



Climate-Resilient Rice Breeding Programmes among Smallholder Farmers in Southern Madagascar: Performance and Adoption Trends,

Razafindrafitry Rakotoarivony¹, Tany Ravelonirainarivo², Hena Rafinana^{3,4}

¹ Department of Interdisciplinary Studies, National Centre for Applied Research on Rural Development (FOFIFA)

² Department of Advanced Studies, University of Toamasina

³ University of Fianarantsoa

⁴ University of Toamasina

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Correspondence: rrakotoarivony@outlook.com

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Author notes

Razafindrafitry Rakotoarivony is affiliated with Department of Interdisciplinary Studies, National Centre for Applied Research on Rural Development (FOFIFA) and focuses on Environmental Science research in Africa.

Tany Ravelonirainarivo is affiliated with Department of Advanced Studies, University of Toamasina and focuses on Environmental Science research in Africa.

Hena Rafinana is affiliated with University of Fianarantsoa and focuses on Environmental Science research in Africa.

Abstract

Rice is a staple crop in Southern Madagascar, where climate variability poses significant challenges to smallholder farmers. A systematic review and meta-analysis were conducted on published studies examining climate-resilient rice varieties and their impact on yield and farmer acceptance. Analysis revealed an average increase in rice yields of 15% with the adoption of these programmes, although variability existed across different climates and farming practices. The reviewed programmes demonstrated significant potential for enhancing crop resilience against climate shocks among smallholder farmers in Madagascar. Further research should focus on long-term yield stability and socio-economic impacts to inform policy decisions. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African, climate-resilience, meta-analysis, smallholder, breeding programmes, environmental science, adaptation strategies

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