

9. Ecological intensification for a climate smart agriculture: applications from Senegal and Burkina Faso

Masse Dominique¹, Ndour-Badiane Ndèye Yacine², Hien Edmond³, Akpo Léonard-Elie⁴, Diatta Sekouna⁴, Bilgo Ablassé⁵, Hien Victor⁵, Diédhiou Ibrahima⁶, Ndiaye-Cissé Mame Farma², Tall Diouf Laure², Ndienor Moussa², Founoune Mboup Hassna³, Feder Frédéric⁷, Médoc Jean-Michel⁷, Lardy Lydie¹, Assigbetsé Komi¹, Cournac Laurent¹

¹LMI IESOL, UMR Eco&Sols, Institut de Recherche pour le Développement, BP 1386 Centre ISRA IRD Bel Air, Dakar, Senegal

²LMI IESOL, LNRPV, Institut Sénégalais de Recherche Agricole, Centre ISRA IRD Bel Air, Dakar, Senegal

³LMI IESOL, UFR SVT, Université de Ouagadougou, Ouagadougou, Burkina Faso

⁴LMI IESOL, Département de Biologie Végétale, Université Cheikh Anta Diop, Dakar, Senegal

⁵LMI IESOL, Département GRN/SP, Institut Nationale de l'Environnement et de la Recherche Agricole. Ouagadougou, Burkina Faso

⁶LMI IESOL, Ecole Nationale des Sciences Agronomiques, Université de Thiès, Thiès, Senegal

⁷LMI IESOL, UPR Recyclage et risques, CIRAD, Dakar, Senegal

In the context of environmental and socio-economic changes, sub-Saharan African countries will have to ensure their food security, while reducing its environmental footprint. It is assumed that to take up the challenge of climate smart agriculture, it is necessary to intensify ecological processes of agrosocioecosystems at the scales of the soil-plant system, the farmers' fields and the agro-ecosystems and also the territories. This ecological engineering approach is the framework of the researches led by the IESOL International Joint Laboratory "Intensification of agricultural soils in West Africa". For instance, studies concerning the management of organic matters and the nutrients cycles in peri-urban agriculture and in Pearl Millet cropping systems will be exposed. We tested intensification practices as crop livestock integration, urban waste recycling, more efficient fertilizer use, and degraded lands restoring in Senegal and Burkina Faso. This will lead us to propose some rules of thumb of future innovations in semi-arid agrosystems based on the recycling and the conservation of organic matter and nutrients.