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Agentic AI and Community- Embedded DeFi: Tokenising Conservation as a Financial Primitive for Inclusion in Sub-Saharan Africa

Austin Namuye

HISA People Chain & KAI Protocol



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Austin Namuye | Founder, HISA People Chain & KAI Protocol | Kenya

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The convergence of agentic artificial intelligence (AI), decentralised finance (DeFi), and real-world asset (RWA) tokenisation presents a structural opportunity to redesign financial systems for communities historically excluded from formal banking infrastructure. In Kenya, where a significant share of economic activity is informal and embedded within community governance structures—savings groups, cooperatives, and forest associations—this convergence is operationally necessary, not merely theoretical. This paper proposes a framework in which community-managed natural capital is formalised as a tokenised, yield-generating financial primitive within decentralised systems. We introduce the Conservation Finance Stack, a modular architecture transforming ecological, cultural, financial, and human capital into interoperable on-chain assets, implemented through two live infrastructures—HISA People Chain and KAI Protocol—and grounded in real-world deployment with the Ololua Forest Community Forest Association in Kenya.

DeFi's adoption in Kenya remains constrained by three structural gaps: the absence of trust infrastructure aligned with community governance systems, inaccessible identity and verification mechanisms for informal actors, and the lack of intelligent interfaces capable of abstracting blockchain complexity for low-literacy users. Simultaneously, community-managed forests remain economically underutilised despite growing global demand for carbon credits, biodiversity financing, and climate-linked investment instruments. This creates a dual inefficiency in which financial systems exclude communities while conservation systems exclude capital. Addressing both simultaneously requires not incremental reform of existing financial infrastructure, but a purpose-built architecture designed from the ground up around community governance, ecological value, and AI-mediated access.

The Conservation Finance Stack

The proposed Conservation Finance Stack is structured across five layers. The Asset Layer captures community-managed natural capital—forests, biodiversity zones—represented through legally recognised governance structures. The Verification Layer integrates agentic AI with environmental monitoring tools to generate verifiable, real-time conservation data. The Tokenisation Layer converts these verified outputs into on-chain digital assets. The Financialisation Layer integrates these assets into DeFi infrastructure, enabling staking, collateralisation, and structured financial products. The Access Layer provides a conversational AI interface in natural language, eliminating the technical barriers that have historically excluded informal communities from blockchain participation.

HISA People Chain

HISA People Chain functions as an AI-mediated trust infrastructure built on four interconnected value layers. JANI encodes entire conservation processes—including reforestation initiatives like Jaza Miti at

Oloolua Forest—into verifiable digital assets using the Hedera Guardian framework, enabling continuous asset generation, transparent audit trails, and direct community participation in global climate finance markets. UMOJA provides an inflation-resistant financial asset system through commodity-linked and basket-based value representations, establishing a form of financial sovereignty for community members operating outside stable fiat currency environments. CHAT serves as both an agentic AI interface and a cultural economy engine, enabling communities to digitise and monetise oral histories, traditional knowledge systems, and ecotourism assets through accessible digital platforms. HISA integrates AI-assisted mental health and well-being infrastructure into the financial stack, recognising that human capital—and the resilience of individuals within community economies—is foundational to genuine and sustainable financial inclusion.

KAI Protocol

KAI Protocol provides a complementary DeFi banking layer tailored specifically to informal economies. It introduces stable-value savings instruments, AI-driven yield optimisation, community pension systems, and lending infrastructure designed for actors without formal credit histories or conventional collateral. Critically, tokenised environmental assets generated through JANI can be pledged as collateral within KAI, enabling Oloolua CFA members and similar communities to access credit based on verified conservation activity. This establishes a direct and novel link between ecological stewardship and financial opportunity—one that does not exist within any legacy banking infrastructure. Revenue flows from carbon and biodiversity markets, DeFi yield generation, collateralised lending, and cultural data monetisation collectively create a self-reinforcing model in which conservation is transformed from a cost centre into a productive financial asset class, with communities as active participants in value creation rather than passive beneficiaries of aid or subsidy.

Policy Implications and Kenya's VASP Act

Kenya's enactment of the Virtual Asset Service Providers (VASP) Act in October 2025—signed into law by President William Ruto—establishes the country's first comprehensive legal framework for virtual assets, placing joint oversight with the Central Bank of Kenya and the Capital Markets Authority. This is a direct and timely compliance opportunity for both HISA People Chain and KAI Protocol. Built on transparent, auditable Hedera Hashgraph infrastructure, both projects are structurally designed to operate within the VASP framework from day one. Kenya is therefore not only the deployment jurisdiction but a replicable regulatory model for community-embedded DeFi across East Africa—positioning early movers to define the standards that will govern the sector.

Conclusion

This paper demonstrates that financial inclusion and conservation finance can be co-designed within a unified decentralised architecture. Rather than treating conservation, finance, culture, and well-being as separate domains, the proposed framework integrates them into a single value system grounded in community governance and ecological stewardship. The system is operational at prototype level with deployed tokens, on-chain data structures, and active community engagement at Oloolua Forest in Kenya. The remaining challenges are not technical but institutional—regulatory alignment, capital mobilisation, and the policy imagination to recognise community-embedded DeFi as a legitimate instrument of both financial inclusion and climate finance. Kenya's VASP Act provides the legal foundation. What remains is the institutional will to build on it. Early adoption of tokenised conservation finance positions Kenya as a first mover in the next phase of decentralised financial infrastructure, where

natural capital becomes a foundational driver of economic value.

Keywords: *DeFi, financial inclusion, tokenisation, real-world assets, agentic AI, community forest governance, Hedera Hashgraph, Sub-Saharan Africa, carbon credits, conservation finance*

Presenting Author: Austin Namuye — Founder, HISA People Chain & KAI Protocol