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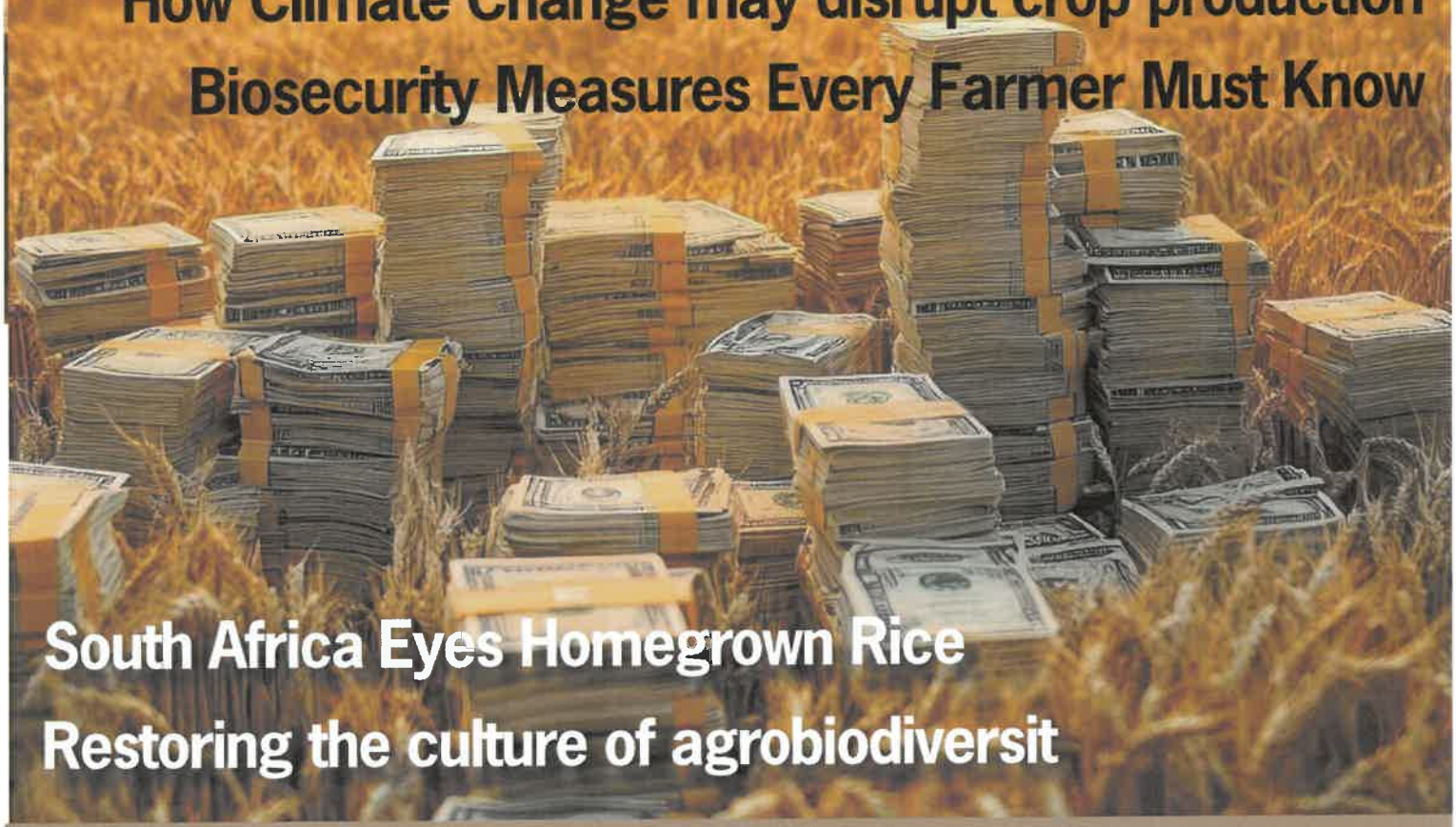

South Africa Eyes Homegrown Rice

Restoring the culture of agrobiodiversit

Vegetable pickles for the home kitchen

Restoring the culture of agrobiodiversity in communities

Zuma-Netshiukhwi Gugulethu
Mohapi Rethabile
Tshishonga Zwivhuya Osvaldo:
ARC: Natural Resources and Engineering: Agrometeorology and Climate Services
Matelele Lehlogonolo
Sithembiso Fakude
Department of Agriculture: Genetic Resources
National Plant Genetic Resources Centre

South Africa's agroecological zones are classified based on localised climatic conditions, elevation, and landforms to assess agricultural suitability, with key zones including dry sub-humid, moist sub-humid, arid, and semi-arid zones. These zones provide and support distinct farming systems and the varying length of the growing period. The length of the growing period is the number of days in an annum suitable for crop growth, determined by sufficient seasonal rainfall, soil water content, and thermal degree days. These environmental factors are key to consider when selecting crops in a particular agricultural zone. Agrobiodiversity entails a variety of crops, livestock, wildlife, trees, microorganisms, and agrifood systems. It thrives on diversity that strengthens resilience, sustainability, and food security. It includes landraces, indigenous species, underutilised species, locally adapted livestock breeds, farming practices, and indigenous knowledge systems. This paper investigates the possibilities of restoring the culture of agrobiodiversity in the Free State and Mpumalanga selected communities through the reintroduction of landraces.

Genetic erosion of seed landraces

Genetic erosion of crop landraces in the South African communities is rife. Thus, referring to the traditional, locally adapted crop type and crop varieties. The main contributors to the erosion of seed landraces in communities include a plethora of factors, such as the adoption of high-yielding varieties, which resulted in a drastic decline in indigenous crops; incentives given to farmers to produce uniform crop cultivars for commercial markets, depicting diverse landraces as less profitable; mechanised monoculture drastically narrowing the genetic base; environmental degradation exacerbated by climate variability and change; loss of interest in agriculture to loss of indigenous knowledge which stemmed to the abandonment of ancient agrarian practices; and the high intensity of use of pesticides and insecticides leading to a loss of landraces and the interests to retain such seeds. Agricultural landrace genetic loss is estimated at above 90% of crop types, and their accessions have disappeared

According to the South African scholars, crop landrace diversity is under threat due

to the high adoption of commercialised cash crops, the changing climate, and the growing population. The numerical approximation of total agricultural landrace loss country-wide is limited, except for selected underutilised crops categorically, leafy vegetables, grains, legumes, tubers, and medicinal plants, highlighting that amongst smallholder farming systems, landrace genetic erosion is a critical issue. Examples of these crops include Amaranthus species, traditional maize accessions, pulses such as Bambara nuts and cowpeas, and local sweet potatoes and potatoes. The key findings on landrace loss from the South African perspective indicate that the drivers of genetic erosion resulted from the shift from landraces to modern cultivars, that underutilised crops are vulnerable since farmers opt for high-input crop types, and that the loss of indigenous knowledge on seed preservation and agricultural practices. Furthermore, environmental stressors contribute to the risk of genetic decline, and studies and observations confirm the valuable traits of drought pliability and heat tolerance. There is a critical need to conserve landrace seeds and systematically document associated indigenous knowledge, particularly as these landraces are currently cultivated on a limited, small-scale basis within certain communities. Without deliberate conservation and knowledge-preservation efforts, both the genetic diversity and the cultural practices underpinning these landraces remain highly vulnerable to erosion.

Household to community seed landraces

Landrace seed preservation in innate South African communities operates along a continuum from household custodianship to broader community-based systems. At the household level, farmers maintain landrace seeds through producing, saving, selection, and exchange practices informed by indigenous knowledge and cultural traditions. These practices entail the annual gathering at the tribal authority compounds for the performance of seed exchange and blessing (Picture 1 a & b). These household-managed landraces form the foundation of community-based seed systems, where informal seed-sharing networks facilitate the circulation of genetic material and knowledge beyond individual families (Picture 1(c)). As these practices expand, they contribute to the emergence of community-based seed initiatives, such as community seed banks, which play a critical role in safeguarding landrace diversity, enhancing local seed access, and strengthening resilience to climate variability. However, without deliberate support and documentation, the transition from household to community landrace conservation remains fragile, placing both genetic resources and associated indigenous knowledge at risk of erosion. Landrace seed custodianship is the deliberate, intergenerational responsibility bestowed by smallholder farmers and communities to conserve, improve, and impart landrace seeds and local agricultural practices

Subsequently, the establishment of community-managed seed banks has gained increasing attention as a community-driven initiative for acknowledging, conserving, and promoting the utilisation of underutilised crops and agrobiodiversity. Nevertheless, the restoration of landrace seeds alone is inadequate. Without the revitalisation of farmers' localised knowledge, cultural practices, and local governance over seed

Picture 1. Landrace seed display during the seed and food fair and seed exchange networks

systems, these seeds cannot be sustainably maintained. This article, therefore, underscores the critical importance of restoring, preserving, and sustaining landrace seeds alongside indigenous knowledge systems and community-based seed governance to ensure their continued use and resilience within local farming systems.

Community Driven Agrobiodiversity Initiatives

The promotion of agrobiodiversity within communities plays a crucial role in restoring seed diversity and security. One of the most visible expressions of this is through community seed and food fairs, which are conducted annually in some South African rural communities. These events not only showcase the diversity of seeds conserved within communities but also facilitate the exchange of indigenous knowledge, cultural values, and belief systems associated with seed stewardship. Seed and food fairs provide an important social platform where communities collectively celebrate, transmit, and revitalise their agricultural heritage. Such community gatherings represent an integrated, living system in which crop diversity is actively maintained, adapted, and passed across generations. By recognising agrobiodiversity as a lived and dynamic practice, such community festivals reinforce resilient and adaptive local agricultural systems, enabling crop diversity to be sustained and disseminated from one generation to generations.

In achieving sustainable, localised agroecosystems, effective participatory approaches are imperative for the preservation of seed landraces, thereby supporting sustainable genetic resource conservation and the long-term viability of community seed banks. The approaches implemented include farmer-led seed selection and management, participatory plant breeding, participatory documentation of indigenous knowledge, and community-based seed governance, all which position farmers as active custodians of seed diversity rather than passive recipients. Through collective decision-making, knowledge co-production, and horizontal seed exchange, communities can maintain locally adapted landraces while revitalising cultural practices and strengthening informal seed networks. By integrating participatory approaches, community seed banks function as dynamic, living systems that support agrobiodiversity, resilience, and locally controlled seed systems.

The establishment of a localised community seed bank is established and governed through a locally developed constitution, collectively formulated and endorsed by community members to ensure transparency, collective responsibility, and communal ownership. The development of the constitution affords a common understanding as the constitution delineates rules and procedures for seed collection, access, storage, benefit-sharing, seed return, and decision-making, thereby institutionalising participatory seed governance. The six-cell analysis model participatory tool was used to determine the landrace seed status within local seed systems (Table 1, Pictures 2 & 3). It systemically analyses the typology of farmer groups maintaining landraces, the types of landraces available, underutilised, lost, and the wish list on crops that require reclamation and retention within communities. It further simplifies roles and responsibilities on the whole value-chain of seed production, crop type and cultivar selection, seed storage control, value-addition, benefit distribution, and consideration to social differentiation. Within communal seed banks, the six-cell analysis model provisions inclusive ownership, equitable benefit-sharing, and the design of interventions reflecting existing social dynamics.

Picture 2. Multiplication and adaptation sites for seed landraces in smallholder farmers

Table 1. The six-cell analysis model for seed landrace availability in South African communities

Categories	*Seed Availability Status*	*Source of Landrace Seeds*	*Strategic Action*
Common	Widely available: High seed security for staples	➢ The elderly in communities, ➢ National gene banks, ➢ Landrace seed organisations, ➢ Research Institutions, ➢ Smallholder farmers, and ➢ Other regions	Seed production for household consumption, for the local market, and to maintain purity
Niche	Available but limited: Mostly for household nutrition or other use		Knowledge of culinary and medicinal traits
Specialised	Locally available: Focused on culture preferences and agroclimatology zones		Linkage to value-added markets
Rare	Endangered: Landraces kept by farmers and available in certain areas		Priority for communal collection, seed recovery
Extinct	Unavailable: Landraces that are known about, heard of, or in distant gene banks		Seed scouting from national gene banks and other organisations promoting landraces
Wish list	Experimental: Introduced and/or migrated landraces		Participatory Variety Selection and establishment of multiplication and adaptation trials

The multiplication and adaptation trial site functions as a living laboratory where landrace seeds are grown, multiplied, and evaluated under local conditions. Organic farming principles guide all activities, avoiding synthetic inputs that could compromise seed quality or ecological balance. Farmers apply agro-ecological practices such as crop rotation, intercropping, composting, and natural pest management to strengthen soil health and maintain genetic integrity (Pictures 2 & 3). These practices allow seeds to adapt naturally to local environments, improving their resilience to climate stress, pests, and diseases. It is noteworthy to mention that the multiplication and adaptation trial sites are farmer-led, farm-maintained, and managed.

The project extends beyond crop cultivation, aiming to restore lost landrace seeds through participatory workshops, focus groups, key informants, seed showcases, and oral histories conveyed by elderly community members. Central to these activities was the guiding inquiry: *What has happened to landrace seeds that carry historical, cultural, high nutritional value, and sensory knowledge, yet have been forgotten?* Insights gathered indicate that the genetic erosion of agrobiodiversity is closely associated with the widespread adoption of commercial seed varieties and the related breakdown of intergenerational knowledge transfer. This has been the factual issue among cross-cultural and geological participants in Thaba Nchu and eMlondozi. The project adopts the agricultural school with the explicit objective of introducing learners to agricultural landrace crop types, seed management, and the importance of indigenous crops. The purpose is to engage younger generations in the conservation and stewardship of traditional crops, thereby addressing the discontinuity in knowledge transmission and promoting the sustained use and preservation of local genetic resources.

Interinstitutional and disciplinary collaborations amongst research and academic institutions, government agencies, and farming communities, landrace crops are preserved for living systems implanted within local agroecosystems, cultural practices, and food traditions. This collaborative approach strengthens community seed banks, facilitates intergenerational knowledge transfer, addresses genetic erosion driven by commercial seed systems, and enhances resilience, food sovereignty, and local control over seed systems

Policy

The strong collaborative efforts by the Department of Agriculture (DoA) and the Agricultural Research Council (ARC) have ensured the restoration and sustainable retention of crop-type landraces in their communities following the Food and Agriculture Organization (FAO) agrobiodiversity

Picture 3. Illustration of collected *landrace seeds displayed to the communities in the Free State*

principles. The implementation of these principles contributes to the sustainable use of plant genetic resources within local agroecosystems, with farmers recognised as key custodians of landrace diversity. The restoration of agrobiodiversity in communities allows for maintaining genetic diversity through on-farm and in situ conservation, which enhances resilience to climate variability and change, pests, and socio-economic shocks. Participatory approaches that integrate indigenous knowledge with scientific research, ensure equitable access to landrace seeds, and promote fair benefit-sharing are essential for strengthening local seed systems and sustaining agrobiodiversity.

Embedding agrobiodiversity in national frameworks and daily cultural practices is crucial for its lasting value. The recent ratification of the International Treaty on Plant Genetic Resources for Food and Agriculture by the DoA highlights a strong commitment to conserving and utilizing plant genetic diversity (DoA, 2025). This commitment recognizes community seed banks as key players, working alongside national departments, farmers, and research institutions.

When policy, research, and community practices align, they create a supportive environment for agrobiodiversity. For instance, seed-sharing rituals, seasonal fairs, farmer-led selection, and local markets can reinforce each other, fostering a vibrant agricultural ecosystem. In the Free State and Mpumalanga, the implementation of agrobiodiversity and communal seed banks is guided by the Plant Improvement Act 11 of 2016. This approach strengthens local agricultural practices and enhances the overall resilience and diversity of food systems in these regions.

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Enquiries: zumanetshiukhwig@arc.agric.za