

MKULIMA AI FIELD IMPACT REPORT

From the Soil to Al: How Mkulima Al is Transforming Rural Farming in Tanzania

Kisosa Village (Mount Uluguru) And Maekani Village (Morogoro Region)

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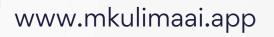
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A New Chapter for Rural Agriculture

In Kisosa and Maekani villages, a quiet revolution is taking root. Using an old HP laptop and deep belief in Mwalimu Nyerere's vision — "If real development is to take place, the people have to be involved". Erwin built Mkulima AI, the first offline Swahili-based AI for farmers.



This field report documents how 20 farmers (10 per village, representing 500 regional farmers) used Mkulima AI to diagnose and treat Gray Mold, Leaf Spot Complex, and Aphids, using agroecological, cost-free methods.





Digital Era

The Guiding Philosophy

"Intellectuals must use their knowledge for the benefit of the society of which we are all members." — Mwalimu Julius K. Nyerere. This principle is our foundation, ensuring that technology serves people, not the other way around.



The Tangible Action

Mkulima AI embodies this wisdom by transforming AI from a foreign concept into a community-driven tool for liberation. It actively restores power to those long excluded from data, technology, and agricultural equity.



Village Case Study 1: Kisosa (Mount Uluguru)

Strawberry Farmers vs. Gray Mold & Leaf Spot Complex



Farmers were trapped in a poverty cycle, reliant on expensive chemicals. Using Mkulima Al's agroecological treatments, their yield increased by +35% in one season, directly boosting the local food supply.

Climate Change and Food Security

The AI recommended treatments using milk, baking soda, wood ash, neem, turmeric, and garlic. This not only cured the diseases but resulted in stronger plant immunity and soil recovery, building a more resilient and secure farming system.

Agricultural Digitalization

Farmers utilized the offline, Swahili-based diagnostic model to identify the diseases themselves. This innovative approach directly overcame the critical barrier of the poor connectivity that plagues Mount Uluguru, providing a reliable solution where internet access is nonexistent and access to agricultural officers is severely limited.

The intervention broke the cycle of dependency. Farmers slashed pesticide costs from TZS 30,000–60,000 per month to under TZS 2,200 per batch, conserving financial resources and ending the use of soil-harming chemicals.

Resource Conservation





Village Case Study 2: Maekani (Morogoro)

Fighting Aphids the Agroecological Way







Efficient Use of Resources

Farmers replaced costly chemical solutions from agro-dealers with a homemade spray of liquid soap, cooking oil, and warm water. This slashed the total treatment cost to only TZS 2,000, demonstrating extreme resource efficiency.

Sustainable Land Management

The agroecological method resulted in no soil or crop damage, allowing for full recovery. This preserves land for future seasons, unlike harsh chemicals that degrade soil health over time.

Control of Plant Pests and Diseases

The system provided a precise diagnosis of aphid infestation. The recommended treatment was highly effective, with aphids disappearing after just one day, faster than the predicted 2-3 days, proving the superiority of ecological pest control.

Support for Local Communities

Mkulima Al empowered farmers with knowledge, breaking their dependency on external dealers. As one farmer testified, "Tulidhani dawa za dukani pekee zinafanya kazi. Lakini Al hii imetufundisha kutumia kile tulicho nacho nyumbani." ("We thought only shopbought medicine worked. But this Al has taught us to use what we have at home.")



Farmer Empowerment Beyond Treatment

"Technology with Soil on Its Hands"

From Data to Opportunity

The success of the agroecological treatments acted as a sensor, revealing new opportunities. Young women in Kisosa monitored the health and surplus of the strawberry harvest and initiated the production of strawberry yogurt and ice cubes.

Local Value Addition

Farmers applied biological processes to add value to their crops. In Maekani, this took the form of natural fermentation and preservation techniques to create and sell natural tomato paste in Mlali market.

Expanding Economic Networks

These new enterprises effectively map the expansion of economic activity from the field to the market. They chart a course from a village-level intervention to a broader regional trade network, demonstrating the scalable impact of the model.

Automating Knowledge, Unleashing Creativity

Mkulima Al automated the complex task of agricultural diagnosis, acting as a foundational "knowledge robot." This automation of expert advice freed human intellect and creativity to focus on building new, value-added agroecological enterprises.

Environmental and Economic Transformation

The implementation of Mkulima AI has catalyzed a profound agroecological transformation, fundamentally altering the economic and environmental landscape for farmers. Financially, it has liberated them from a cycle of dependency, slashing monthly chemical costs from a significant TZS 35,000-60,000 to a negligible TZS 2,000-2,500. This dramatic cost reduction is paired with a substantial boost in productivity, with crop yields surging by 35-40% above the baseline. Environmentally, the shift to organic treatments has halted soil degradation, initiating a vital process of regeneration that secures long-term fertility. Crucially, this entire shift was enabled by overcoming the digital divide; where once there was no support due to a lack of internet, farmers now have immediate, offline access to Al assistance in their native Swahili, putting the power of knowledge directly in their hands.

Reduction in agrochemical dependence

Restoration of biodiversity and soil health.

Increased household income and local market innovations.

Digital Inclusion and Human Dignity

Mkulima AI is built on the principle of radical inclusion, using a Swahili voice interface and icon-based navigation to dismantle literacy and language barriers. This ensures that every member of the farming community can fully participate: elder farmers can simply tap icons, women farmers actively co-develop and refine agroecological recipes, and youth leverage their tech-savviness to teach peers and document results with photo evidence.



This democratization of knowledge has fundamentally changed the farmer's relationship with technology. The tool is no longer a foreign gadget but an integrated part of their daily practice and learning. This transformation is perfectly captured in the reflection of one farmer: "Sasa simu yangu imekuwa mwalimu wangu" ("Now my phone has become my teacher.").

Global Message

The Message to the World:

What we've seen in Kisosa and Maekani is more than digital transformation.

It is a new model of African innovation grounded in community, ecology, and language.

This work addresses:

- SDG 1: No Poverty
- SDG 2: Zero Hunger
- SDG 9: Innovation & Infrastructure
- SDG 13: Climate Action





The Spirit of the Work

Guided by Mwalimu Nyerere's principle that "If real development is to take place, the people have to be involved," Mkulima AI is more than just technology, it is a bridge between data, artificial intelligence, and the soil. It is a tool that listens, learns, and speaks the language of the people it serves, becoming the farmer's new voice. Accessible in Swahili, offline, and in their own hands, it empowers communities by directly connecting them to the knowledge that cultivates the very land that feeds us all.

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