiveness of phosphate rocks in acid soils. *J.Plant Nutri.Soil Sci.*, 169, 593-604
88. Savini, P.C. Smithson and **N.K. Karanja** 2005. Effects of added biomass, soil pH and calcium on solubility of Minjingu phosphate rock in a Kenyan Oxisol. *Archives of Agronomy and Soil Science*, 00(0), 1-18
89. J.R.O., Kalebo, Othieno, C.O., **N.K. Karanja**, J.R.M Semoka and P.Woomer 2005. Appropriate available technologies to replenish soil fertility in East Africa. *Nutrient Cycling in Agroecosystems Journal*, Vol. 71 (in press).
90. **N.K. Karanja**, E. M. Gichangi and C. W. Wood. 2005. Simulation study to assess the potential of selected agro-organic wastes for ability to reduce N volatilization from cow manure. *Tropical and Subtropical Agroecosystems*, 5: 25-31
91. **N.K. Karanja**, K.A. Mwendwa, J.R. Okalebo, J.H.P Kahindi. 2004. Effect of phosphate rock fertilization and arbuscular mycorrhizae (am) inoculation on growth and nodulation of agro forestry tree seedlings. *West Africa Journal of Applied Ecology*, Vol. 6:55 – 64.
92. Kimenju, J.W., Muiru, D.M., **Karanja, N.K.**, Nyongesa, W.M. Miano, D.W. and Mutua, G.K. 2004. Assessing the role of organic soil amendments in management of

- root knot nematodes on common bean, *Phaseolus vulgaris* L. J. Trop. Microbiol. 2004, 3:14-23.
93. Kimenju, J.W., **Karanja, N.K.**, Nyongesa.W.M. 2004. Diversity and abundance of nematodes in agro ecosystems of Kenya. J. Trop. Microbiol. 2004, 3:24-33.
  94. Kahindi, J.H.P., **N.K. Karanja**, D. Odee and F.B. Mwaura. 2004. The diversity of biological nitrogen fixing systems in Kenya. J. Trop. Microbiol. 2004, 3:35-47
  95. **Karanja, N.K.**, C.K.K. Gachene, I. Savini and P.C. Smithson. 2004. The effect of *Tithonia diversifolia* (Hemsley) A. Gray biomass on the solubility of rock phosphates: A laboratory incubation experiment. Tropical and Subtropical Agro ecosystems.
  96. Bernard Muganda Meso, Wes Wood, **Nancy K. Karanja**, Paul L Woomer, S. M.Kinyali and Karen Veverica. 2004. Assessing the ability of two soil types in the removal and retention of N and P nutrients from fish pond effluents. Tropical and Subtropical Agroecosystems, 4:75-83.
  97. Bernard Muganda Meso, Wes Wood, **Nancy K. Karanja**, P.L. Woomer, S.M. Kinyali and Karen Veverica, 2003. Use of Pond Effluents of Different Nutrient Levels for Irrigation of Tomatoes and French Beans at the Sagana Fish Ponds, Kenya.. Communications in Soil Science and Plant Analysis Journal, 35 (7-8): 1021-1031.
  98. V. Rutunga, C.K.K. Gachene, **N.K. Karanja** and C.A. Palm, 2003 Grain Maize Yield Improvement using *Tephrosia vogelii* and *Tithonia diversifolia* Biomass at Maseno, Kenya. Tropical and Subtropical Agroecosystems, Vol. 2: 1-11
  99. Khisa, P., Gachene, C.K.K., **Karanja, N.K.** and Mureithi, J.G. 2002. The effect of post-harvest crop cover on soil erosion in a maize-legume based cropping system in Gatanga, Kenya. Journal of Agriculture in the Tropics and Subtropics, Vol 103, pp 17-28.
  100. Venant Rutunga, **Nancy K. Karanja** and Charles K.K. Gachene, 2001. Decomposition rates of biomass from six month-old *Tephrosia vogelii*, *Tithonia diversifolia* and natural fallow vegetation at Maseno, Kenya. Biological Agriculture and Horticulture. 19: 49-62.
  101. **Nancy Karanja**, J. Freire, M. Gueye and E. DaSilva, 2000. MIRCEN networking: capacity-building and BNF technology transfer in Africa and Latin America. AgBiotechNet (ABNO41) 2, 1-5.
  102. Evah W. Murage, **Nancy K. Karanja**, Paul C. Smithson and Paul L. Woomer, 2000. Diagnostic indicators of soil quality in productive and non-productive smallholders' field of Kenya's Central Highlands. Agriculture, Ecosystems and Environment 79, 1-8.
  103. P.L. Woomer, **N.K. Karanja** and J.R. Okalebo, 1999. Opportunities for improving integrated nutrient management by smallhol farmers in the Central Highlands of Kenya. African Crop Science Journal 7 (4), 441-454.
  104. J.W. Kimenju, **N.K. Karanja** and I. Macharia, 1999. Plant parasitic nematodes associated with common bean in Kenya and the effect of Meloidogyne infection on bean nodulation. African Crop Science Journal 7 (4), 489-497.
  105. Venant Rutunga, **Nancy K. Karanja**, Charles K.K. Gachene and Cheryl Palm, 1999. Biomass production and nutrient accumulation by *Tephrosia vogelii* (Hemsley) A. Gray and *Thithonia diversifolia* Hook F. fallows during the six-month growth period at Maseno, Western Kenya. Biotechnol. Agron. Soc. Environ. 3 (4), 237-246.
  106. Jane, J. Kapkiyai, **Nancy K. Karanja**, Javaid N. Qureshi, Paul C. Smithson and Paul L. Woomer, 1999. Soil organic matter and nutrient dynamics in a Kenyan

- nitisol under long-term fertilizer and organic input management. *Soil Biol. and Biochem.* 31, 1773-1782.
107. **Karanja, N.K.**, Mwendwa, K.A. and Zapata F. 1999. Growth and Phosphorus uptake of *Grevillea robusta* A. Cunn. for a phosphate fertilized acid soil. *Biotechnol. Agron. Soc. Environ.* 3 (1), 57-64.
  108. Woomer, P.L., Mateete A. Bekunda, **Nancy K. Karanja**, Thomas Moorehouse and Robert Okalebo, 1998. Agricultural Resource Management by smallholder farmers in East Africa. *Nature and Resources, UNESCO Journal on the Environmental and Natural Resources Research* 34 (4), 22-33.
  109. Woomer P.L., J.H.P. Kahindi and **N.K. Karanja**, 1998. Nitrogen replenishment in the East African Highlands through Biological Nitrogen Fixation and Legume Inoculation. *Agronomie Africaine (Special Issue) No. 1*, 387-413.
  110. Venant Rutunga, Kurt G. Steiner, **Nancy K. Karanja**, Charles K.K. Gachene and Gre'goire Nzabonihankuye, 1998. Continuous fertilization on non-humiferous acid Oxisols in Rwanda "Plateau Central": Soil chemical changes and plant production. *Biotechnol. Agron. Soc. Environ.* 2(2), 135-145.
  111. Kapkiyai J.J., **Karanja, N.K.**, Woomer P.L. and Qureshi, J.N. 1998. Soil organic carbon fractions in a long-term experiment and the potential for their use as a diagnostic assay in Highland Farming Systems of Central Kenya Highlands. *African Crop Science Journal* 6 (1), 19-28.
  112. Mwendwa, K.A., **N.K. Karanja**, F. Zapata and S.W. Maingi 1997/1998. Evaluation of phosphorus uptake from Minjingu Phosphate Rock and Growth of six Agroforestry species on Acid soils from Western Kenya. *Int. J. of Biochem Physics*, Vol. 6&7 (1&2), 79-85.
  113. Risper Amolo and **Nancy Karanja**, 1996 Nitrogen mineralization from cattle manure, filtermud, factory ash and nitrogen uptake by maize (*Zea mays*) in a glasshouse experiment. *East Afric. Agric. And For. J.* 62 (1) in press.
  114. David Kamweti, Ratema Michieka and **Nancy Karanja**, 1996. Tree Species Composition and Spacing in Agroforestry Systems of Embu District, Kenya. *E. Afric. Agric. and For. J.* 63:1 (in press).
  115. Kahindi, J.H.P., Woomer, P.L., T. George, F.M. de Souza, Moreira, **N.K. Karanja** and K.E. Giller, 1995. Agricultural Intensification, Soil Biodiversity and Ecosystem Function: The Role of Nitrogen Fixing Bacteria. *Applied Soil Ecology*, 6 (1), 55-76.
  116. Marufu, L., **Karanja, N.K.** and Ryder, M. 1995. Legume inoculant Production and Use in Eastern and Southern Africa. *Soil Biol. Biochem.*, 27 (4/5), 735-738.
  117. **Karanja, N.K.** and Wood, M. 1988b. Selecting *Rhizobium phaseoli* strains for use with beans (*Phaseolus vulgaris* L.) in Kenya. II. Screening for tolerance of high temperature and antibiotic resistance. *Plant and Soil*, 112, 15-22.
  118. **Karanja, N.K.** and Wood, M. 1988a. Selecting *Rhizobium phaseoli* strains for use with beans (*Phaseolus vulgaris* L.) in Kenya. I. Ineffectiveness and tolerance of acidity and aluminium. *Plant and soil*, 112, 7-13.
  119. **Karanja, N.K.** and Wood, M. 1985. Selecting suitable reference crop for estimating N- fixation by beans (*Phaseolus vulgaris* L.) using <sup>15</sup>N Isotope Dilution Technique. *Agric. and For. J.* 56 (4).
  120. Ssali, H. and **Mureria, N.K.** 1982. Interaction between soil pH, *Rhizobium phaseoli* strains and bean variety. *E. Afric. Agric. and For. J.* 45 (1).
  121. Arshad, M.A., **Mureria, N.K.**, Keya, S.O. 1982. Effect of termite activity on soil microflora. *Pedobiologia* 24, 161-167.

## Book Chapters

1. Ayuke F.O., **Karanja, N.K.**, Okello, J., Wachira, P., Mutua, G.K., Lelei, D., Gachene, C.K.K. (2012). Agrobiodiversity and potential use for enhancing soil health in tropical soils of Africa. In: Hester, R.E., Harrison, R.M. (Eds), *Soils and Food Security: Issues in Environmental Science and Technology*, No 35, 5: 94-133. The Royal Society of Chemistry, United Kingdom
2. Karanja, N.K, Kimenju, J.M., Esilaba, A.O., Jefwa, J., **Ayuke F.O.** (2011). Legume based cropping and soil biodiversity dynamics. In: Bationo, A., Waswa, B., Okeyo, J.M., Maina, F., Kihara, J., Mokwunye, U (Eds), *Fighting Poverty in Sub-Saharan Africa: The Multiple Roles of Legumes in Integrated Soil Fertility Management*, 4:67-83. Springer Science.
3. **Nancy Karanja** and Mary Njenga (2011) Feeding the Cities. In Worldwatch Institute, State of the World 2011: Innovations that Nourish the Planet. ISBN 9781849713528. <http://www.worldwatch.org/sow11>
4. Gordon Prain, **Nancy Karanja** and Diana Lee-Smith (eds). (2010) African Urban Harvest: Agriculture in and around African Cities, 2002-2006. IDRC CIP/Urban Harvest. Springer publishers (In press expected mid- 2010)
5. Mary Njenga, Dannie Romney, **Nancy Karanja**, Kuria Gathuru, Stephen K. Kimani, Sammy Carsan and Will Frost (2010) Recycling Nutrients from Organic Wastes in Kenya's Capital City
6. **Nancy Karanja**, Mary Njenga, Kuria Gathuru, Anthony Karanja and Patrick Munyao (2010). Crop-Livestock-Waste Interactions in Nakuru, Kenya. In Gordon Prain, Nancy Karanja and Diana Lee-Smith (eds). African Urban Harvest: Agriculture in and around African Cities, 2002-2006. RC CIP
7. Erastus Kang'ethe, Alice Njeru, **Nancy Karanja**, Mary Njenga, Kuria Gathuru and Anthony Karanja (2010). Benefits and Selected Health Risks of Livestock Rearing in Nakuru Municipality, Kenya. . In Gordon Prain, Nancy Karanja and Diana Lee-Smith (eds). African Urban Harvest: Agriculture in and around African Cities, 2002-2006. IDRC CIP/Urban Harvest
8. Mary Njenga, **Nancy Karanja**, Kuria Gathuru, Samwel Mbugua, Bernard Ngoda, Naomi Fedha and Natasha Andersen (2009) The role of women-led micro-farming activities in combating HIV/AIDS in Nakuru, Kenya. In Alice Horvoka, Henk De Zeeuw and Mary Njenga (eds) Women Feeding Cities. Mainstreaming gender in urban agriculture and food security. [www.ruaf.org](http://www.ruaf.org)
9. Kuria Gathuru, Mary Njenga, **Nancy Karanja** and Patrick Munyao 2009. Gender Perspectives in Organic Waste Recycling in Urban and Peri-Urban Agriculture in Nairobi, Kenya. In Alice Hovorka, Henk De Zeeuw and Mary Njenga (eds). Women Feeding Cities. Mainstreaming Gender in Urban Agriculture and Food Security. Practical Action Publishing, Rugby, UK. pp 141-155 [www.developmentworkshop.com](http://www.developmentworkshop.com)
10. Okalebo J.R., Othieno C.O., Woomer P.L., **Karanja N.K.**, Semoka J.R.M., Bekunda M.A., Mugendi D.N., Muasya R.M., Bationo A. and Mukhwana E.J. 2007. Available technologies to replenish soil fertility in East Africa. pp45-62. In: Advances in Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities (Eds. Bationo, A., Waswa, B., Kihara J. and Kimetu J.) . Springer NL
11. **N. K. Karanja**, Mutua G.K., Kimenju J.W. 2007 Evaluating the effect of dual-inoculant of *Bradyrhizobium leguminosarum* and *Bacillus* spp. on nodulation and nematode damage on beans (*Phaseolus vulgaris* L.) .pp865-871. In: Advances in

- Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities. (eds.Bationo, A., Waswa, B., Kihara J. and Kimetu J.) . Springer NL.
12. Njenga M., Kimani S., Romney D. and **Karanja N** 2007. Nutrient Recovery from Solid Waste and Linkage to Urban and Peri- Urban Agriculture in Nairobi, Kenya.pp 487-491.In:Advances in Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities (Eds.Bationo, A., Waswa, B., Kihara J. and Kimetu J.) Springer NL .
  13. J.R.Okalebo,Othieno,C.O,Ruto,E.J.,Mwaura,F.M.,**Karanja,N.K.**,Obura,P.A.,Gudu,S. Njoroge,R.K.and Bation,A.2006.Integrating marginal lands into productive agricultural systems by means of improving fertilizer use efficiency .In Proceedings of the 3<sup>rd</sup> International symposium on Phosphorus Dynamics in Sulphur-Plant Continuum. Uberlandia, Minas Gerais, Brazil 14-19 May 2006.
  14. **N.K.Karanja**,Mutua G.K.,Kimenju J.W.2006 Evaluating the effect of dual-inoculant of *Bradyrhizobium leguminosarum* and *Bacillus* spp. on nodulation and nematode damage on beans (*Phaseolus vulgaris* L.) . In : Advances in Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities (eds.Bationo, A., Waswa, B., Kihara J. and Kimetu J.) (in press by Springer NL).
  15. Gichangi E.M., **Karanja N.K.** and Wood C.W. 2006 *Managing* manure heaps with agro-organic wastes and cover to reduce nitrogen losses during storages in the Central Kenyan Highlands. In : Advances in Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities (eds.Bationo, A., Waswa, B., Kihara J. and Kimetu J.) (in press by Springer NL).
  16. Ayuke F.O., **Karanja N.K.** and Bunyasi S.W. 2006 Evaluating effect of mixtures of organic to resources on nutrient release patterns and uptake by maize. In :Advances in Integrated Soil Fertility Management in sub Saharan Africa: Challenges and Opportunities (eds. Bationo, A., Waswa, B., Kihara J. and Kimetu J.) (in press by Springer NL).
  17. **Nancy Karanja**, Mary Njenga, Kuria Gathuru and Anthony Karanja(Forthcoming). Urban Agriculture and Livestock keeping in Nakuru: A Scoping Study on Crop-Livestock-Waste Interactions. In Urban Agriculture in Sub-Sahara Africa-20 years on: Case studies and perspectives . Gordon Prain, Nancy Karanja and Dian Lee-Smith Ed. (2006). pp250
  18. Erastus Kangethe, Alice Njeru, **Nancy Karanja**, Mary Njenga, Kuria Gathuru and Anthony Karanja(Forthcoming). Assessment of Benefits and Selected Health Risks Associated with Livestock rearing in Nakuru, Kenya. In Urban Agriculture in Sub-Sahara Africa-20 years on. Gordon Prain, Nancy Karanja and Dian Lee-Smith Ed. (2006). pp250
  19. Mumbi Kimathi., Michael Mbaka, **Nancy Karanja**, Mary Njenga and Mary Kamore. (Forthcoming)Viable Market Opportunities and threats for Urban and Peri- urban Farmers: A case of Nairobi, Kenya. In Urban Agriculture in Sub-Sahara Africa-20 years on. Gordon Prain, Nancy Karanja and Dian Lee-Smith Eds. (2006). pp250
  20. Mary Njenga, Stephen Kimani' Dannie Romney ,**Nancy Karanja**(Forthcoming).Nutrient Recovery from Solid Waste and Linkage to Urban and Peri- Urban Agriculture in Nairobi, Kenya In Urban Agriculture in Sub-Sahara Africa-20 years on. Gordon Prain, Nancy Karanja and Dian Lee-Smith Eds. (2006). pp250
  21. **Karanja,N.K.**, Kimenju, J.M., Esilaba,A.O., Jefwa,J.and Ayuke,A. 2005 Fighting Poverty in Sub-Saharan Africa: The Multiple Roles of Legumes in Integrated Soil Fertility Management. Chapter 4: Legumes, soil biodiversity and soil-borne pests



- and disease dynamic. ( in review process)
22. **Nancy K.Karanja**, John W.Kimenju, Isaac Macharia and David M. Muiru 2003. Plant -parasitic nematodes associated with common bean (*Phaseolus vulgaris* L.) and integrated management Approaches. In “ Biological Management of Soil Ecosystems for Sustainable Agriculture “. World Soil Resources Reports 101. (<http://www.fao.org/DOCREP/006/Y4810E/y4810e00.htm>)
  23. Kahindi, J.H.P. and **Karanja, N.K.** 2002. Biological Nitrogen Fixation Technology, in Biotechnology (Eds. E. DaSilva and H.W. Doelle) pp 21. ENCYCLOPEDIA OF LIFE SUPPORT SYSTEMS. EOLSS Publishers Co. Ltd. Oxford, UK, 2002 (also on [www.oels.net](http://www.oels.net)).
  24. J.H.P. Kahindi and **Nancy K.N. Karanja** 2006. Essentials of nitrogen fixation biotechnology. UPDATED VERSION. In ENCYCLOPEDIA OF LIFE SUPPORT SYSTEMS. EOLSS Publishers Co. Ltd. Oxford, UK, (also on [www.oels.net](http://www.oels.net))
  25. **Karanja, N.K.** and Kahindi, J.H.P. 2002. Agricultural Biotechnology, in Biotechnology (Eds. E. DaSilva and H.W. Doelle) pp12. ENCYCLOPEDIA OF LIFE SUPPORT SYSTEMS. EOLSS Publishers Co. Ltd. Oxford, UK, 2002 (also on [www.oels.net](http://www.oels.net)).
  26. P.L. Woomer, **N.K. Karanja** and E.W. Murage, 2001. Estimating total system carbon in smallhold farming systems in East African Highlands. In (R. Lal, J.M. Kimble, R.F. Follet and B.A. Stewart, Eds). Assessment methods for soil carbon - Advances in Soil Science (series) terris Publishers, Bocan, Raton, USA. pp 147-166.
  27. **Karanja, N.K.**, Woomer, P.L. and Wangaruro, S. 1995. Indigenous rhizobia populations in East and Southern Africa: A network approach. In: Microbial Diversity and Ecosystem Function. (eds. D. Allsopp, D.L. Harksworth and R.R. Colwell) pp. 447 - 453. CABI. ISBN: 0 85198 898 9.
  28. Gathuru, K., **Nancy Karanja** and Mary Njenga (2007) Wastewater irrigation empowers Kenya's urban farmers. New Agriculturalist . <http://www.new-agri.co.uk/07/02/focuson/focuson6.php>
  29. Mwangi S., Mumbi K., Kamore M., Karanja N. & Njenga M. 2007. Creating Market Opportunities for Poor Women Farmers in Kenya. *Urban Agriculture Magazine*. Vol 17. Leusden, The Netherlands: ETC-Urban Agriculture.
  30. Njenga, M., K. Gathuru and N. Karanja 2004. Analysis of Gender Roles in Resource Recovery for Urban Agriculture in Nairobi, Kenya in *Women Feeding Cities Proceedings of the Gender Mainstreaming in Urban Food Production and Food Security Workshop*, ed. G. Prain, H. De Zeeuw. Jointly organized by ETC-RUAF and CGIAR-Urban Harvest in collaboration with IWMI-Ghana. <http://www.cipotato.org/urbanharvest/documents/pdf/women-feeding-cities.pdf>
  31. Njenga M. and Nancy Karanja 2006. Community-Based Compost Production for Urban Agriculture in Nairobi in O. Cofie and A. Bradford Chapter 8. *Organic Waste Reuse for Urban Agriculture in Cities Farming in the Future*, ed. René van Veenhuizen. Leusden, The Netherlands: ETC-Urban Agriculture. [http://www.idrc.ca/en/ev-103817-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-103817-201-1-DO_TOPIC.html) also available in print form. p238-242.

## Books/Proceedings

1. **Nancy Karanja**, Sheila Okoth, Jeroen Huising and Peter Okoth (2011) Conservation

- and Sustainable Management Of Belowground Biodiversity in Kenyan Agroecosystems. Special Issue of Tropical and Subtropical Journal vol. 13, No. 1
2. **Nancy Karanja**, Sheila Okoth, Jeroen Huising and Peter Okoth (2010). Belowground Biodiversity in Kenyan Soils. Special issue of Tropical and Subtropical Journal volume 11 No.2
  3. Gordon Prain, **Nancy Karanja** and Dian Lee-Smith. Urban Agriculture in Sub-Saharan Africa-20 years on. (2010). Publisher Springer. pp250
  4. **Nancy K. Karanja**, Harrison O. Kwach and Mary Njenga. 2004. Low cost composting manual for the smallholder farmers and community- based composting groups. (publication in process).
  5. **Nancy Karanja**, M.Njenga, Pay Drechsel and Andy Bradford 2004. Solid Waste management and urban agriculture. **In** : Feeding cities in Anglophone Africa with Urban Agriculture. Concepts, tool and case studies for practitioners, planners and policy makers. CD-ROM
  6. **Karanja, N.K.** Ayuke, F., Ndukhu, H., Kimenju, J.W and Mutua, G.K (2011) Evaluation of dual inoculation of *Bacillus subtilis* and *Rhizobium* on plant-parasitic nematodes and performance of common bean in farmers' fields. (Accepted, Journal of Biocontrol reviewers comments back)

#### Articles in Newsletters and Magazines

1. Njenga M., **Karanja, N.**, Iiyama, M., Kithinji, J., and Jamnadass, R. (2012). Charcoal for improved tree cover. Yes, producing the fuel sustainably saves trees and alleviates energy poverty. Miti. The Tree Business Magazine for Africa. No.16 October-December 2012, 29-31.  
<http://www.betterglobeforestry.com/index.php/miti-digital-magazines.html>
2. Njenga, M., **Karanja, N.**, Kithinji, J., Iiyama, M., and Jamnadass, R. (2012). From dust to energy: Effects of briquettes on indoor air quality and the environment". Miti. The Tree Business Magazine for Africa. No.14 April-June 2012, 22-24.  
<http://www.betterglobeforestry.com/index.php/miti-digital-magazines.html>
3. Njenga M, Jamnadass, R., **Karanja, N.**, Kithinji, K. and Iiyama. M. (2012). Let us Make Fuel Briquettes. The Materials Community Groups Use and the Heating Quality of the Product. Miti. The Tree Business Magazine for Africa. Issue No.13 January-March 2012, 26-27.  
<http://www.betterglobeforestry.com/index.php/miti-digital-magazines.html>
4. Njenga, M., Yonemitsu, A. **Karanja, N.** and Jamnadass, R. (2011) Making a Living from Dust. Urban Dwellers Find an Alternative Fuel in Briquettes Made from Charcoal Waste and Sawdust. Miti. The Tree Business Magazine for Africa. Issue No.12 October-December 2011, 22-24.
5. Mary Njenga, **Nancy Karanja** and Janet Magoiya (August, 2009) Urban Farmers Earn Income from Seed Production in Nairobi, Kenya. Urban Grown the Newsletter for the Kansas City Centre for Urban Agriculture. [www.kccua.org/urbangrown.htm](http://www.kccua.org/urbangrown.htm)
6. Samwel Mbugua, Nancy Karanja and **Mary Njenga** (October, 2008) Gardens of Hope for Victims of HIV/AIDS in Nakuru, Kenya. Urban farms produce income, health, joy for some of the world's poorest families. Urban Grown, the Newsletter for the Kansas City Centre for Urban Agriculture. [www.kccua.org/urbangrown.htm](http://www.kccua.org/urbangrown.htm)
7. Mary Njenga, **Nancy Karanja**, Samwel Mbugua, Natasha Andersen and Jeniffer Levy (2008). Contribution of women living with HIV/AIDS to urban livelihoods, food and nutritional security in Nakuru, Kenya. **In** special issue of G&D News in December

2008 highlighting Centers' work in the field of HIV/AIDS.

[www.genderdiversity.cgiar.org](http://www.genderdiversity.cgiar.org)

8. Gathuru, K., **Nancy Karanja** and Mary Njenga (2007) Wastewater irrigation empowers Kenya's urban farmers. *New Agriculturalist*. <http://www.new-agri.co.uk/07/02/focuson/focuson6.php>
9. Mwangi S., Mumbi K., Kamore M., **Karanja N.** & Njenga M. 2007. Creating Market Opportunities for Poor Women Farmers in Kenya. *Urban Agriculture Magazine*. Vol 17. Leusden, The Netherlands: ETC-Urban Agriculture.
10. Mary Njenga and **Nancy Karanja** (2005) Turning Urban Waste into Resource for Agriculture NEFSALF Bulletin No. 2 Mazingira Institute. <http://www.mazinst.org/>
11. **Nancy Karanja** and Mary Njenga (August, 2007) International Urban Agriculture Spotlight: Nairobi, Kenya. Urban Grown the Newsletter for the Kansas City Centre for Urban Agriculture. [www.kccua.org/urbangrown.htm](http://www.kccua.org/urbangrown.htm)]

### Referred Proceedings

1. Fredrick O. Ayuke, Nancy K. Karanja, Alex Awiti. Soil Macofauna diversity and abundance in Natural and Agricultural Ecosystems in Kakamega, Kenya.
2. **Karanja, N.K.**, K.A. Mwendwa, J. R. Okalebo and F. Zapata. 2003. Effects of phosphate rock fertilization and arbuscular mycorrhizae inoculation on growth of agroforestry tree seedlings. In: S.S. Rajan and H.S. Chien (eds.). Direct application of phosphate rock and related technology: latest developments and practical experiences. Proc. Int. Meeting, Kuala Lumpur, 16-20 July, 2001, Special Publication IFDC-SP-37. Muscle Shoals, Alabama, USA, p. 353-366.
3. J. R. Okalebo, **N.K. Karanja**, H.K. Maritim, PL. Woomer, P.A. Obura, P. Nekesa and F. Mwaura. 2003. Nutrient replenishment in small holder farms of western Kenya using the "Prep-pac" product. In: S.S. Rajan and H.S. Chien (eds.). Direct application of phosphate rock and related technology: latest developments and practical experiences. Proc. Int. Meeting, Kuala Lumpur, 16-20 July, 2001, Special Publication IFDC-SP-37. Muscle Shoals, Alabama, USA, p. 367-377.
4. **Karanja, N.K.**, K.A. Mwendwa, and F. Zapata. 2002. Response of seedling of *Grevillea robusta* A cunn to phosphorus fertilization in acid soils from Kenya. In: *Assessment of soil phosphorus status and management of phosphatic fertilizers to optimise crop production*. IAEA-TECDOC-1272. pp. 201-223.
5. **N.K. Karanja** and K.A. Mwendwa, 2002. Evaluation of phosphorus uptake from Minjingu Phosphate rock, growth and nodulation of agroforestry tree species in an acid soil from Kenya. In: *Assessment of soil phosphorus status and management of phosphatic fertilizers to optimise crop production*. IAEA-TECDOC-1272. pp. 183-200.
6. J.A. Ang'awa., **N. Karanja**, D. Odee and R. Buresh. Estimation of the effect of nitrate nitrogen on nodulation, dry matter yield and N<sub>2</sub> fixed by *calliandra calothyrsus*. 2002. In: Proceedings of the 9<sup>th</sup> AABNF Conference on Challenges and Imperatives for Biological Nitrogen Fixation: Research and Applications in Africa for the 21<sup>st</sup> Century, 2002 (eds. Nancy K. Karanja and James H.P. Kahindi) pp. 11-20. John Philips Africa Ltd. Publishers, Nairobi, Kenya, ISBN No. 9966-879-41-2
7. K.A. Mwendwa, W. Eason, **N.Karanja**, V. Rutunga, J. Roberts, F. Zapata and D.O. Nyamai. 2002. Estimation of N<sub>2</sub>- fixation in phosphorus- fertilised *Leucaena leucocphala* and *G. sepium* seedlings using *S. siamea* and *E.grandis* as reference tree. In: Proceedings of the 9<sup>th</sup> AABNF Conference on Challenges and Imperatives for Biological Nitrogen Fixation: Research and Applications in Africa for the 21<sup>st</sup> Century,

- 2002 (eds. Nancy K. Karanja and James H.P. Kahindi) pp. 94-104. John Philips Africa Ltd. Publishers, Nairobi, Kenya, ISBN No. 9966-879-41-2 .)
8. **N. Karanja**, S. Wangaruro and B.M. Anyango, 2002. Performance of indigenous Bradyrhizobia strains isolated from Kenyan soils. In: Proceedings of the 9<sup>th</sup> AABNF Conference on Challenges and Imperatives for Biological Nitrogen Fixation: Research and Applications in Africa for the 21<sup>st</sup> Century, 2002 (eds. Nancy K. Karanja and James H.P. Kahindi) pp. 198-204. John Philips Africa Ltd. Publishers, Nairobi, Kenya, ISBN No. 9966-879-41-2).
  9. Gachene, C.K.K., **Karanja, N.K.**, Mureithi, J.G., 2000. Effect of soil erosion on soil productivity using green manure cover crops: data summary of a long-term field trial. LRNP Newsletter Issue No. 4, NARL-KARI pp 11-13.
  10. Khisa, P.W., Gachene C.K.K., **Karanja, N.** and Mureithi, J.G. 2000. Returning land back to productivity: the role of green cover crops in controlling soil erosion in farmers' fields in Gatanga. A poster presented at the 11<sup>th</sup> international Soil Science Conference, Bueno, Aires, Argentina.
  11. S. Wangaruro, **N.K. Karanja**, E.T. Makatiani, D.W. Odee and P.L. Woomer, 1998. Chemical properties, initial microbial populations and survival of rhizobia in peat, vermiculite and filtermud. (eds. S.M. Mpeperekki and F.I. Makonese). pp 160-164. In Harnessing Biological Nitrogen Fixation in African Agriculture (challenges and opportunities). Proceedings of the sixth International Conference of the African Association for Biological Nitrogen Fixation (AABNF), 12-17 September, 1994, Harare, Zimbabwe ISBN 0-908307-58-6.
  12. S.K. Kimani, B.A. Osborne, C.J. Pilbeam, M. Wood and **N.K. Karanja**, 1998. Agricultural production in semi-arid regions: Use of legume-based mixed cropping systems in Kenya. (eds. S.M. Mpeperekki and F.I. Makonese) pp. 207-209. In Harvessing Biological Nitrogen Fixation in African Agriculture (challenges and opportunities). Proceedings of the sixth International Conference of the African Association for Biological Nitrogen Fixation (AABNF) 12-17 September, 1994, Harare, Zimbabwe.
  13. **Karanja, Nancy K.** and P.L. Woomer, 1998. Legume Response to Rhizobia Inoculation and farmer awareness of Inoculants in East and Southern Africa. (eds. J.A. Brink and B.A. Prior) pp. 76-91. UNESCO/BAC BETCEN: African Agricultural Research Council Pretoria, 23-24 March, 1998. ISBN: 1-86849-086-6.
  14. Woomer, P.L., **N.K. Karanja**, E.I. Mekki, B. Mwakalombe, H. Tembo, M. Nyika, M. Silver, C. Nkwiine, P.N. Ndakindemi and G. Msumali, 1997. Indigenous populations of rhizobia, legume response to inoculation and farmer awareness of inoculants in East and Southern Africa. (eds. E. Adipala, J.S. Tenywa and M.W. Ogenga-Latigo). First African Crop Science Conference Proceedings. 3, 297-308. ISBN: 1023-070x.
  15. **Karanja, N.K.**, A.K. Mwala, P.L. Woomer and R.W. Haru, 1997. Response of *Glycine max* and *Phaseolus vulgaris* to Rhizobia inoculation, Nitrogen and Phosphorus Fertilization in Kenya. (eds E. Adipala, J.S. Tenywa and M.W. Ogenga-Latigo). First Crop Science Conference Proceedings 3, 323-330. ISBN: 1023-70x.
  16. Okalebo, J.R., **Karanja, N.K.**, Woomer, P.L., Gathua, K.W. 1994. What options do resource poor farmers have to conserve the fertility of their land? Trans. 15th World Congress of Soil Science, Acapulco, Mexico 10-16 July 1994, Vol 9, 525-526.
  17. **Karanja, N.K.** and Woomer, P.L., 1994. Response to beans (*Phaseolus vulgaris* L.) to selected *Rhizobium phaseoli* strains on acid soils in Kenya. In: Biotechnology for Rapid Development. Proceeding of the Africa Regional Symposia in biotechnology for

- Rapid Development. (ed. Amadou Tidiane B9) pp. 224-228. Nairobi, Kenya 17-21 February, 1992. African Biosciences Network (ABN), 1994. ISBN: 92-9091-012-7.
18. **Karanja, N.K.**, Woomer, P.L., Wangaruro, S. 1992. Indigenous Rhizobial population at two sites in Kenya. In Recent Development in Biological Nitrogen Fixation Research in Africa. (eds. M. Sadiki and A. Hilali) pp.170-175. Proceedings of 5th International Conference of the African Association for Biological Nitrogen Fixation (AABNF) held at the Hassan II Institute of Agronomy and Veterinary Medicine (IAV) Rabat, Morocco, 14-19 Sept. 1992. ISBN: 9981-9842-0-5.

### Proceeding papers

1. **N.K. Mureria**, S.O. Keya and M.A. Arshad, 1980. Effects of termite activity on soil microflora. A paper presented at the 4th AGM of Soil Science Society of East Africa in Arusha, Tanzania held on 27th-28th October, 1980.
2. **Karanja, N.K.** and Odee, D.,1989. The use of biotechnology in enhancement of Nitrogen fixation in plants . A paper presented at the workshop on Plant biotechnology held on 24 to 26 May, 1989 Nairobi, Kenya.
3. **Karanja, N.K.** and Kibunja, C.N., 1989. Research work on Biology Nitrogen Fixation of atmospheric nitrogen. A paper presented at the 1st Annual Kenya Agricultural Research Institute Conference 14-16 August 1989, Nairobi, Kenya.
4. Okalebo, J.R., **Karanja, N.K.**, Gathua, K.W., Lekasi, J.K. and Woomer, P.L.,1993. The use of manure and fertilizer in sustained maize production in drylands of Kenya. presented at the 1st Crop Science Conference of Eastern and Southern Africa, 14- 18 June 1993, Kampala, Uganda.
5. Mwendwa, A.K. and **Karanja, N.K.**,1994. Evaluation of availability and uptake of P from Rock phosphate (RP) with mycorrhizal inoculation by agroforestry tree species growing on two acid soils in Kenya. Paper presented at the 2nd Crop Science Society meeting in Lilongwe, Malawi.
6. **Karanja, N.K.**,1995. Contribution of biological nitrogen fixation towards food production in Africa and environmental challenges. Paper presented at the TSBF/Rockefeller Foundation Conference on " Soils Management in Eastern and Southern Africa " held in Bellagio Centre, Milan, Italy on 29th Jan. - 5th Feb. 1995.
7. **Karanja, N.K.** and Mwendwa, A.K. 1995. Estimation of availability and uptake of P from Minjingu Rock phosphate (MRP) by six (6) tree species growing on an acid soil using the  $^{32}\text{P}$  isotope dilution technique . Paper presented at the 2nd Research Co-ordination meeting of the FAO/IAEA co-ordinated Research Programme, held at CIRAD, Montpellier, France 24 - 29 April 1995.
8. Angawa, J.A., **Karanja, N.K.** and Odee, D. 1998. Estimation of the effects of  $\text{NO}_3\text{-N}$  on nodulation, dry matter yield and  $\text{N}_2$  fixed by *Calliandra calothyrsus*. (ed. F.D. Dakora) pp 6-7. Poster presented at the 8th Congress of the African Association for Biological Nitrogen Fixation (AABNF), 23-27 November, 1998.
9. **N.K. Karanja**, A.K. Mwala, J.P. Kahindi and P.L. Woomer, 1998. The East African Rhizobium MIRCEN: A review of the Progress in research, training and information dissemination. (ed. F.D. Dakora) pp 101-102. Poster presented at the 8th Congress of the African Association for Biological Nitrogen Fixation (AABNF), 23-27 November, 1998.
10. Mwala, A.K. and **N.K. Karanja**, 1998. Effects of rock phosphate fertilizer, Rhizobium inoculation and VA-mycorrhizae on nodulation and growth of soyabeans (*Glycine max L.*) grown on Humic Nitosol. (ed. F.D. Dakora) pp 160-161. Poster

- presented at the 8th Congress of the African Association for Biological Nitrogen Fixation (AABNF), 23-27 November, 1998.
11. Mwendwa, A.K., Eason W., **N.K. Karanja**, V. Rutunga, Roberts, J., Zapata F. and Nyamai, D.O. 1998. Estimation of N<sub>2</sub>-Fixation in phosphorus fertilized *Leucaena leucocephala* and *Gliricidia sepium* seedlings using *Senna siamea* and *Eucalyptus grandis* as reference trees. (ed. F.D. Dakora) pp. 164-165. Poster presented at the 8th Congress of the African Association for Biological Nitrogen Fixation (AABNF), 23-27 November, 1998.
  12. Mwendwa, K.A., Eason, W., **Karanja, N.K.**, Zapata, J., Rutunga, V. and Roberts, J. 1999. Effect of phosphorus on growth of four agroforestry tree seedlings and N<sub>2</sub>-fixation of *Leucaena leucocephala* and *Gliricidia sepium*. In proceedings of the 17<sup>th</sup> conference of Soil Science Society of East Africa (eds J.S. Tenywa, J.Y.K Zake, P.Ebanyat, O. Semalulu and S.T. Nkalubo) pp. 85-84
  13. M.B. Meso, P.L. Woomer, **N.K. Karanja**, C.W. Wood and K.L. Veverica, 1999. Application of fish pond effluent to French beans through drip irrigation at Sagana, Kenya. In proceedings of the 17<sup>th</sup> conference of Soil Science Society of East Africa (eds J.S. Tenywa, J.Y.K Zake, P.Ebanyat, O. Semalulu and S.T. Nkalubo) pp 189-193.
  14. Khisa, P.W., Gachene, C.K.K., **Karanja, N.K.** and Mureithi, J.G, 2000. Soil and nutrient losses due to erosion in a maize-legume based cropping system in Central Kenya. Extended abstract in proceedings of the 4<sup>th</sup> regional Meeting of the Forum for Agricultural Resource Husbandry (RF) 10-14<sup>th</sup> July 2000, Lilongwe, Malawi (pp. 79-81).
  15. Kimenju, J.W. and **Karanja, N.K.**, 2000. Nematodes associated with beans and the response of bean germplasm to *Meloidogyne ineognita*. Extended abstract in proceedings of the 4<sup>th</sup> regional Meeting of the Forum for Agricultural Resource Husbandry (RF) 10-14<sup>th</sup> July 2000, Lilongwe, Malawi (pp. 85-87).
  16. Macharia, I, Kimenju, J.W., **Karanja, N.K.** and Mutitu, E.W, 2000. Effect of *Bacillus spp.* on root knot nematode population and galling in beans. Extended abstract in proceedings of the 4<sup>th</sup> regional Meeting of the Forum for Agricultural Resource Husbandry (RF) 10-14<sup>th</sup> July 2000, Lilongwe, Malawi (pp. 108-109).
  17. Sande, S.O., Ogol, K.P, Woomer, P. and **Karanja, N.K.**, 2000. The influence of soil fertility management practices on population sizes of soil fauna in Central highlands of Kenya. Extended abstract in proceedings of the 4<sup>th</sup> regional Meeting of the Forum for Agricultural Resource Husbandry (RF) 10-14<sup>th</sup> July 2000, Lilongwe, Malawi (pp. 227-228).
  18. **Nancy K. Karanja** and Paul. L. Woomer, 2000. Legume inoculation and overcoming constraints to inoculant use: Activities of the Rhizobium Ecology Network of East and Southern Africa (Abstract): In Proceedings of the 12<sup>th</sup> International Congress on Nitrogen Fixation, FozdoIguacu, Parana, Brazil, September 12-17, 2000. Nitrogen Fixation: From molecules to crop productivity (eds. F.P. Pedrosa, M. Hungria, M.G. Yates and W.E. Newton), pp. 547, Kluwer Academic Publishers.
  19. J.R. Okalebo, **N.K. Karanja**, H.K. Maritim, P.L. Woomer, P.A. Obura, P. Nekesa and F. Mwaura, 2002. Nutrient replenishment in smallhold farms of western Kenya using the "Prep-Pac" product. Paper presented at the IFDC International Workshop on "Direct Application of Phosphate rock and Related Technology". Kuala Lumpur, Malaysia, July 16-20, 2001.
  20. **N.K. Mureria**, 1980. Activities of Nairobi MIRCEN. A paper presented at CAIRO - MIRCEN training course held at Ain-Shams University of Nairobi on 8-22 September, 1980.

### **Technical/Contract Reports**

1. Woomeer, P.L. and **Karanja, N.K.** Technical Report on The Rhizobium Ecology Network of East and Southern Africa (RENEASA) Phase II Activities: Legume Inoculation Response and Farmer Perceptions of Nitrogen Fixation and Legume Inoculants. Rockefeller Foundation (Contract RF 97005#169), 1996.
2. **Nancy Karanja** and Paul Woomeer. Technical Report on Agricultural Resource Management in Smallholder Systems in the Central Kenya Highlands. FORUM (Grant RF 94-031#35), 1997.
3. **Nancy Karanja.** Technical Report on Rhizobium Inoculant Production and Quality Control. Dutch Special Biotechnology, The Hague, (Contract ZWOO4802), June, 1997.
4. Abdalla, M.A. and **N.K. Karanja.** Technical Report on Rhizobia Isolation Inoculant Production and Quality Control. UNESCO-MIRCEN (Contract SC/RP 206.686), May, 1997.
5. **Nancy Karanja,** Paul Woomeer and James Angawa. Technical Report on Critical Needs Assessment to Determine the Infrastructural and Human Resource Requirements of ISAR for the implementation of a BNF Development Programme in Rwanda and Nodulation, biomass production and N<sub>2</sub> fixed by *Calliandra calothyrsus*. UNESCO-MIRCEN, (Contract 810.256.6), December, 1997.
6. Paul L. Woomeer, J. Robert Okalebo and **Nancy K. Karanja.** The PREP-PAC Approach to nutrient Replenishment. Poster presented at the 4th Fertilizer Round Table Meeting, 26th February, 1998.
7. Hansingo, L.P. and **Nancy Karanja.** Technical Report on Rhizobium Technology. UNESCO-MIRCEN (Contract SC/PR 206.756.7), March, 1998
8. **Nancy Karanja.** Biofix Fertilizer Great for Beans. The Farmer No. 001 March/April, 1998. pp 12-13.
9. Maria Claire Dasylyva and **Nancy Karanja.** Technical Report on Methods in Legume Inoculant Production and Quality Control. UNESCO-MIRCEN (Contract 810.179.8), August, 1998.
10. **Nancy Karanja,** Sebastian Wangaruro, Migdam E. Abdelgani and Somaya Mohamed. Technical Report on Inoculant Production at the Biological Nitrogen Fixation Department (BNFD), at the Environment and Natural Research Institute (ENRRI), Khartoum, Sudan. UNESCO (Contract SC/BSC/LS/95 BAC. Prof.), December, 1998.
11. Frank Banda and **Nancy Karanja.** Production of Rhizobia Inoculants: Characterisation of Filtermud and Peat carrier Materials and Rhizobia Survival. January, 2000.
12. Foum Ali Garu and **Nancy Karanja.** Assessing by <sup>15</sup>N technique the performance of three strains of bradyrhizobia on two legume crops. February, 2001.
13. Eugenia S. Kweka and **Nancy Karanja.** Methods of Legume Inoculant Production and Quality Control. March, 2003.

### **Professional Contributions (Editor, Projects and Awards Evaluations)**

1. East African Agricultural Forestry Journal.
2. Journal of Agriculture Science and Technology (JAST) - JKUAT.
3. African Crop Science Journal (ACSJ)
4. ANAFE Programme ICRAF.

5. East African Forestry and Agricultural Journal (EAFJ).
6. UNESCO – Travel Award Fellowships, American Society of Microbiology (ASM).
7. UNESCO Carlos Finlay Prize.
8. Journal of Discovery and Innovations.
9. International Foundation of Science (IFS) Grants awards.
10. National Environment Management Authority (NEMA)
  - i). State of Environment (SOE)
  - ii). Draft report regulation, guidelines and standards

### **External Examiner**

1. Bunda College, Malawi (1995-1996).
2. Moi University, Eldoret (1995-2003).
3. Makerere University, Uganda (1996-2003).
4. Egerton University, Njoro (1996-1998).
5. Sokoine University, Tanzania (1998-1999).
6. University of Zimbabwe (2002-2003)

### **Consultancies**

- 1995:** Preparing proposals for strengthening non-point pollution assessment capabilities and for research (Task 16). Lake Victoria Environmental Management Programme. pp56.
- 1996:** Inventory and rehabilitation of soil conservation measures in the Nyayo Tea Zones, Nyayo Tea zones Development Corporation (KAMFOR Co.) pp93.
- 1996:** Soil sampling and conservation manual for Nyayo Tea Zone Development Cooperation. pp39.
- 1998:** Evaluation of the Forum for Agricultural Research (FORUM) Programmes supported by the Rockefeller Foundation. pp60.
- 2002:** SIDA-SAREC Evaluation Mission on ICRAF's Zambia Agroforestry Project, 2002 Report. pp50.
- 2002:** Preparation of the final project documentation on Conservation and sustainable Management of Belowground Biodiversity (BGBD) Global Project (GEF-2715-02) pp 36.
- 2002:** Organization of the 1<sup>st</sup> Global Start-up workshop held in Wageningen, Netherlands, jointly with Tropical Soil Biology and Fertility and CIAT Institute Workshop. pp128.
- 2003-5:** American Society of Microbiology. Grant reviewer
- 2004-6:** Reviewer for the IDRC: AGROPLIS publications
- 2005:** IWMI: Status of waste water use for urban agriculture in East Africa

### **Partnerships**

I have established partnerships between the University of Nairobi and the following institutions:

1. International Potato Centre (CIP)
2. International Livestock research Centre (ILRI)
3. Tropical Soil Biology and Fertility of CIAT
4. International Water Institute (IWMI)
5. World Agro forestry Centre (ICRAF)
6. International Institute for Tropical Agriculture (IITA)
7. Urban Harvest (SWEP) of CIP
8. Global Mountain Programme (SWEP) of CIP
9. International Food Policy Research Institute (IFPRI)



10. UN bodies (HABITAT, UNEP, UNESCO, IAEA, FAO)
11. American Society for Microbiology
12. Regional ( Malawi, Zimbabwe ,Uganda, Tanzania Ethiopia, Ghana , Cote de Voire) and International (England, Canada, Brazil , Indonesia,,India ,USA, Netherlands, Belgium, Norway ) Universities
13. International NGOs eg Family Health International (FHI), Development Agency Inc, USA, CARE Canada, World Vision
14. Regional and National NGOs and CBOs particularly in urban centres
15. A number of government ministries and Departments in the region including the local ones