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“Reconcile land system changes
with planetary health”

Beyond neglect: unlocking the drought resilience potential of underutilised plants and systems

DONG-GILL KIM¹, NGOSONG CHRISTOPHER², ROLDÁN TORRES-GUTIÉRREZ³, LÓPEZ-SÁNCHEZ RAÚL⁴, BETTINA EICHLER-LÖBERMANN⁵

¹*Hawassa University, Wondo Genet College of Forestry and Natural Resources, Ethiopia*

²*University of Buea, Dept. of Agronomic and Applied Molecular Sciences, Cameroon*

³*Universidad Regional Amazónica IKIAM, Live Science Fac., Ecuador*

⁴*University of Granma, Study Center for Plant Biotechnology, Cuba*

⁵*University of Rostock, Agricultural and Environmental Faculty, Germany*

Abstract

Escalating drought frequency and severity, driven by climate change, pose a significant threat to conventional agricultural systems and global food security. Underutilised plant species and agroecological practices, often originating from indigenous knowledge, present substantial potential for building resilience in vulnerable agricultural landscapes due to their inherent drought-resistant characteristics. This study investigated the capacity of underutilised plant species and agroecological practices to enhance drought resilience. A mixed-methods approach combined a literature review of drought impacts, drought-tolerant underutilised plant species and agroecological practices with case studies of diverse agroecosystems: the Chakra system (Ecuador), Enset (*Ensete ventricosum*)-coffee agroforestry (Ethiopia), multi-layered fruit tree landscapes (Cuba), and traditional African vegetables (Cameroon). Semi-structured interviews with local communities and subject matter experts further explored drought experiences, traditional water management, and underutilised plant species and agroecological practices utilisation. Findings reveal that underutilised plant species and agroecological practices can significantly improve food security through their nutritional benefits, environmental resilience, and economic viability. Their integration into agricultural systems promotes biodiversity, sustainability, and climate change adaptation and mitigation. However, realising this full potential necessitates targeted genetic improvement of underutilised plant species and agroecological practices, supportive policy frameworks, and increased consumer awareness. This research contributes a comprehensive understanding of drought resilience mechanisms inherent in these systems, offering a knowledge base to inform policy and empower local communities. The study underscores the transformative potential of integrating underutilised plant species and agroecological practices into mainstream agriculture, thereby strengthening global food security and fostering sustainable development and poverty alleviation through the valorisation of traditional ecological knowledge.

Keywords: Agroecology, Chakra system, drought, Ensete, fruit tree, traditional African vegetables, underutilised plant

Contact Address: Dong-Gill Kim, Hawassa University, Wondo Genet College of Forestry and Natural Resources, Wondo genet, Ethiopia, e-mail: donggillkim@gmail.com