

Dr. Fredrick Ouma Ayuke



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Personal details (bio-data)

Date of birth: 1969
Nationality: Kenyan
Marital status: Married
Languages: English, Kiswahili (Proficient in written and spoken), Luo (Native)
Home address: P.O Box 185, Rongo

WORK EXPERIENCE AND ACOMPLISHMENTS

Feb 2011- To date

Department of Land Resource Management and Agriculture Technology (LARMAT), University of Nairobi

Nairobi, Kenya

Senior Lecturer (Dec 2013 to date), Lecturer (Feb 2011-Dec 2013)

Teaching Soil Biodiversity and Agro-ecology; Recycling and bioconversion of organic wastes, Research Methods, Data management & Communication of Science.

Supervises both Undergraduates and Postgraduates: currently supervising three MSc and four PhD students in Biodiversity Conservation and Ecosystem services, Climate change and Food security aspects.

Leads research in collaboration with Kenya Agricultural and Livestock Research Organization (KALRO), The Aga Khan University, East African Institute, USA; International Centre for Tropical Agriculture (CIAT) and World Agroforestry Centre (ICRAF). These researches being part of capacity building for PhD studentship.

Results:

Has produced four MSc and one PhD theses through student supervision.

Led the process of publication of five articles in peer reviewed journal,

and three articles in book chapters.

Project Review Consultant for Finnish Embassy in Kenya (**April-October, 2016**).

Quality review on the report of study for the Embassy of Finland in Kenya on *Assessment of needs and capacities for private sector engagement in the forestry sector-Kenya*.

Nov 2011- Dec 2013

World Agroforestry Centre (ICRAF), and International Centre for Tropical Agriculture (CIAT)/Food and Agriculture Organization (FAO)

Nairobi, Kenya

Consultant and project manager

Monitoring long-term activities in Sub-Saharan Africa for the development of guidelines for Soil Health Management.

Networking and coordinating team members from collaborating institutions across East (Kenya), South (Malawi, Zimbabwe) and West Africa (Ghana, Burkina Faso and Niger).

Formulating project work plans and budgets on behalf of the partner institutions (ICRAF and CIAT).

Managed a project budget for the project supported by FAO at a cost of US \$ 60, 000.

Collecting data of national partners in African Research Network (AFNET) on the effect of soil health management practices in maize-based, sorghum, and millet-based cropping systems in three different ecological zones of sub-Saharan Africa-across long-term trial in East (Kenya), South (Malawi and Zimbabwe) and West Africa (Ghana, Burkina Faso and Niger).

Documenting and publishing case studies of appropriate and sustainable management techniques that successfully address the declining soil health status of the dominant cropping systems in the major agro-ecological zones in sub-Saharan Africa.

Preparing quarterly and annual reports for partner institutions (ICRAF and CIAT) on behalf of FAO. Data synthesis on going.

Nov 2010-Dec 2011

Colorado state University/World Agroforestry Centre (ICRAF)/ International Centre for Tropical Agriculture (CIAT)

The United states/Nairobi, Kenya

Consultant

Conducted field activities on behalf of Colorado State University (CSU), based at the **African Soil Information System (AFSIS)** sentinel sites of **Kisongo, Kiberashi, Pandambili and Chinyanghuku** in Tanzania.

Managed a budget of US \$ 10,000 in the project.

Networked with various institutions and organization in Kenya and Tanzania for the implementation of project activities.

Developed project work plans aimed at surveying unexplored soil Biodiversity in Sub-Saharan Africa to enhance agricultural productivity.

Collected the required field data on soil biodiversity, and sent collected soil samples to CSU for analysis, and preparation of a final project report.

Nov 2008-Jan 2012

Department of Land Resource Management and Agriculture Technology (LARMAT), University of Nairobi

Nairobi, Kenya

Lecturer and Project Coordinator, Biodiversity Conservation

Taught Soil Biodiversity and Agroecology; Recycling and bioconversion of organic wastes.

Supervised Undergraduates and postgraduate students.

Conducted research (2008-2012): As a Principal investigator on Lake Victoria Research Initiative (VicRes): Investigated impact of biocontrol (*Bacillus subtilis*) for the control of nematodes on bean production (2006-2009) and evaluated effect of organic biomass on compost quality and its impact on soil fauna diversity and maize yield (2008-2011).

Designed Project Log frames, Monitoring and Evaluation Frameworks, Annual Work Plans and Budgets.

Managed a budget of US \$ 150, 000 provided by SIDA through VicRes research initiative.

Organized Project sensitization workshop for the farmers, and other stakeholders on biodiversity conservation issues in western Kenya.

Coordinated and supervised research both technical and field staff involved in the project.

Trained more than 500 farmers on best-practices for the production of high quality and suitable composts from various organic sources.

Worked with the farmers in their fields to test biocontrol products for the control of nematodes, and the agronomic effectiveness of the composts produced.

Collected and analyzed data on soil chemical properties and monitored nematodes following application of biocontrols as well as the different composts in Western Kenya.

Produced 2 MSc theses through student supervision.

Published 2 articles in peer reviewed journal.

Compiled 3 detailed annual project reports to the development partners.

Jan 2006-Jan 2010

Wageningen University/CIAT

Research/Doctoral Fellow

Conducted work on the biodiversity of soil macrofauna functional groups and their effects on soil structure in East and West African cropping systems, as related to organic resource management, crop rotation and tillage, for a PhD thesis of Wageningen University (2006-2010).

Managed a project budget of over US \$ 200,000 funded by Global Science for Development of the Netherlands, International Atomic Energy Agency (IAEA) and *Norman Borlaug* fellowship.

As a project implementer, I networked with scientists and the technical staff of the different institutions and organizations across East, West and South Africa, Europe and America to facilitate project execution.

Developed work plans, budget plan, Monitoring and Evaluation systems for the project on behalf of the funding agencies.

Collected field research and analyzed data in long-term trials in Kenya, Malawi, Nigeria, Ghana, Burkina Faso and Niger.

Supervised the field activities of MSc students both from the Wageningen University and from the University of Nairobi.

Produced four annual project reports during the project life.

Produced four MSc. theses through student supervision.

Produced a PhD thesis in soil biodiversity and functions in cropping systems of Sub-Saharan Africa.

Led the process of publication of two articles in peer reviewed journal.

Sept 2003-Jan 2006

Department of Applied Biology, Kenya Methodist University

Assistant Lecturer

Taught Soil Microbiology, Environmental Sciences (Introduction to Environmental Science, Applied Ecology, Rangeland Resources, Agroforestry, Ecotourism Development & Management),

Conservation Biology and Biodiversity studies and Botanical Sciences (Plant Systematics, Plant Structure & Anatomy, Plant Ecology and Evolutionary Biology).

Supervised and mentored undergraduate students.

Spearheaded the establishment of Departmental botanical garden For teaching and research.

Ensured students got timely release of departmental examination results

Conducted research (2004-2006): As a Principal investigator on Lake Victoria Research (VicRes) Initiative, I investigated impact of land use intensification on soil quality (Chemical, physical and biological properties).

The Netherlands; Nairobi, Kenya

Meru, Kenya

Between 2003 and 2004, as principal investigator, I assessed the effect of soil fertility management (SFM) practices on soil biodiversity in established trials in Kakamega District, Kenya under Tropical Soil Biology and Fertility (TSBF) Institute of CIAT initiative.

Managed a budget of US\$ 150,000 from SIDA through VicRes Initiative, and a further US\$ 10,000 from Tropical Soil Biology and Fertility (TSBF) Institute of CIAT.

Developed work plan for the execution of the project research.

Collected data in collaboration with world Agroforestry Centre, University of Nairobi, and Agricultural Research Institute (ARI), Mlingano-Tanga, Tanzania.

Analyzed the collected data and produced three annual reports.

Produced one article in refereed journal and one article in a proceeding.

May 2000-Sept 2003

Tropical Soil Biology and Fertility Institute of CIA T (TSBF-CIAT)

Nairobi, Kenya

Research Assistant/Assistant researcher

1. Participated in United Nations Environmental Programme (UNEP) Global Environmental Facility (GEF) project on the Conservation and Management of Below-ground Biodiversity (CSM-BGBD), based at Embu and Taita Hills, Kenya. This initiative funded at a cost of US \$ 5 million coordinated by TSBF-CIAT and it involved 7 global countries: Kenya, Uganda, Indonesia, Mexico, Brazil, India and Cote d'Ivoire (**Jan 2003- Jan 2010**).

Developed concept for a study on the UNEP/GEF Project on the impact of land use changes and or practices on belowground biodiversity (Soil Macrofauna dynamics).

Conducted research through collection of required site data, data analysis and prepared reports on results.

Led the process of publishing two articles in peer reviewed journals.

2. Planned and carried out Global Litter Invertebrate Experiment (GLIDE) at a designated site of Kakamega Forest, western Kenya. This was a project of International Biodiversity Observation Year (IBOY) and this involved over 23 countries globally (**Feb 2002- Mar 2003**).

Managed the project budget estimated at US \$ 60,000.

Liaised (networked) with GLIDE organizers and other partners as required.

Prepared work plans for the execution of the research project.

Collected the required site data; Conducted laboratory and data analyses.

Developed one technical report from the research results.

Participated in the publication of one article in refereed journal.

3. **May 2000-Feb 2002:** Supported in the coordination of project field activities.

Worked with other TSBF staff and field assistants to organize and manage network experiments.

Reviewed University Student (MSc/M.Phil) proposal and developed work plan to fit within the African Research Network (AfNet) and TSBF framework of activities.

Coordinated supervision of the students' field activities.

Conducted baseline studies and network experiments based on the project proposals approved to be within TSBF/AfNet framework

Produced one Master of Philosophy (M.Phil) theses on soil ecology through student supervision.

July 1995- Sept 1999

International Centre for Research in Agroforestry (ICRAF) and Tropical Soil Biology and Fertility Programme (TSBF)

Nairobi, Kenya

Research fellow

Conducted research in ICRAF/TSBF-CIAT collaborated project in Western Kenya through ICRAF-African Education (ANAFE) and Programme Research Fellowships estimated at a cost of US\$ 55,000.

Conducted an M.Phil research study on the Diversity, abundance and function of soil invertebrates in relation to quality of organic residues

Coordinated field activities and collected the required field and laboratory data.
 Conducted analysis of the collected field and laboratory data.
 Produced thesis in Soil biology a research that led to award in MPhil of Moi University.
 Led the process in the publication of 2 articles in a refereed journal and three book chapters.

EDUCATIONAL BACKGROUND

Sept 2015- Aug 2015:	Department of Soil Ecology, Swedish University of Agricultural Sciences (SLU) <i>Post Doc Researcher</i> Research: <i>Soil fauna interactions and role in the biocontrol of soil borne pathogens and diseases.</i>	Uppsala, Sweden
Jan 2006- Jan 2010:	Department of Soil Quality, Wageningen University (WUR) <i>Degree of Doctor in Soil Biology (2010)</i> Thesis title: <i>Soil macrofauna functional groups and their effects on soil structure, as related to agricultural management practices across agroecological zones of Sub-Saharan Africa.</i>	Wageningen, The Netherlands
Oct 1996-Sept 1999	Department of Forestry, Moi University, Kenya <i>Master of Philosophy (M. Phil) degree (2000) in Soil Biology (Ecology).</i> Thesis title: <i>Diversity, abundance and function of soil invertebrates in relation to quality of organic residues.</i>	Eldoret, Kenya
Oct 1990-Nov 1993	Department of Forestry, Moi University, Kenya <i>Bachelor of Science (BSc). Honors in Forestry (1994); Second Class (Honours) Upper Division</i>	Eldoret, Kenya

AWARDS

Sept 2014-Aug 2015: Awarded (US \$ 25,000) **Swedish Institute (SI) Postdoc Fellowship** at the Swedish University of Agricultural Sciences (SLU), Uppsala Sweden.

Nov 2007-Dec 2008: Awarded (US \$ 20,000) **NORMAN E. BORLAUG** International Agricultural Science and Technology Leadership Enhancement in Agriculture Program (LEAP) Fellowship as co-funds for PhD studies.

Jan 2006-Jan 2010: Awarded **NWO/WOTRO Project Doctoral Fellowship** (US \$ 200,000) to pursue studies at Wageningen University (WUR) under Netherlands World tropical Research Organization (WOTRO/NWO) of Netherlands.

Feb 2005: Awarded **seed money** (US \$ 10,000) by TSBF-CIAT to co-finance research activities and conduct a study on effect of Soil Fertility Management Practices on Soil Biodiversity.

Aug 2004-2010: Awarded research funds (US \$ 150,000) by **Swedish International Development Agency (SIDA)** under Lake Victoria Research (VicRes) initiative to investigate impact of land use intensification on soil (chemical, physical and biological) quality within Lake Victoria Basin. This project involved both Kenya and Tanzania.

July 1997-Sept 1999: Awarded (US \$ 50,000) **Programme Research Fellowship** by World Agroforestry Centre (ICRAF).

May 1997-Sept 1999: Awarded (US \$ 5,000) **ANAFE Postgraduate fellowship** by World Agroforestry Centre (ICRAF).

Oct 1996-Sept 1999: Awarded (US 10,000) **Partial Scholarship** to pursue M.Phil studies by Moi University.

EXTRA MURAL ACTIVITIES AND RESPONSIBILITIES

2009-2016: Chair Board of Management, Okota Mixed Secondary School, Homa Bay.

2006-2009: Member of Board of Management, Okota Mixed Secondary School, Homa Bay.

PROFESSIONAL SKILLS AND COMPETENCIES

Communication: At University and throughout my employment, I have developed excellent communication skills enabling me to deal with people effectively at all levels (management, fellow students and young people) e.g. verbal and written communication through my degree and teamwork via employment.

Leadership: My extra-mural achievement (responsibilities) and skills at the University, School and working places has enable me to show leadership ensuring objectives are met by the target groups e.g. outward bound exercises.

Analytical and problem solving skills: As a Scientist I have developed these to high levels. Much of my research/project has involved collecting and analyzing results and reaching logical conclusions.

Organizational: Time management and organizational skills have been developed through my combined part time work and University study and throughout my employment period. I have demonstrated both reliability and ability to meet targets.

Other skills:

COMPUTER LITERATE: I have demonstrated experience on the use of statistical packages (GENSTAT, SAS and SPSS), computer spreadsheets (MS word, MS Access, MS Excel and MS PowerPoint). This is backed by a course taken on computer science at the University.

Driver: I possess a clean driving license in B, C and E class of vehicles with over 18 years experience.

SPECIALIZED LABORATORY TRAINING & REFRESHER COURSES & WORKING VISITS

Dec 2014: Attended course in Taxonomy of Soil fauna, Swedish University of Agricultural Sciences, Sweden.

May-June 2014: Attended training on methods of sampling soil fauna, Dakar, Senegal.

Dec 2009: Attended a course in Techniques for writing & Presenting Scientific papers, Wageningen University, The Netherlands.

Mar-April 2006/09: Attended Soil micromorphology analysis at the World Soil Information Centre (ISRIC), The Netherlands.

Nov-Dec 2008: Attended Soil fractionation, aggregate wet sieving and isotope labeling; UC-Davis, USA

Feb 2007: Attended a course in Soil Ecology at Wageningen University, The Netherlands.

March-April 2006: Attended refresher training in Earthworm taxonomy and ecology at the Hungarian Natural History Museum, Budapest, Hungary.

April-May 2006: Attended a course in Presentation skills at Wageningen University.

Mar-April 2006: Attended a course in Project and Time management, Wageningen University.

Aug 2006: Attended a course on Introduction to biodiversity-R statistical program under BGBD/TSBF-CIAT initiative, Nairobi, Kenya.

April 2006: Attended training on Multivariate analysis under PE&RC Graduate School initiative, Wageningen University.

Feb 2006: Attended information literacy course, Wageningen University.

Feb 2005: Trained in Ant/termite taxonomy and ecology under TSBF-GEF/UNEP (CSM-BGBD) project, Nairobi, Kenya.

Nov 2004: Trained in Earthworm taxonomy and ecology under TSBF-GEF/UNEP (CSM-BGBD) project, Nairobi, Kenya.

April 2004: Trained in award winning project proposal writing under ICRAF/IFS initiative, Nairobi, Kenya.

Feb-May 1998: Trained in taxonomy and ecology of soil invertebrates at the National Museums of Kenya, Nairobi.

SUPERVISION OF POST GRADUATE STUDENTS

#	Name of Student	Thesis Title	MSc/PhD,	Year enrolled	Year graduated	Status of project (Graduated, Ongoing)
1	David K. Lelei	Effect of trees on spatial variability of soil macrofauna across land use systems, Kiberashi, Tanzania	PhD	2011	2015	Graduated (University of Nairobi-UoN)
2	Solomon Mbau Kamau	Spatial effects of dominant tree species on soil macrofauna across agricultural catchments representing a soil fertility gradient.	PhD	2013		Ongoing
3	Moses Kaiira	Allelopathic properties of bioactive compounds in rice and medicinal plants, and effects on plant growth and yield	PhD	2014		Ongoing
4	Elizabeth Okwuosa	Soil Carbon and Fluxes of Carbon Dioxide, Nitrous Oxide and Methane from Crop-Livestock Systems In Kenya	PhD	2014		Ongoing
5	Marius Murongo	Developing strategies for increasing adoption and endurance of tissue culture banana orchard, Mbarara, Uganda	PhD	2015		Ongoing

6	Fred Kisa Wamalwa (JKUAT)	Impact of Livelihood Choices on Environmental Degradation in Kieni Sub Counties, Kenya.	PhD	2016		Jointly supervised with JKUAT, currently at proposal stage.
7	Kizito Musundi Kwena	Contribution of Pigeon pea to nitrogen and phosphorus in maize cropping systems in Kenya	PhD	2008		Ongoing. Student was discontinued, appealed the decision, and was newly assigned to me after supervision plan was changed.
8	Nyakeoga Kwamboka Violet	Evaluating the agronomic effectiveness of human faecal compost on maize yields, its influence on soil chemical properties and soil fauna abundance	MSc	2012	2015	Graduated (UoN)
9	Sara Söderlund	Exploring biological control of <i>Fusarium</i> wilt on tomatoes-use of <i>Bacillus subtilis</i> and interactions with the earthworm <i>Pontoscolex corethrurus</i> in Kenyan highlands	MSc	2013	2015	Graduated at the Swedish University of Agricultural Sciences (SLU)
10	Margarida Simbiine	Effect of varying soybean planting density on maize (<i>Zea mays</i>) and soybean (<i>Glycine max</i>) yields in a maize-soybean intercrop system in western Kenya	MSc	2011	2013	Graduated, UoN
11	Solomon Kamau Mbau	Evaluating quality of composts made from organic agro-wastes and their influence on maize yield and soil fauna in western Kenya	MSc	2010	2012	Graduated, UoN
12	Johnson	Effects of tillage practices on water use efficiency and performance of common beans in Katumani	MSc	2015		Ongoing
13	Fadhil Olela	Effect of tillage, cropping system and organic inputs on nutrients dynamics and yield of maize and dolichose.	MSc	2015		Ongoing
14	Harrison Churi	Diversity of Scarabidae beetles across different land use types and their role in soil fertility improvement in Kenya	Msc	2015		Ongoing

OTHER KEY RESPONSIBILITIES

Reviewer for Agriculture Ecosystem and Environment (Elsevier) Journal (2012-2013); Plant and Soil Journal (2012-2013); Applied Soil Ecology (2014-2015).

External proposal reviewer for Alliance for Green Revolution in Africa “AGRA” (2013)
 Member of Scientific Advisory Committee for Global Soil Biodiversity Initiative (GSBI) (2012 to date).
 Lead Author, Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), 2015 to date.

RESEARCH PUBLICATIONS

Peer reviewed articles=19; Book Chapter=7, Conference proceedings=7; Theses=2

Peer reviewed articles

Ayuke, F.O., Lagerlöf, J., Jorge, G., Söderlund, S., Muturi, J.J., Sarosh, B.J., Meijer, J. (2017). Effects of biocontrol bacteria and earthworms on *Alternaria brassicae* disease severity and growth of oilseed rape plants (*Brassica napus*). **Under revision with Applied Soil Ecology Journal.**

Paul, B.K., Pulleman, M.M, **Ayuke, F.O.**, Six, J., Vanlauwe, B (2016). Response to G.W Sileshi letter to the editor on AGEE13857 (2015): Exclusion of soil macrofauna did not affect soil quality. Statistical artefact or true lack of effect. **Agriculture, Ecosystems and Environment**, 221:282-284.

Lagerlöf, J., **Ayuke, F.**, Bejai, S., Jorge, G., Lagerqvist, E., Meijer, J., Muturi John, J., Söderlund, S (2015). Potential side effects of biocontrol and plant-growth promoting *Bacillus amyloliquefaciens* bacteria on earthworms. **Applied Soil Ecology**, 96:159-164.

Paul, B.K., Vanlauwe, B., Hoogmoed, M., Hurisso, T.T., Ndabamenye, T., Terano, Y., Six, J., **Ayuke, F.O.**, Pulleman, M.M. (2015). Exclusion of soil macrofauna did not affect soil quality but increased crop yields in a sub-humid tropical maize-based system. **Agriculture, Ecosystems and Environment** 208: 75-85.

Mbau, S.K., Karanja, N., **Ayuke, F.** (2015). Short-term 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.

Paul, B.K., Vanlauwe, B., **Ayuke, F.O.**, Gassner, A., Hoogmoed, M., Hurisso, T.T., Koala, S., Lelei, D., Ndabamenye, T., Six, J., e, M.M. Pulleman, M.M. (2013). Medium-term impact of tillage and residue management on soil aggregate stability, soil carbon and crop productivity. **Agriculture, Ecosystems and Environment** 164 (2013) 14– 22.

Ayuke, F.O., Karanja, N.K., Awiti, A. (2013). Soil Macrofauna in soils under differing levels of disturbance and land use intensity in Kakamega District, Kenya. *East African Agricultural and Forestry Journal*. **East African Agricultural and Forestry Journal**, 78(1): 63-75.

Lelei, D.K., Karanja, N.K., **Ayuke, F.O.**, Kibunja, C.N, Vanlauwe, B (2013). Effects of soil fertility management practices on soil aggregation, carbon and nitrogen dynamics. **East African Agricultural and Forestry Journal**, 78(1): 113-118.

Ayuke, F.O., Brussaard, L., Vanlauwe, B., Six, J., Lelei, D.K., Kibunja, C., Pulleman, M.M. (2011). Soil fertility management: impacts on soil macrofauna, soil aggregation and soil organic matter allocation. **Applied Soil Ecology**, 48: 53-62.

Ayuke, F.O., Pulleman, M.M., Vanlauwe, B., de Goede, R.G.M., Six, J., Csuzdi, C., Brussaard, L. (2011). Agricultural management affects earthworm and termite diversity across humid to semi-arid tropical zones. **Agriculture, Ecosystems and Environment**, 148: 148-154.

Karanja, N.K., Mutua, G.K., **Ayuke, F. O.**, Njenga, M., Prain, G. and Kimenju, J. (2010). Dynamics of soil nematodes and earthworms in urban vegetable irrigated with wastewater in the Nairobi River Basin, Kenya. **Journal of Tropical & Subtropical Agroecosystems**, 12: 521-530.

Ayuke, F.O., Karanja, N.K., Muya, E.M., Musombi, B.K., Mungatu, J. and Nyamasyo, G.H.N. (2009). Macrofauna diversity and abundance across different land use systems in Embu, Kenya. **Journal of Tropical & Subtropical Agroecosystems**, 11 (2): 371-384.

Karanja, N.K., **Ayuke, F.O.**, Muya, E.M., Musombi, B.K., and Nyamasyo, G.H.N. (2009). Soil macrofauna community structure across land use systems of Taita, Kenya. **Journal of Tropical & Subtropical Agroecosystems**, 11 (2): 385-396.

Wall, D.H., Bradford, M.A., John, M.G.ST., Trofymows, J.A., Behan-Pelletier, V., Bignell, D.E, Dangerfield, J.M., Parton, W.M., Rusek, J., Voight, W., Wolters, V., Gardel, H.Z., **Ayuke, F.O.**, Bashford, R., Beljakova, O.I., Bohlen, P.J., Brauman, A., Flemming, S., Henschel, J.R., Johnson, D.L., Jones, T.F., Kovarova, M., Kranabetter, J.M., Kutny, L., Kuo-Chuan, L., Maryati, M., Masse, D., Pokarzhevskii, A., Rahman, H., Sabara, M.G., Joerg-Alfred, S., Swift, M.J., Varela, A., Vasconcelos, H.L., White, D. and Zou, X. (2008). Global decomposition experiment shows soil animal impacts on decomposition are climate- dependent. **Global Change Biology**, 14: 2661-2677.

Karanja, N.K., **Ayuke, F.O.** and Swift, M.J. (2006). Organic Resource Quality and Soil Fauna: Their role on the microbial Biomass, Decomposition and nutrient release patterns in Kenya Soils. **Tropical & Subtropical Agroecosystems**. 6: 73-83.

Ayuke, F.O., M.R. Rao, M.J. Swift and M.L. Opondo-Mbai. (2003). Impact of soil fertility management strategies on diversity and populations of soil macrofauna in agroecosystem. Special Issue: Sustainable use of land resources to alleviate poverty in the new millenium. **East African Agricultural & Forestry Journal**, 69 (1,2): 131-137.

Book chapters

Ayuke, F.O., B. Vanlauwe, Z. Zida, B. Ouattara, D. Lelei, D. W. Odee (2017). Management practices affects soil aggregation and SOM dynamics across Eastern and Western agro-ecological zones. Accepted for publication in **Borlaug LEAP Book** -BLFB1002

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.

Kihara, J., Mukalama, J., **Ayuke F.O.,** Njoroge, S., Waswa, B., Okeyo, J., Koala, S., Bationo, A. (2012). Crop and Soil response to tillage and crop residue application in a tropical Ferralsol in Sub-humid Western Kenya. In: Bationo, A., Waswa, B., Kihara, J., Adolwa, I., Vanlauwe, B., Saidou, K. (Eds), *Lessons learned from long-term soil fertility management experiments in Africa*, 3:41-57. Springer.

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., Mkwunye, U (Eds), *Fighting Poverty in Sub-Saharan Africa: The Multiple Roles of Legumes in Integrated Soil Fertility Management*, 4:67-83. Springer Science.

Ayuke, F.O., Karanja, N.K., Bunyasi, S.W. (2007). Evaluating effect of mixtures of organic resources on nutrient release patterns and uptake by maize. In: Bationo, A., Waswa B., Kihara, J., Kimetu, J. (Eds). *Advances in Integrated Soil Fertility Research in sub-Saharan Africa: Challenges and Opportunities*, 79: 833-844. Springer publishers.

Ayuke, F. O., Opondo-Mbai, M.L, M.R. Rao., Swift, M.J. (2004). Effect of Organic and Inorganic Sources of Nutrients on Soil Mineral Nitrogen and Maize Yields in western Kenya. In: Bationo, A (Ed), *Managing Nutrient Cycles to Sustain Soil Fertility in sub-Saharan Africa*, 4: 65-76. Academy of Sciences Publishers, Nairobi Kenya.

Ayuke, F. O., Opondo-Mbai, M.L, M.R. Rao., Swift, M.J. (2004). An assessment of Biomass Transfer from Green Manure to Soil Macrofauna in Agroecosystems-Soil Macrofauna Biomass. In: Bationo, A (Ed), *Managing Nutrient Cycles to Sustain Soil Fertility in sub-Saharan Africa*, 29: 411-422. Academy of Sciences Publishers, Nairobi Kenya.

Conference Proceedings and Reports

Mutua, G.K., Karanja, N.K., **Ayuke, F.O.,** Ndukhu, H. and Kimenju, J.W., (2011). The potential of *Bacillus subtilis* and *Rhizobium leguminosarium* in controlling plant parasitic nematodes in farmers' fields. African Crop Science Conference Proceedings, Vol. 10, pp 207-213. African Crop Science Society.

Ayuke, F.O., Karanja, N.K., Wickama, J, Awiti, A. and Hella, J. (2007). Soil fauna community structure across land management systems of Kenya and Tanzania. In: Njeru, R.W., Kagabo, D.M., Ndabamenye, T., Kayiranga, D., Ragama, P., Sallah, P.Y.K., Nkerabahizi, D., Ndayiragije, A., Ndiramiye, L., Night, G., Akinyemi, S.O.S and Kanuya, N. (eds), *Sustainable agriculture productivity livelihoods*. Proceedings of National Conference on Agricultural Research Outputs, 26-27 March, Kigali, Rwanda, pp. 396-406.

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