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6th Global Summit on ENVIRONMENTAL HEALTH

April 14, 2025 | Amsterdam, Netherlands

Socio-demographic determinants of adoption of innovative technologies for soil fertility management in millet farming in Chadakori commune of Maradi region, Niger

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In Niger, agricultural production is threatened by a significant decline in soil fertility, caused by the negative impacts of climate change and harmful anthropogenic actions on productive ecosystems. The main objective of this study is to determine the factors influencing the adoption of innovative Soil Fertility Management (SFM) technologies in millet farming in Chadakori Commune, Maradi region, Niger. To achieve this, data were collected using semi-structured individual interviews, with the Kobo Collent data collection application. Multivariate probit modeling was used on a selected sample of 250 farmers to distinguish the factors influencing the adoption of innovative SFM technologies. The data were analyzed using STATA 15 software. The results revealed that among these innovative technologies, composting, zai, and assisted natural regeneration are the most effective and widely adopted by farmers, with adoption rates of 82.4%, 77.6%, and 65.6%, respectively. Furthermore, the model analysis shows that variables such as gender, marital status, age, education Level, and household size significantly and positively influence the adoption of innovative SFM technologies. Final, the results showed that the adoption of these innovative technologies has a positive impact not only on improving soil fertility but also on increasing agricultural yields. Thus, to succeed in combating the decline in agricultural soil fertility, policies should actively promote the adoption of innovative SFM technologies tailored to specific soil types and ecosystems, to encourage participatory diffusion among producers.

Biography

Saminou Harouna Hamissou is a dédicaces researcher at the West African Centre for Sustainable Rural Transformation (WAC-SRT), within the Faculty of Sciences and Techniques at the University Abdou Moumouni of Niamey (UAM), Niger. His work focuses on sustainable agricultural development, particularly the adoption of innovative soil fertility management technologies in millet farming. With a strong commitment to addressing food security and environmental sustainability, his current research explores the socio-demographic factors that influence technology adoption in rural communities, with a focus on the Chadakori commune in the Maradi region. His interdisciplinary approach combines agronomy, rural sociology, and development studies to identify practical solutions that can enhance agricultural productivity and resilience. Saminou's contributions support regional strategies aimed at improving livelihoods and promoting sustainable rural transformation in the Sahel. He actively participates in research collaborations and knowledge dissemination to advance agricultural innovation across West Africa.