



Richard (Ric) Coe

Research methods expert in agricultural and environmental research methods, design and data analysis

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Employers: World Agroforestry Centre (ICRAF), Kenya
and Statistics for Sustainable Development, UK

Summary

A research methods expert dedicated to increasing the quality and relevance of research for development through improving research methods from conceptualization to interpretation and reporting. A statistician and biometrician with extensive experience of consulting and advisory work in international agricultural and environmental research organizations. A teacher of principles and practice of research design and data analysis. A researcher hoping to make research for development more effective.

Recent Experience

Research program and project planning	Strategic planning with World Agroforestry Centre, CGIAR Collaborative Research Programs and the McKnight Foundation's Collaborative Crop Research Program. Project planning – recent: Restoration for degraded lands in E and W Africa, Legume Pest and Diseases (Kenya), Sustainable Land Management (Tanzania), Trees food systems (Uganda, Ethiopia, Rwanda),
Study design	Development of research designs for a wide range of studies in agriculture and environmental research – researcher experiments, participatory experiments, soil and ecological surveys, participatory breeding and technology trials, qualitative and quantitative farmer surveys, participatory evaluation, intervention evaluation designs, large-N trials, Research-in-Development planned comparisons. Participatory experimental design processes. Using local knowledge.
Data analysis	Guiding and supporting analysis of survey, experiment and climate data including multi-environment crop trials, tree and soil biodiversity data, climate change and risk, participatory breeding and technology trials, baseline studies, carbon measurement. Participatory data analysis methods.
Research reporting	Joint publications of results. Running scientific 'Writesops' both face-to-face and online.
Research reviews	Reviewing research projects and compiling literature-based reviews and meta-analyses – recent example: Conservation agriculture with trees, <i>Faidherbia albida</i> and crop production, Land Health Surveillance.
Training in research design	Training senior scientists on research design (Kenya, Rwanda, Uganda, Mozambique, Malawi, India, Burkina Faso, Ethiopia and more). Training PhD students in 'Thinking scientifically' – online courses for CGIAR and RUFORUM. Face-to-face training for International Foundation for Science, Sokoine University of Agriculture, Bangor University, University of Berne, National University Rwanda. Training MSc students in Experimental Design at University of Reading, University of Berne, etc.
Research policies	Led ICRAF process of developing research policies on Research Quality, Data Management, Intellectual Property, Research Misconduct and Research Ethics.

Other recent responsibilities and activities

- Member of Editorial Boards of *Agriculture and Forest Meteorology*, *Experimental Agriculture* and *Agroforestry Systems*.
- Technical Advisor on Research Methods to the Regional Universities FORUM (RUFORUM).
- Advisor and trainer on research methods at School of Environment, Natural Resources and Geography, Bangor University, UK.
- ICRAF Publications Committee member.
- Grants advisor and trainer to the International Foundation for Science (IFS).
- Secretary of Liana (development NGO). Review and advise on project development.
- Consultant on research design to Cornell University, University of Copenhagen, McKnight Foundation, ICRISAT, CIAT, IITA, CCAFS, CGIAR-Drylands, CGIAR-Humid Tropics.
- Invited speaker Cornell University (USA), IBS (Australia)

Employment

2009 – current*	Principal Scientist - Research Methods at the World Agroforestry Centre (ICRAF), Nairobi, Kenya
2016 – current*	Director, research Methods, Statistics for Sustainable Development (SSD), Reading, UK
2009 - 2016	Research Methods Specialist, Statistical Services Centre, University of Reading, UK
2005 - 2008	Head of ICRAF/ILRI (International Livestock Research Institute) Research Methods Group, Nairobi, Kenya.
1994 - 2005	Principal biometrician and Head of Research Support Unit, World Agroforestry Centre (ICRAF), Nairobi, Kenya.
1990 - 1994	Senior biometrician, ICRAF, Nairobi, Kenya.
1983 - 1990	Lecturer, Department of Applied Statistics, University of Reading.
1980 - 1983	Research assistant, AGRIMET project, University of Reading.
1977 - 1979	VSO teacher, Benue State, Nigeria.

* Two simultaneous part time positions.

Publications

Google Scholar metrics

	All	Since 2012
Citations	4293	2429
h-index	28	21
i10-index	49	34

Selected Recent Publications

Journal articles

Coe, R., Njoloma, J. & Sinclair, F. (2016). Loading the dice in favour of the farmer: reducing the risk of adopting agronomic innovations. *Experimental Agriculture*.

Nelson, R.J., Coe, R. & Haussmann, B. (2016). Farmer research networks as a strategy for matching diverse options and contexts in smallholder agriculture. *Experimental Agriculture*.

Vanlauwe, B., Coe, R. & Giller, K.E. (2016). Beyond averages: New approaches to understand heterogeneity and risk of technology success or failure in smallholder farming. *Experimental Agriculture*.

- Derroire G., Coe R. and Healey J. (2016) Isolated trees as nuclei of regeneration in 1 tropical pastures: 2 testing the importance of niche-based and landscape factors. *Journal of Vegetation Science*
- Mathew, M. M., Munjuga, M. R., Cordeiro, N. J., Coe, R., Ofori, D. A., Simons, A. J., ... Jamnadass, R. (2015). Early survival and growth of *Allanblackia stuhlmannii* (Clusiaceae): a threatened tropical rainforest tree of high economic value in Tanzania. *African Journal of Ecology*, 53, 572–580.
- Bayala, J., Sanou, J., Teklehaimanot, Z., Ouedraogo, S. J., Kalinganire, A., Coe, R., & Noordwijk, M. Van. (2015). Advances in knowledge of processes in soil – tree – crop interactions in parkland systems in the West African Sahel : A review. *Agriculture, Ecosystems & Environment*, 205, 25–35. doi:10.1016/j.agee.2015.02.018
- Soini E. and Coe R. (2014) Principles for design of projects introducing improved wood-burning cooking stoves. *Development in Practice*. 24 (7), 908-920
- Nelson R.J. and Coe R. (2014) Transforming research and development practice to support agroecological intensification of smallholder farming. *Journal of International Affairs*. 67 (2), 107-127
- Coe, R., Sinclair, F. and Barrios E. (2014) Scaling up agroforestry requires research “in” rather than “for” development. *Current Opinion in Environmental Sustainability*. 6, 73-77
- Stern R.D., Coe R., Stern D.A., McDermott B.M. (2013) MSc Training in Research Methods Support. *Technology Innovations in Statistics Education* 7 (2)
- Siriri D., J. Wilson , R. Coe , M. M. Tenywa, M. A. Bekunda , C. K. Ong , C. R. Black (2013) Trees improve water storage and reduce soil evaporation in agroforestry systems on bench terraces in SW Uganda. *Agroforestry Systems* . 87, 45-58 DOI 10.1007/s10457-012-9520-x
- Tittonell, P., Muriuki, A., Klapwijk, C. J., Shepherd, K. D., Coe, R., & Vanlauwe, B. (2013). Soil Heterogeneity and Soil Fertility Gradients in Smallholder Farms of the East African Highlands. *Soil Science Society of America Journal*. doi:10.2136/sssaj2012.0250
- Bayala J., G.W. Sileshi, R. Coe, A. Kalinganire, Z. Tchoundjeu, F. Sinclair, D. Garrity (2012) Cereal yield response to conservation agriculture practices in drylands of West Africa: A quantitative synthesis. *Journal of Arid Environments* 78 13-25
- Kristjanson P., H. Neufeld, A. Gassner, J. Mango, F. Kyazze, S. Desta, G. Sayula, B. Thiede, W. Förch, P.K. Thornton, R. Coe (2012) Are food insecure smallholder households making changes in their farming practices? Evidence from East Africa. *Food Security* 4 381-397 DOI 10.1007/s12571-012-0194-z
- Shem Kuyah, Johannes Dietz, Catherine Muthuria, Ramni Jamnadass, Peter Mwangi, Richard Coe, Henry Neufeldt (2012) Allometric equations for estimating biomass in agricultural landscapes: I. Above ground biomass. *Agriculture, Ecosystems and Environment* 158 (2012) 216-224
- Shem Kuyah, Johannes Dietz, Catherine Muthuria, Ramni Jamnadass, Peter Mwangi, Richard Coe, Henry Neufeldt (2012) Allometric equations for estimating biomass in agricultural landscapes: II. Belowground biomass. *Agriculture, Ecosystems and Environment* 158 (2012) 225-234
- Monyo E.S. , S.M.C. Njoroge , R. Coe , M. Osiru , F. Madinda, F. Waliyar, R.P. Thakur, T. Chilunjika, S. Anitha (2012). Occurrence and distribution of aflatoxin contamination in groundnuts (*Arachis hypogaea* L) and population density of Aflatoxigenic *Aspergilli* in Malawi. *Crop Protection* 42 149-155.
- Cooper, P.J.M & Coe, R. (2011) Assessing and addressing climate-induced risk in Sub-Saharan rainfed agriculture. *Experimental Agriculture* 47 179-184
- Coe, R and Stern, R.D. (2011). Assessing and addressing climate-induced risk in Sub-Saharan rainfed agriculture: Lessons learned, *Experimental Agriculture* 47 395-410

Gathenya J.M., Mwangi H., Coe R. and Sang J. (2011) Climate and land induced risks to watershed services in Nyando basin, Kenya. *Experimental Agriculture* 47 339-356

Vanlauwe B, Kihara J, Chivenge P, Pypers P, Coe R, and Six J (2011) Agronomic use efficiency of N fertilizer in maize-based systems in Sub-Saharan Africa within the context of Integrated Soil Fertility Management. *Plant and Soil* 339 35-50 DOI 10.1007/s11104-010-0462-7

H. De Groote, Esther Rutto, George Odhiambo, Fred Kanampiu, Zeyaur Khan, Richard Coe, Bernard Vanlauwe (2010) Participatory evaluation of integrated pest and soil fertility management options using ordered categorical data analysis. *Agricultural Systems* 103 233-244

Coe R. (2010) Analysing ranking and rating data from participatory on-farm trials. *African Statistics Journal* 10 14-53

Bustanul Arifina, Brent M. Swallow S. Suyanto, Richard D. Coe (2009) A conjoint analysis of farmer preferences for community forestry contracts in the Sumber Jaya Watershed, Indonesia. *Ecological Economics* 68 2040-2050

Tittonell, P, A. Muriuki, K.D. Shepherd, D. Mugendi, K.C. Kaizzi, J. Okeyo, L. Verchot, R. Coe, B. Vanlauwe.(2009). The diversity of rural livelihoods and their influence on soil fertility in agricultural systems of East Africa – A typology of smallholder farms. *Agricultural Systems* 103, 83-97

Coe R. (2007) Analysing data from participatory on-farm trials. *African Statistics Journal* 4 89-121

Silim S.N., R. Coe, P.A. Omanga and E.T Gwata (2006) The response of pigeonpea genotypes of different duration to variation in temperature and photoperiod under field conditions in Kenya. *Journal of Food, Agriculture and Environment* 4, 209-214

Radersma S., C.K. Ong and R. Coe (2006). Determinants of water-use of tree-lines in sub-humid Western Kenya; importance of leaf area versus micrometeorology. *Agroforestry Systems* 66, 179-189

Weke PGO, Muchiri MW and Coe R (2006) The Bradley-Terry model for handling categorical response variables from farmer participatory trials. *Far East Journal of Theoretical Statistics*. 20 163-178

C.S. Gold, P.E. Ragamaa, R. Coe and N.D.T.M. Rukazambuga. (2005) Selection of assessment methods for evaluating banana weevil *Cosmopolites sordidus* (Coleoptera: Curculionidae) damage on highland cooking banana (*Musa* spp., genome group AAA-EA). *Bulletin of entomological research*. 95 115-123

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Books and book chapters

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Kay Muir-Leresche, and Richard Coe, with Adipala Ekwamu (2009). GEAR, Graduate Environmental and Agricultural Research: A Guide to Effective and Relevant Graduate Research in Africa. 277pp. RUFORUM, Kampala, Uganda

Kay Muir-Leresche and Richard Coe (2009) Your research proposal - hypotheses, objectives and research questions. Ch 2.3 in Kay Muir-Leresche, and Richard Coe, with Adipala Ekwamu (Eds.). 2009. GEAR, Graduate Environmental and Agricultural Research: A Guide to Effective and Relevant Graduate Research in Africa. RUFORUM, Kampala, Uganda

Richard Coe (2009) Designing experiments. Ch 3.5 in Kay Muir-Leresche, and Richard Coe, with Adipala Ekwamu (Eds.). 2009. GEAR, Graduate Environmental and Agricultural Research: A Guide to Effective and Relevant Graduate Research in Africa. RUFORUM, Kampala, Uganda

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Huising EJ, Coe R, Cares JE, Louzada JN, Zanetti R, Moreira FMS, Susilo F-X, Konaté S, van Noordwijk M, Huang SP (2008) Sampling strategy and design to evaluate below-ground biodiversity. 17-42 In Moreira FMS, Huising EJ, Bignell DE (eds) Tropical Soil Biology, Sampling and characterization of below-ground biodiversity. Earthscan, London

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Coe R (2005) Analyzing Data from Participatory On-Farm Trials In Gonsalves, J., T. Becker, A. Braun, D. Campilan, H. De Chavez, E. Fajber, M. Kapiriri, J. Rivaca-Caminade and R. Vernoooy (eds). 2005. Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook. International Potato Center-Users' Perspectives With Agricultural Research and Development, Laguna, Philippines; International Development Research Centre, Ottawa, Canada; International Fund for Agricultural Development, Rome, Italy. 3 volumes.

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Buyse W.; Stern R.; Coe, R.; McDermott B.; Muchiri S.; Okello M.; Kurji P.; Obudho E.; Mong'are P. (2005). GenStat 8th Edition for Everyday use. World Agroforestry Centre (ICRAF) 114 pp.

Stern, R.D., Coe, R., Allan, E.F. and Dale, I.C. (2004) Good Statistical Practice for Natural Resources Research. CABI Publishing, Wallingford, UK. 388pp

Patel, B.K., Muir-Leresche, K.A.M., Coe, R. & Hainsworth, S.D. (2004) The Green Book: A Guide to Effective Graduate Research in African Agriculture, Environment, and Rural Development. The African Crop Science Society, Kampala, Uganda. 241 pp +CD

Other

Hughes K, Oduol J, Coe R, Sinclair F and Peralta A. 2016. Guidelines for identifying and designing planned comparisons. ICRAF Nairobi, Kenya.

van Noordwijk M, Coe R, Sinclair F. 2016. Central hypotheses for the third agroforestry paradigm within a common definition. Working paper 233. World Agroforestry Centre (ICRAF), Nairobi, Kenya. DOI: <http://dx.doi.org/10.5716/WP16079.PDF>

Takoutsing B, Ayenkulu E, Tchoundjeu Z, Coe R, Nna D, Shepherd K. 2015. Land health surveillance for identifying land constraints and targeting agroforestry intervention in smallholder farming systems in Western Cameroon. ICRAF Working Paper No. 191. Yaounde, World Agroforestry Centre.

Beedy T, Njoloma J, Aynekulu E, Coe R, Takoutsing B, Shepherd K. 2015. Land health surveillance for four sites in Malawi, Working Paper Number 192, Nairobi, World Agroforestry Centre. DOI:<http://dx.doi.org/10.5716/WP14254.PDF>

Zomer RJ, Trabucco A, Coe R, Place F, van Noordwijk M, Xu JC. 2014. Trees on farms: an update and reanalysis of agroforestry's global extent and socio-ecological characteristics. Working Paper 179. Bogor, Indonesia: World Agroforestry Centre (ICRAF) Southeast Asia Regional Program. DOI: 10.5716/ WP14064.PDF

Franzel, S., Wambugu, C., Nanok, T. and Coe, R. 2013. The 'model farmer' extension approach revisited: Are expert farmers effective innovators and disseminators? In: CTA, Proceedings of the International Conference on Innovations in Extension and Advisory Services: Linking Knowledge to Policy and Action, November 15-18, 2011, Nairobi, Kenya. CTA, Wageningen, Netherlands.

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Soini, Eija and Richard Coe (2011) Assessing stoves in Northern Tanzania. Liana (NGO), Finland and Tanzania.

Coe R., Nielsen F , van Noordwijk M and Simons AJ (2009) Fraud in Tree Science. Working Paper 88, ICRAF, Nairobi, Kenya

Zomer RJ, Trabucco A, Coe R and Place F. (2009). Trees on Farm: Analysis of Global Extent and Geographical Patterns of Agroforestry. ICRAF Working Paper no. 89. Nairobi, Kenya: World Agroforestry Centre.

Arifin B, Swallow B, Suyanto, Coe R. (2008). A Conjoint Analysis of Farmer Preferences for Community forestry Contracts in the Sumber Jaya Watershed, Indonesia. ICRAF Working Paper 63. Nairobi: World Agroforestry Centre. 36 pgs

Coe, R. (2008). Designing ecological and biodiversity sampling strategies. Working Paper no. 66. Nairobi: World Agroforestry Centre. 21pp

Beniest, J., Coe, R., Poole, J., Ochieng, H., Vandenbosch, T., Bevernage-Janssens, A. (2008). Lessons learned from a blended learning event on 'Research methods - Thinking scientifically'. eLearning Africa 2008: 3rd International Conference on ICT for Development, Education and Training, May 28–30, 2008, Accra, Ghana. Accra: ICWE, 3p

Coe R and Lusiana B (2008) Review of methods for researching multistrata systems. Working Paper no 75. Nairobi: World Agroforestry Centre. 8pp