

# CURRICULUM VITAE

## Edmundo Barrios Nogueira

**Birthdate:** 27 August 1961

**Citizenship:** Venezuelan/Brazilian

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## EDUCATION

1992-1995 PhD – Soil Ecology  
Department of Biological Sciences  
University of Dundee, U.K. / International Center for Research in  
Agroforestry (ICRAF), Kenya.

1984-1988 MSc – Soil Ecology  
Center for Ecology and Environmental Sciences  
Venezuelan Institute for Scientific Research (IVIC).  
Caracas, Venezuela.

1979-1983 BSc – Biology  
Biology Department  
University of California, Berkeley, USA.

## **PROFESSIONAL EXPERIENCE**

2016-present Senior Scientist, Soil Ecosystem. World Agroforestry Centre (ICRAF) Nairobi, Kenya.

2013-present Co-leader Thematic Working Group 2 'Biodiversity & Ecosystem Services'. The Ecosystem Services Partnership. ([www.es-partnership.org](http://www.es-partnership.org))

2012-present Leader of Natural Resource Management Strategic Research Theme (SRT 2.3) in Humidtropics - the CGIAR Research Program (CRP 1.2) on Integrated Systems in the Humid Tropics ([www.humidtropics.cgiar.org](http://www.humidtropics.cgiar.org)).

2010-present Head, ICRAF's Living Soil Laboratory, World Agroforestry Centre (ICRAF), Nairobi, Kenya.

2010-2015 Senior Scientist, Land and Soil Management. World Agroforestry Centre (ICRAF), Nairobi, Kenya.

2008-2009 Giorgio Ruffollo's Research Fellow. Sustainability Science Program, Center for International Development, John F. Kennedy School of Government - Harvard University, Cambridge, MA, USA.

2007-2008 CNPq Visiting Researcher. Brazilian Agricultural Research Center for Soils (EMBRAPA – Soils), Rio de Janeiro, Brazil.

2005-2006 Scientific Coordinating Officer for Ecosystem Services in the Global project "Conservation and Sustainable Management of Below-Ground Biodiversity (CSM-BGBD)". TSBF-CIAT, GEF, UNEP.

2001-2006 Responsible for CIAT Microbial collections of Nitrogen Fixing Bacteria and Arbuscular Mycorrhizal Fungi.

2001- 2003 Project Manager for Latin America. Tropical Soil Biology and Fertility Institute of the International Center for Tropical Agriculture (TSBF-CIAT).

2001-2006 Senior Scientist. Tropical Soil Biology and Fertility Institute of CIAT (TSBF-CIAT).

1999-2000 Senior Scientist. Soils Project. International Center for Tropical Agriculture (CIAT)

1997-1999 Research Fellow. Soils Project. International Center for Tropical Agriculture (CIAT)

## **COMMITTEES AND TASK FORCES**

2016 Organizing committee of the 'Biochar Systems for Africa' International Workshop. World Agroforestry Centre (ICRAF), Nairobi, Kenya. 1-2 March 2016.

2015 Member of Scientific Committee. Wageningen Soil Conference 2015. 23-27 August, Wageningen, The Netherlands. (<http://www.wageningenur.nl/en/Research-Results/Projects-and-programmes/Wageningen-Soil-Conference/Organising-and-Scientific-Committee-WSC-2015.htm>)

2013-present Member of Editorial Board of the International Journal of Biodiversity Science, Ecosystem Services and Management. Taylor & Francis (<http://www.tandfonline.com/action/journalInformation?show=editorialBoard&journalCode=tbsm21#.VLO4Y1CUdVY>).

2013-present Member of the Global Soil Biodiversity Atlas Steering Committee. Global Soil Biodiversity Initiative ([www.globalsoilbiodiversity.org](http://www.globalsoilbiodiversity.org)).

2004-2006 CIAT's Biosafety Committee.

2004-2005 Convener of the Soil Biota and Ecosystem Services Task Force in the Global project "Conservation and Sustainable Management of Below-Ground Biodiversity (CSM-BGBD)". TSBF-CIAT, GEF, UNEP.

## **AWARDS, SCHOLARSHIPS AND FELLOWSHIPS**

2015 '2015 Arjuna Award' for the strongest empirical challenge to established theory related to agroforestry in paper Nyaga et al. (2015). World Agroforestry Centre Science Week 2015, Bogor, Indonesia.

2008-2009 Giorgio Ruffollo's Research Fellowship. Sustainability Science Program, Center for International Development, Harvard University, Cambridge, MA, USA.

2007-2008 Visiting Researcher Fellowship. Brazilian National Research Council – CNPq, Rio de Janeiro, Brazil.

2002 CIAT Strategic Research Fund Grant for research of Integrated Soil Fertility and Pest & Disease Management.

2001 Consultative Group on International Agricultural Research (CGIAR) Excellence in Science Award - Outstanding Partnership to Embrapa-Cerrados, Embrapa-

Agrobiologia, Corpoica-Colombia, University of Bayreuth-Germany, University of Paris-France, University of Uberlandia-Brasil, Universidad Nacional de Colombia-Palmira, Tropical Soil Ecology Lab IRD-France and CIAT's Soils Project in sustainable land management of acid soil savannas.

1992-1995 Joint Scholarship from BID-CONICIT and British Council.

1990-1992 UNIDO/ICGEB Fellowship at International Center for Genetic Engineering and Biotechnology (ICGEB), New Delhi, India.

1984-1988 Fundación Gran Mariscal de Ayacucho Scholarship.

1987 UNESCO grant to attend Nitrogen Cycling in Agricultural Systems Conference in Brisbane, Australia and to visit CSIRO units (Melbourne, Camberra, Brisbane and Atherton) and local Universities (University of Brisbane, University of Melbourne and LaTrobe University).

1980-1983 Fundación Gran Mariscal de Ayacucho Scholarship.

## **SELECTED PUBLICATIONS LAST 10 YEARS**

Orgiazzi, A.; Bardgett, R.; Barrios, E.; Behan Pelletier, V.; Briones, M.J.I.; Chotte, J-L.; De Deyn, G.; Eggleton, P.; Fierer, N.; Fraser, T.; Hedlund, K.; Jeffery, S.; Johnson, N.; Jones, A.; Kandeler, E.; Kaneko, N.; Lavelle, P.; Lemanceau, P.; Miko, L.; Montanarella, L.; Moreira, F.M.S.; Ramirez, K.S.; Scheu, S.; Singh, B.K.; Six, J.; van der Putten; W.H.; Wall, D.H. (eds.), 2016, Global Soil Biodiversity Atlas. European Commission, Publications Office of the European Union, Luxembourg. 176 pp.

Herrick J.; Beh, A.; Barrios E.; Bouvier, I. ; Brown, J.; Coetzee, M.; Dent, D.; Elias, E.; Havstad, K.M.; Hengl, T.; Karl, J.; Hanspeter, L.; Matuszak, J.; Ndungu, L.W.; Obersteiner, M.; Shepherd, K.D.; Urama, K.C.; van den Bosch, R.; Webb, N.P. 2016. The Land-Potential Knowledge System (LandPKS): mobile apps and collaboration for optimizing climate change investments. *Ecosystem Health and Sustainability* 2(3): 1-7.

Balvanera, P.; Quijas, S.; Martín-López, B.; Barrios, E.; Dee, L.; Isbell, F.; Durance, I.; White, P.; Blanchard, R.; de Groot, R. 2016. The links between biodiversity and ecosystem services. *Routledge Handbook of Ecosystem Services* (Potschin, M., Haines-Young, R., Fish, R., Turner, R.K.), pp. 45-49. Routledge, Taylor & Francis Group, London. <http://www.worldagroforestry.org/downloads/publications/pdfs/BC15608.PDF>

Mortimer, P.E.; H.Gui.; Xu, J.; Zhang, C.; Barrios, E.; Hyde, K.D. 2015. Alder trees enhance crop productivity and soil microbial biomass in tea plantations. *Applied Soil Ecology* 96: 25-32.

Nyaga, J.; Barrios, E.; Muthuri, C.W.; Oborn, I.; Matiru, V.; Sinclair, F.L. 2015. Evaluating factors influencing heterogeneity in agroforestry adoption and practices within smallholder farms in Rift Valley, Kenya. *Agriculture, Ecosystems and Environment* 212: 106-118.

Barrios, E., Shepherd, K.; Sinclair, F. 2015. Soil health and agricultural sustainability: the role of soil biota. In FAO. *Agroecology for Food Security and Nutrition: Proceedings of the FAO International Symposium*, pp. 104-122. Rome. <http://www.worldagroforestry.org/downloads/publications/pdfs/BC15637.PDF>

Prabhu, R., Barrios, E., Bayala, J., Diby, L., Donovan, J., Gyau, A., Graudal, L., Jamnadass, R., Kahia, J., Kehlenbeck, K., Kindt, R., Kouame, C., McMullin, S., van Noordwijk, M., Shepherd, K., Sinclair, F., Vaast, P., Vågen, T.-G.; Xu, J. 2015. Agroforestry: realizing the promise of an agroecological approach. In FAO. *Agroecology for Food Security and Nutrition: Proceedings of the FAO International Symposium*, pp. 201-224. Rome. <http://www.worldagroforestry.org/downloads/publications/pdfs/BC15638.PDF>

Pumariño, L.; Sileshi, G.W.; Gripenberg, S.; Kaartinen, R.; Barrios, E.; Muchane, M.N.; Midega, C.; Jonsson, M. 2015. Effects of agroforestry on pest, disease and weed control: a meta-analysis. *Basic and Applied Ecology* 16: 573-582.

Guerena, D.T.; Lehmann, J.; Walter, T.; Enders, A.; Neufeldt, H.; Odiwour, H.; Biwott, H.; Recha, J.; Shepherd, K.; Barrios, E.; Wurster, C. 2015. Terrestrial pyrogenic carbon export to fluvial ecosystems: Lessons learned from the White Nile watershed of East Africa. *Global Biogeochemical Cycles* 29: 1911-1928.

Coe, R.; Sinclair, F.L.; Barrios, E. 2014. Scaling up agroforestry requires a research 'in' rather than 'for' development. *Current Opinion in Environmental Sustainability* 6: 73-77.

Barrios, E.; Coutinho, H.L.; Medeiros, C.A. 2012 *InPaC-S: Participatory Knowledge Integration on Indicators of Soil Quality – Methodological Guide*. ICRAF, Embrapa, CIAT. Nairobi, 178 p. <http://www.worldagroforestry.org/downloads/publications/PDFs/B17459.PDF>

Barrios E., Sileshi G.W., Shepherd K., Sinclair F. 2012. Agroforestry and soil health: Linking trees, soil biota and ecosystem services. . In: Wall, D.H., Bardgett, R.D., Behan-Pelletier, V., Herrick, J.E., Jones, T.H., Ritz, K., Six, J., Strong, D.R., van der Putten, W. (Eds.), *Soil Ecology and Ecosystem Services*. Oxford University Press, Oxford, pp. 315-330. <http://www.worldagroforestry.org/downloads/publications/pdfs/BC12072.PDF>

Pauli, N.; Barrios, E.; Conacher, A.J.; Oberthur, T., 2012. Farmer knowledge of the relationships among soil macrofauna, soil quality, and tree species in a small holder agroforestry system of western Honduras. *Geoderma* 189-190: 186-198.

Pauli, N.; Barrios, E.; Conacher, A.J.; Oberthur, T. 2011. Soil macrofauna in agricultural landscapes dominated by the Quesungual Slash-and-Mulch Agroforestry System, western Honduras. *Applied Soil Ecology* 47: 119-132.

Fonte, S.J.; Barrios, E.; Six, J. 2010. Earthworm impacts on soil organic matter and fertilizer dynamics in tropical hillside agroecosystems of Honduras. *Pedobiologia* 53(5): 327-335.

Fonte, S.J.; Barrios, E.; Six, J. 2010. Earthworms, soil fertility and aggregate-associated soil organic matter dynamics in the Quesungual agroforestry system. *Geoderma* 155: 320-328.

Pauli, N.; Oberthur, T.; Barrios, E.; Conacher, A. 2010. Fine-scale spatial and temporal variation in earthworm surface casting activity in agroforestry fields, western Honduras. *Pedobiologia* 53(2): 127-139.

Welchez, L.A.; Ayarza, M.; Amezquita, E.; Barrios, E.; Rondon, M.; Castro, A.; Rivera, M.; Pavon, J.; Ferreira, O.; Valladares, D.; Sanchez, N.; Rao, I.M. 2008. No-burn agricultural zones in Honduran hillsides: better harvests, air quality, and water availability by way of improved land management. Investment Note for the Sustainable Land Management Sourcebook, World Bank, Agriculture and Rural Development Department. Pp 78-82.

<http://siteresources.worldbank.org/EXTARD/Resources/336681-1215724937571/eBook.pdf>

Barrios, E. 2007. Soil biota, ecosystem services and land productivity. *Ecological Economics* 64(2): 269-285. Special Issue: Ecosystem Services and Agriculture.

Velasquez, E.; Pelosi, C.; Brunet, D.; Grimaldi, M.; Martins, M.; Rendeiro, A.C.; Barrios, E.; Lavelle, P. 2007. This ped is my ped: Visual separation and NIRS spectra allow determination of the origins of soil macro-aggregates. *Pedobiologia* 51: 75-87.

Basamba, T.A.; Barrios, E.; Singh, B.R.; Rao, I.M. 2007. Impact of planted fallows and a crop rotation on nitrogen mineralization and phosphorus and organic matter fractions on a Colombian volcanic-ash soil. *Nutrient Cycling in Agroecosystems* 77(2): 127-141.

Barrios, E.; Delve, R.J.; Bekunda, M.; Mowo, J.; Agunda, J.; Ramisch, J.; Trejo, M.T.; Thomas, R.J. 2006. Indicators of Soil Quality: A South-South development of a methodological guide for linking local and technical knowledge. *Geoderma* 135: 248-259.

Chen, W.M.; James, E.K.; Coenye, T.; Chou, J.H.; Barrios, E.; De Faria, S.M.; Elliott, G.N.; Sheu, S.Y.; Sprent, J.I.; Vandamme, P. 2006. *Burkholderia mimosarum* sp.nov., isolated from root nodules of *Mimosa* spp. from Taiwan and South America. *International Journal of Systematic and Evolutionary Microbiology* 56: 1847-1851.

Basamba, T.A.; Barrios, E.; Amezcuita, E.; Rao, I.M.; Singh, B.R. 2006. Tillage effects on maize yield in a Colombian savanna oxisol: soil organic matter and P fractions. *Soil and Tillage Research* 91: 248-259.

Tscherning, K.; Lascano, C.E.; Barrios, E.; Schultze-Kraft, R.; Peters, M. 2006. The effect of mixing prunings of two tropical shrub legumes (*Calliandra houstoniana* and *Indigofera zollingeriana*) with contrasting quality on N release in the soil and apparent N degradation in the rumen. *Plant and Soil* 280(1/2): 357-368.

Giller, K.E.; Bignell, D.E.; Lavelle, P.; Swift, M.J.; Barrios, E.; Moreira, F.; van Noordwijk, M.; Barois, I.; Karanja, N.; Huisling, J. 2005. Soil biodiversity in rapidly changing tropical landscapes: scaling down and scaling up. In *Biological Diversity and Function in Soils* (eds M.B. Usher, R. Bardgett & D.W. Hopkins), pp. 295-318. Cambridge University Press, Cambridge.

Velasquez, E.; Lavelle, P.; Barrios, E.; Joffre, R.; Reversat, F. 2005. Evaluating soil quality in tropical agroecosystems of Colombia using NIRS. *Soil Biology and Biochemistry* 37: 889-898.

Barrios, E.; Cobo, J.G.; Rao, I.M.; Thomas, R.J.; Amezcuita, E.; Jimenez, J.J.; Rondon, M.A. 2005. Fallow management for soil fertility recovery in tropical Andean agroecosystems in Colombia. *Agriculture, Ecosystems and Environment* 110: 29-42.

Tscherning, K.; Barrios, E.; Lascano, C.E.; Peters, M.; Schultze-Kraft, R. 2005. Effects of sample post-harvest treatment on aerobic decomposition and anaerobic in-vitro digestion of tropical legumes with contrasting quality. *Plant and Soil* 269: 159-170.

Vanlauwe, B.; Gachengo, C.; Shepherd, K.; Barrios, E.; Cadisch, G.; Palm, C. 2005. Laboratory validation of a resource quality-based conceptual framework for organic matter management. *Soil Science Society of America Journal* 69: 1135-1145.

Chen, W.M.; De Faria, S.M.; Straliotto, R.; Pitard, R.M.; Simões-Araujo, J.L.; Chou, J.H.; Chou, Y.J.; Barrios, E.; Prescott, A.R.; Elliot, G.N., Sprent, J.I., Young, J.P.W., James, E.K. 2005. Proof that *Burkholderia* strains form effective symbioses with Legumes: a study of novel *Mimosa*-nodulating strains from South America. *Applied and Environmental Microbiology* 71(11): 7461-7471.

## INVITED PRESENTATIONS

Barrios E. 2015. The key role of agroforestry in the ecological intensification of agriculture. Eco-intensive agriculture conference, 21 April 2015. Netherlands' Royal Academy of Sciences (KNAW), Amsterdam, The Netherlands.

Barrios E. 2014. Soil health and agricultural sustainability. International Symposium for Food and Nutrition Security, 18-19 September, FAO, Rome, Italy.

Barrios, E.; Mortimer, P. Hidden capital: harnessing belowground biodiversity for sustainable agricultural landscapes. Key Note presentation, Science Forum 2011, World Agroforestry Centre, Nairobi, Kenya.

Barrios, E. Fostering knowledge sharing in resource management and adaptation to global change in Brazil. Science, Technology and Globalization Program Seminar Series, Belfer Center for Science and International Affairs, Harvard University, 2009. Cambridge, USA.

Barrios. E. Agroforestry Systems: Managing Ecosystem Services in Sub-Saharan Africa. World Agroforestry Center (ICRAF), Nairobi, Kenya, 2009.

Barrios, E. Soils, Biodiversity and Ecosystem Services in Tropical Landscapes. Center for Complex Systems Research, University of New Hampshire, 2009. Durham, New Hampshire, USA.

Barrios, E. Soil Biodiversity, Ecosystem Services and Land Productivity. Round table on Soils, Ecosystem Services and Land Use Planning. XXI Congreso Argentino de Ciencias del Suelo, 2008. San Luis, Argentina.

Barrios, E. Soil biota and agroecosystem function. FertBio'2004, 2004. Lages, Santa Catarina, Brazil.

Barrios, E. Development of an integrated approach for the biological management of soil fertility. XVI Latin American Congress and XII Colombian Soil Science Congress "CLACS 2004", 2004. Cartagena, Colombia.

Barrios, E. Soil fertility research in tropical Latin America. Presentation and panelist at Environmental Leadership Program of Lectures entitled 'Agriculture and the environment: bridging the divide', University of California at Berkeley, California, USA.

Barrios, E. Managing the genetic resource of the soil. Workshop at Rockefeller Foundation Bellagio Conference Centre: Soil fertility degradation in Africa: leveraging lasting solutions to a long-term problem, 2002. Bellagio, Italy.

Barrios, E. Organic resource quality, decomposition, nutrient availability and crop response. XV Latin American Congress of Soil Science, 2001. Varadero, Cuba.

**REVIEWER:**

2015 – Grant application submitted to International Foundation for Science (IFS), Sweden.

2014 – PhD proposal submitted to the C.T. de Wit Graduate School for Production Ecology & Resource Conservation (PE&RC) of Wageningen University, The Netherlands.

2013 – Grant application submitted to Mercator Research Program (Mercator Foundation Switzerland).

2005 – Millennium Ecosystem Assessment, invited Sub-global reviewer.

**Expert reviews conducted for:**

Ambio; Agriculture, Ecosystems and Environment; Agroforestry Systems; Agronomía Tropical; Agronomy Journal; Applied Soil Ecology; Biology and Fertility of Soils; Ecological Applications; Ecology & Society; Ecosystems; Environmental Science and Technology; European Journal of Soil Biology; Field Crops Research; Geoderma; Journal of Agricultural Education and Extension; Pesquisa Agropecuaria Brasileira; Plant and Soil; Science of the Total Environment; Soil Biology and Biochemistry; Soil Science Society of America Journal; Soil Research; Soil and Tillage Research.

**SOCIETIES AND NETWORKS:**

International Soil Science Society  
Soil Science Society of America  
Soil Ecology Society  
Ecosystem Services Partnership  
Ecological Society of America

**LANGUAGES:** Fluent in written and spoken English, Spanish and Portuguese.