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Integration of indigenous and scientific knowledge for climate resilience and food security in Africa’s urban agriculture: Learning from local communities for a sustainable future

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Abstract

Climate shocks such as prolonged droughts and heat continue to threaten agriculture and biodiversity that also translates to significant health risks and perpetuates insecurities and inequalities. The impacts of climate change are more severe in poor and marginalised populations with limited resources to respond to climate shocks. Hence urban agriculture in Africa is increasingly becoming recognised for its contributions to fighting climate change. While this might be the case, the use of indigenous knowledge practices and crop species in urban agriculture has remained underutilised and neglected both in policy and practice. Most of indigenous knowledge in farming practices is less documented and limited to specific locations such as rural and indigenous communities. Interventions to integrate urban agriculture in Africa’s urban development have been focused more on conventional agriculture that relies on scientific knowledge application and large-scale mechanisation to increase efficiency and yields in food production. Such approaches have significantly ignored the use of indigenous knowledge which contribute to climate adaptation, resilience, food security, and environmental conservation. Moreover, less is still known about what scientific knowledge can do to learn from, complement and be integrated with indigenous knowledges to enhance climate resilience and improve food security among marginalised urban communities. Most scientific knowledge applications to Africa’s agriculture have been criticised for undermining local and indigenous knowledge and attempting to replace it. The aim of the study was to explore what modern scientific knowledge approaches can do to complement indigenous knowledge practices for climate adaptation, resilience and food security in home and community gardens. Using a mixed-method approach of interviews, surveys and remote sensing tools, evidence from a sample of 100 small scale farmers including gardeners in marginalised communities of Johannesburg, South Africa, was collected and analyzed. The findings of this study show that scientific knowledge complements indigenous knowledge systems by providing scientifically structured methods to visualise and test indigenous-informed hypotheses, enhancing climate forecasting and predictive modelling and maintaining local contexts and knowledge sources. While there are fundamental benefits of harmonising scientific with indigenous knowledge, scientific knowledge must be pursued with caution to ensure equity, data sovereignty, and the co-creation of knowledge.

Keywords: Adaptation, indigenous knowledge, urban agriculture