



**RIO18**  
21st World Congress  
of Soil Science

**21 WORLD CONGRESS OF SOIL SCIENCE**  
Sunday 12 – Friday 17 August 2018  
Rio de Janeiro, Brazil

Rio de Janeiro August | 12 - 17

---

### **Agroecological Transitions to Promote Biodiversity Conservation and Provision of Ecosystem Services**

Heitor Mancini Teixeira<sup>1,2,3</sup>, Irene Maria Cardoso<sup>2</sup>, Felix Bianchi<sup>1</sup>

<sup>1</sup> Farming Systems Ecology Group, Wageningen University & Research, Wageningen, The Netherlands. Email: heitor.manciniteixeira@wur.nl; <sup>2</sup> Department of Soil and Plant Nutrition, Federal University of Viçosa, Brazil; <sup>3</sup> Forest Ecology and Forest Management Group, Wageningen University & Research, Wageningen, The Netherlands

Healthy soils are crucial for maintaining agricultural productivity, conserve biodiversity and deliver other ecosystem services, such as water regulation, carbon storage and nutrient cycling. However, soil management based on the strengthening of ecological processes is complex, context specific and has to fit the realities of farmer's production situations. Management guidelines should therefore be informed by integrated knowledge about the socio-ecological systems and functional ecology, brought together in interdisciplinary and participatory set ups. The international FOREFRONT Program, which was launched in 2016, brings together scientists from different disciplines and countries to link the landscape-transforming strategies of the various actors with the landscape consequences in terms of ecosystem services. In this Program, our current study aims to understand the linkages between farmers perceptions, ecosystem services and biodiversity in agroecosystems in Zona da Mata, Minas Gerais, Brazil. Combining participatory and analytical methods, the research was developed in co-creation with farmers and other local stakeholders, creating a synergic and action-oriented approach. We constructed a farm typology to understand the implications of farm diversity for promoting agroecological transitions and agrobiodiversity conservation; used a semi-quantitative methodology to unravel the contrasting and complex perceptions of farmers on ecosystem services and their management and; selected representative farms under different management strategies to thoroughly assess the connections between farm management, soil quality, diversity of soil microorganisms and diversity of plants in pastures and coffee fields. Agroecological farmers in our study showed a more complex perception on ecosystem services, which results into more diversified and autonomous agroecosystems as well as greater adoption of alternative management strategies. These results point out the potential of agroecology to enhance ecosystem services provision and biodiversity conservation, while taking into account local actors preferences and needs. The multi-level analysis of agroecosystems, including social and ecological components is crucial to grasp the complexity of realistic management scenarios and to design effective strategies to reconcile natural resources conservation and agricultural production.



**Brazilian Soil Science  
Society**



**2015**  
International  
Year of Soils

**Keywords:** Socio-ecological systems; participatory research; functional ecology; farm typology; soil quality

**Financial Support:** This work is funded by: the Interdisciplinary Research and Education Fund (INREF) of Wageningen University & Research; Stichting Het Kronendak; and the Brazilian agencies: Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).



**Brazilian Soil Science  
Society**



**2015**  
International  
Year of Soils