

# *les dossiers* **d'AGROPOLIS** INTERNATIONAL

*Expertise of the scientific community*

Special Partnership Issue



## **Agroecological transformation for sustainable food systems**

Insight on France-CGIAR research

Number 26  
September 2021





# Agroecological practices that benefit society and farmers

*An example in Itasy region, Madagascar*



▲ A rural landscape in Madagascar: crop and livestock farming. Imerintsiatosika, Itasy region, Madagascar. © T. Chevallier/IRD

Rural development projects should be assessed before large-scale farmer involvement. Scant data are available in African countries on the sustainability of farming systems to produce food, enhance smallholder incomes, and reduce greenhouse gas (GHG) emissions. This study\* was based on a rural development project in Madagascar that promoted agroecological practices—agroforestry, compost and systems of rice intensification (SRI). The potential benefits of the project were quantified by three indicators: GHG balance, economic benefits to farmers and effectiveness of economic GHG mitigation investments. These indicators were projected over a 20-year period according to three scenarios, i.e. two that differed in terms of two agroecological practice adoption levels were compared to a baseline scenario with no project intervention. Socioeconomic, crop yield and soil data were collected on 192 farms over five crop seasons (2013-2018). The GHG balance was estimated with 2 calculators: the

TropiC Farm Tool and the EX-Ante Carbon-balance Tool. **GHG emissions were reduced under both scenarios compared to baseline: -5.2 to -13.6 tCO<sub>2</sub>eq farm<sup>-1</sup> year<sup>-1</sup> for scenarios 1 and 2, respectively. The amount of carbon saved per euro invested was estimated at -0.25 tCO<sub>2</sub>eq euro<sup>-1</sup> and -0.41 tCO<sub>2</sub>eq euro<sup>-1</sup> (or 4 to 2.5 euros tCO<sub>2</sub>eq<sup>-1</sup>) under scenarios 1 and 2. Agricultural production and farmers' cash flow increased over the course of 20 years.** This study highlighted the potential of agroecological practices to improve the productivity and profitability of smallholder farming systems, while contributing to climate change mitigation. The findings should fuel current international discussions on the relevance of family farming in the climate change mitigation agenda.

\*This study was conducted with the support of the SoCa project funded by the Fondation BNP Paribas.

## Contacts

Narindra Rakotovoao (Université d'Antananarivo, Madagascar), nanaharisoa2@yahoo.fr

Tiphaine Chevallier (Eco&Sols, IRD, France), tiphaine.chevallier@ird.fr

Tantely Razafimbelo (Université d'Antananarivo, Madagascar), tantely.razafimbelo@gmail.com

## Other authors

Lydie Chapuis-Lardy and Alain Albrecht (Eco&Sols, IRD, France)

Sylvain Deffontaines (Agrisud International, Madagascar)

Syndhia Mathe (Innovation, CIRAD, France)

Mamonjiniaina Andriamirajo Ramarofidy, Tsifera Henintsoa Rakotoniamonjy and Adrien Lepage (Agrisud International, Madagascar)

Cargele Masso (IITA, CGIAR)

## For further information

Rakotovoao N.H., Chevallier T., Chapuis-Lardy L., Deffontaines S., Mathé S., Ramarofidy M.A., Rakotoniamonjy T.H., Lepage A., Masso C., Albrecht A., Razafimbelo T.M., 2020. Impacts on greenhouse gas balance and rural economy after agroecology development in Itasy Madagascar. *J. Clean. Prod.*, 291: 125220. <https://doi.org/10.1016/j.jclepro.2020.125220>

▼ Soil fertilization via composting. Composting workshop, Imerintsiatosika, Itasy region, Madagascar.

© T. Chevallier/IRD

