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Reintegrating underutilised tropical plants into food systems for nutrition security and climate resilience

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Abstract

The global food system relies heavily on a limited number of major crop species, leaving many nutrient-rich and climate-resilient underutilised plants neglected. This overdependence poses significant risks to food and nutrition security, dietary diversity, and agricultural sustainability, particularly in tropical and subtropical regions. This narrative review synthesizes evidence from peer-reviewed literature published between 2000 and 2025, with studies selected based on nutritional composition, bioactive properties, and agronomic performance. The review focuses on selected underutilised plants, including Bambara groundnut (*Vigna subterranea*), African yam bean (*Sphenostylis stenocarpa*), garden egg (*Solanum aethiopicum*), and *moringa* (*Moringa oleifera*).

These species demonstrate superior nutritional profiles, characterised by high levels of protein, dietary fiber, essential minerals, and vitamins, alongside significant concentrations of bioactive compounds with antioxidant, anti-inflammatory, and antidiabetic properties. In addition, many of these crops are well adapted to marginal environments, exhibiting tolerance to drought, poor soils, and low-input farming conditions, making them viable options for climate-resilient agriculture.

Their integration into local diets and food systems can directly contribute to reducing malnutrition, addressing micronutrient deficiencies, and improving human health and well-being. Furthermore, the cultivation of underutilised crops supports agrobiodiversity conservation, enhances soil health, and promotes diversified livelihoods, thereby contributing to sustainable rural development and local economies through value addition and commercialisation.

However, widespread adoption remains constrained by limited research investment, underdeveloped seed systems, low consumer awareness, and inadequate policy support. Addressing these challenges requires coordinated efforts, including investment in crop improvement and domestication, development of processing technologies, targeted nutrition education, and enabling policies to improve market access. This review provides an integrated perspective linking nutrition, health, and climate resilience of underutilised crops. Scaling their use represents a practical and underexploited pathway toward resilient, inclusive, and nutrition-sensitive agri-food systems.

Keywords: Biodiversity, climate resilience, food security, underutilised plants

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