

Editorial: Roles of agroforestry parklands in sustainable production of small farms in West Africa.

Josiane Seghieri

Éco&Sols, Univ. Montpellier, CIRAD, INRAE, IRD, Institut Agro, Montpellier (France). E-mail: josiane.seghieri@ird.fr

This article is distributed under the terms and conditions of the CC-BY License (<http://creativecommons.org/licenses/by/4.0>)

DOI: 10.25518/1780-4507.20511

The aim of the project *Roles of agroforestry in the sustainable intensification of small farms and food security of societies in West Africa* (RAMSES II, 2018-2022) was to provide different ways of intensification of the four most represented cereal agroforestry parklands in West Africa: *Faidherbia albida* (tree), *Guiera senegalensis* (shrub), *Vitellaria paradoxa* (shea tree), and *Piliostigma* ssp. (shrub). Field works were conducted in Senegal and in Burkina Faso. The project's last meeting was held in Wageningen (The Netherlands) from 13 to 17 June 2022. The main results were shared. They were updated in 2023 and are available in the *Deliverables*, *Publications*, and *Communications* sections of the project website, <https://www.ramsesiiagroforesterie.com>

This special issue is intended as a reference document providing some of the key research results from all the disciplines cooperating in the project on the three following topics:

- the current state of the parklands in West Africa (Ouoba et al., 2023; Zida et al., 2023);
- the main socio-ecological services these parklands potentially or effectively provide to smallholder productions (Clermont-Dauphin et al., 2023; Loireau et al., 2023; Sarr et al., 2023; Serpantié et al., 2023);
- the description of agroforestry innovation platforms set up in the project's field sites. These platforms aim to raise awareness among smallholders about the intensification of agroforestry practices (Brouwers et al., 2023; Fayama et al., 2023).

This is not an exhaustive compilation of the project results. Partners have also published their works in other journals, among others: Roupsard et al. (2020) on a new spatial analysis method of *Faidherbia albida* impacts on the associated crops; Seghieri et al. (2021) on the use of the Theory of Change (ToC) in the case study of the RAMSES II project; Leroux et al. (2022) on spatialized assessments of ecosystem service relationships in a *Faidherbia albida* parkland in Senegal; Diongue et al. (2022 and 2023) on the assessment and modelling of the hydrological impact of *Faidherbia albida* in Senegal; Sow et al. (2024) on the STICS soil-crop model used to explore the impact of a *Faidherbia albida* parkland on millet growth in Senegal, and other references displayed in the *Publications* section of the project website. Many communications were also displayed to several international congress (see the *Communications* section of the project website).

We hope that this special issue will provide BASE readers with an up-to-date knowledge on how agroforestry parklands in West Africa can contribute to the sustainable intensification of agricultural production. This is particularly crucial for smallholders in a region that suffers from food and climate insecurity in addition to various sources of instability (political, economic, terrorism).

Bibliography

Brouwers J. et al., 2023. First experiences to ground agroforestry Innovation Platforms into their local institutional context. *Biotechnol. Agron. Soc. Environ.*, 27(3), Colloque Agroforesterie en Afrique de l'Ouest, 205-214, doi.org/10.25518/1780-4507.20340

Clermont-Dauphin et al., 2023. *Faidherbia albida* trees form a natural buffer against millet water stress in agroforestry parklands in Senegal. *Biotechnol. Agron. Soc. Environ.*, 27(3), Colloque Agroforesterie en Afrique de l'Ouest, 182-195, doi.org/10.25518/1780-4507.20477

Diongue D.M.L. et al., 2022. Evaluation of parameterisation approaches for estimating soil hydraulic parameters

- with HYDRUS-1D in the groundnut basin of Senegal. *Hydrol. Sci. J.*, **67**(15), 2327-2343, doi.org/10.1080/02626667.2022.2142474
- Diongue D.M.L. et al., 2023. A probabilistic framework for assessing the hydrological impact of *Faidherbia albida* in an arid area of Senegal. *J. Hydrol.*, **622**, 129717, doi.org/10.1016/j.jhydrol.2023.129717
- Fayama T. et al., 2023. Caractérisation des acteurs de l'agroforesterie pour une co-conception de plateformes d'innovation suivant le transect Koumbia Guéguéré Dano au Burkina Faso. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 215-225, doi.org/10.25518/1780-4507.20407
- Leroux L. et al., 2022. A spatialized assessment of ecosystem service relationships in a multifunctional agroforestry landscape of Senegal. *Sci. Total Environ.*, **853**, 158707, doi.org/10.1016/j.scitotenv.2022.158707
- Loireau M., Fargette M., Dieng M. & Sall M., 2023. Cadre conceptuel pour l'étude de la relation société-milieu : attache et insertion au monde. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 163-181, doi.org/10.25518/1780-4507.20308
- Ouoba H.Y. et al., 2023. Structure des populations de *Vitellaria paradoxa* C.F. Gaertn. (karité) dans les parcs agroforestiers au Burkina Faso. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 121-133, doi.org/10.25518/1780-4507.20329
- Roupsard O. et al., 2020. How far does the tree affect the crop in agroforestry? New spatial analysis methods in a *Faidherbia parkland*. *Agric. Ecosyst. Environ.*, **296**, 106928, doi.org/10.1016/j.agee.2020.106928
- Sarr et al., 2023. Estimation of seasonal water use of *Faidherbia albida* (Delile) A.Chev. in a Sahelian agroforestry parkland. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 196-204, doi.org/10.25518/1780-4507.20512
- Seghieri J. et al., 2021. Research and development challenges in scaling innovation: a case study of the LEAP-Agri RAMSES II project. *Agrofor. Syst.*, **95**, 1371-1382, doi.org/10.1007/s10457-020-00532-3
- Serpantié G. et al., 2023. Services mutuels entre arbres, cultures et élevage dans les parcs agroforestiers de la zone sub-humide du Burkina Faso. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 145-162, doi.org/10.25518/1780-4507.204445
- Sow S. et al., 2024. Calibrating the STICS soil-crop model to explore the impact of agroforestry parklands on millet growth. *Field Crop Res.*, **306**, 109206, doi.org/10.1016/j.fcr.2023.109206
- Zida I., Sawadogo A., Djiguemdé S. & Bastide B., 2023. Fluctuation des populations et évaluation des dégâts des mouches de fruits (*Diptera* : Tephritidae) dans les parcs à karité de l'Ouest du Burkina Faso : cas du transect Koumbia-Dano. *Biotechnol. Agron. Soc. Environ.*, **27**(3), Colloque Agroforesterie en Afrique de l'Ouest, 134-144, doi.org/10.25518/1780-4507.20186

(14 ref.)