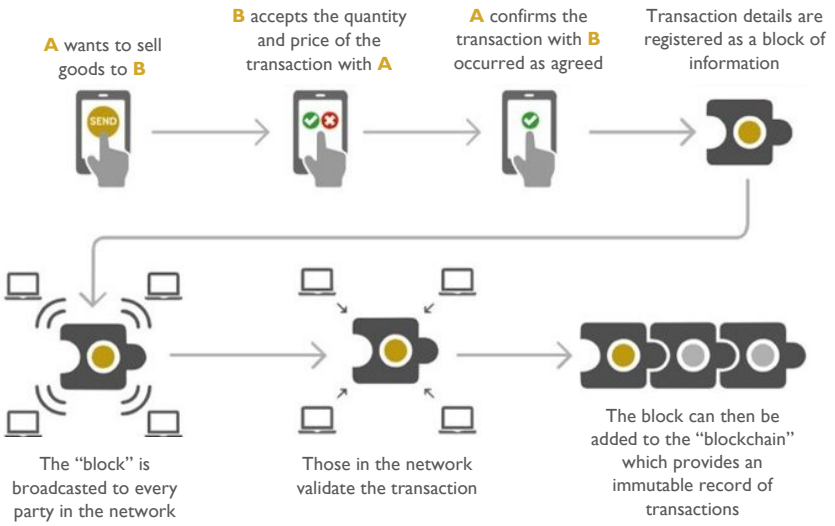
Linking the AgUnity Blockchain-based Platform to the Kenyan Agricultural Sector Transformation and Growth Strategy

LASER PULSE **Product Brief**

The AgUnity blockchain-based V3 Super App can contribute to improved livelihoods of smallholder producers in Kenya.

AgUnity is an Australian-based tech start-up that leverages the power of blockchain technology to improve the livelihoods of last-mile agricultural communities through improving the functionality of agricultural value chains. While AgUnity does not use cryptocurrency to operate their V3 Super App, they are able to use the distributed ledger functionality of blockchain technology to create a secure record-keeping system that logs transactions between value chain actors. In so doing, it creates trust and transparency in price setting, records the quality and quantity of produce exchanged and ensures actors have access to reliable market information and revenue and expenditure records. When integrated with the proper monitoring systems, information such as the application of pesticides and adherence to other food safety standards can also be transmitted along the value chain. Other value propositions of the AgUnity V3 Super App include verifiable identities of users, a management platform, and potential integration with a wide variety of other services (i.e., credit, index insurance, and/or extension services). It is important to note that users retain control of their information.



Overview of how the AgUnity app harnesses blockchain

Key Takeaways

1. Through **trust, transparency**, **co-operation** and **access to information**, blockchain technology *coupled with* complementary services will transform agricultural value chains.
2. The AgUnity V3 Super App contributes to improved food security by **improving incomes, reducing waste**, and **increasing the availability and desirability of nutritious and safe foods**.
3. Corruption and exploitation by dishonest brokers was significantly reduced through blockchain technology by creating a **network of trusted actors, using stardadized weights**, and providing **access to reliable market information.**

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In 2020, AgUnity, Virginia Tech, and Egerton University received LASER PULSE funding to investigate how blockchain might be used in the value chains for African indigenous vegetables (AIVs) to improve food security in Kakamega county. By providing information on the vegetables at the point of sale through the AgUnity V3 Super App, smallholder farmer incomes increased and nutritious leafy greens became more appealing to consumers.

Results demonstrate that the record-keeping functionality of the blockchain contributed to improvements in income by helping value chain actors: (1) negotiate more profitable prices for their products, (2) standardize quantities transacted (i.e., in kilograms), (3) communicate information on the grade of the vegetables, (4) increase the rate of credit repayment between actors, (5) decrease reliance on exploitative brokers, and (6) create reliable market information. Access to a smartphone has also allowed actors to coordinate more effectively, resulting in better-matched supply and demand. In turn, this has led to reduced post-harvest loss and time savings, which is especially relevant for women's empowerment.

> **"AgUnity has helped us to eliminate the broker, who exploited us in terms of prices and quantities. We can now sell directly to traders in the AgUnity system who are trustworthy and give fair prices."**
>
> ~AIV Producer, Butere, Kakamega

The AgUnity platform can be used by the Government of Kenya to accelerate progress towards the Agriculture Sector Transformation and Growth Strategy (ASTGS).

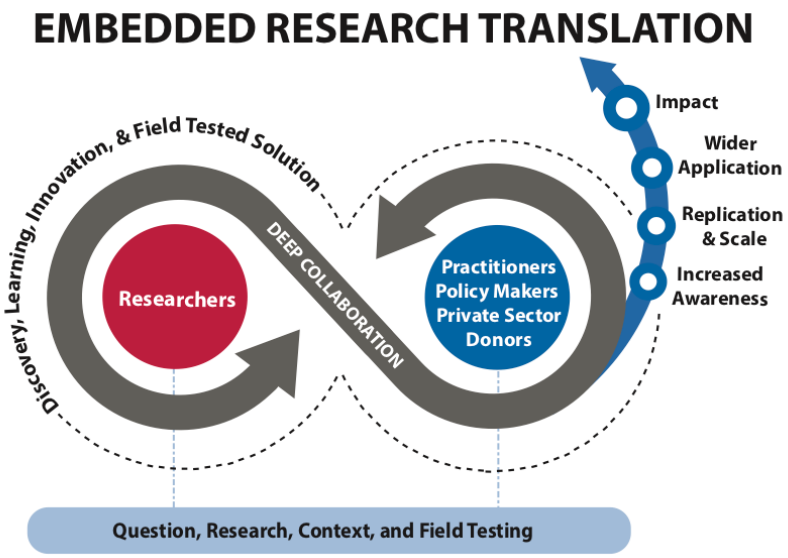
Since AgUnity users must have their identities verified before being onboarded, the app can be used as a mechanism to assist the GOK in registering farmers and creating a reliable and secure database of their information. The table below details further opportunities for the AgUnity V3 Super App to contribute to the achievement of each of the ASTGS anchors.

ASTGS Anchors	AgUnity Line of Business	Evidence/Opportunities
Increase small-scale farmer incomes	AgUnity's core blockchain-based transaction system (users transact by scanning QR codes).	• Record-keeping leads to household income enhancement via improvement of price, time, and resource efficiency. • AgUnity's record-keeping system helped to standardize the unit of measure of the goods transacted, which increases revenues and reduces loss throughout the value chain. • Access to trustworthy market information helped strengthen producer market power by helping them to advocate for better prices and reducing exploitation by brokers.
Increase agricultural output and value addition	AgUnity's core blockchain-based transaction system	• Blockchain-enabled traceability allowed farmers to capture a share of the price premium consumers were willing to pay for Grade A vegetables (i.e., pesticide-free, fresh, free of blemishes). • The AgUnity app could be used by the Kenya Bureau of Standards to verify requirements in various value chains if paired with a reliable monitoring system (i.e., participatory guarantee system).

ASTGS Anchors	AgUnity Line of Business	Evidence/Opportunities
	Services Platform	• Complementary services offered alongside blockchain-based record-keeping strengthen the value chains for AIVs in Kakamega. AgUnity plans to develop complementary applets that can offer critical services such as extension advising, weather information, credit, savings, etc. These services can contribute to improved productivity and value addition of priority agricultural goods.
	User profiles and management platform	• AgUnity registers users and verifies their identity. Therefore, the app can be used to register farmers, and manage certifications for village saving and loans groups, producer groups, and the Kenya Bureau of Standards. • Verifiable identity can assist farmers in accessing credit and e-vouchers that will allow them to invest in the expansion of their operations.
Boost household food resilience	Entire AgUnity platform	• AIVs became more consistently available and affordable in the market by limiting supply disruptions, eliminating exploitative brokers, and improving marketing efficiency. • Agricultural products that support nutrition and healthy diets can be prioritized (i.e., aquaculture, livestock, pulses/legumes)
	Education Platform	• Participants in the Kakamega project shared they learned more about the nutrition of indigenous vegetables while indicating they need considerable support in learning how to prepare them properly. • A cooking academy applet could be developed as part of AgUnity's education platform to show households how to prepare nutritious foods, like indigenous vegetables, to retain their nutritional value.

Our research revealed that integrating blockchain-based technology with other services can simultaneously address challenges faced throughout the value chain and contribute to constrained income and food security. The AgUnity V3 Super App can offer such services through the development of other applets that can be deployed on the platform. These applets can be developed through decentralized innovation processes – partnering with entities like the ICT Authority's White Box program, Safaricom, or other private sector or research institutions – to create or package the services necessary to accelerate the achievement of the ASTGS. For example, in November 2021, AgUnity in partnership with Egerton University and Virginia Tech hosted a hackathon where students developed applets deployable on the V3 Super App. Over three weeks, students developed new applets based on the principles of user-centered design to meet the needs of AIV value chain actors that had not yet been addressed in the scope of the LASER PULSE-funded project. The hackathon demonstrated that, if provided with a platform, Kenyan youth can use their skills and ingenuity to create solutions that can contribute significantly to the agricultural transformation agenda.

Forming a triumverate between the GOK, private sector, and academic institutions will lead to the development of solutions that are scalable, sustainable, and highly transformative.



The Long-term Assistance and Services for Research Partners for University-Led Solutions Engine (LASER PULSE) Embedded Research Translation (ERT) model for an iterative co-design process among academics, practitioners, and other stakeholders.

The research project conducted by Virginia Tech, Egerton University, and AgUnity has followed the embedded research translation model developed by LASER PULSE. This deeply collaborative process has led to the adaptation of the AgUnity app to the complex challenges faced by actors in the largely unorganized AIV value chain. It has also provided a framework for continual investigation and addressing of the barriers that might prevent scale, sustainability, and the deeper impact of the technology. Based on the GOK's vision for the agriculture sector and prioritization of food and nutrition security in the country, we posit that we can create a model for collaboration between the national and county governments, private sector, and academia that will provide an example of how to approach private sector engagement in a way that facilitates ethical and responsible social and economic impact. This partnership could include the formation of a working group, development of co-funding opportunities for business development, project implementation, and research, and co-creation of the approach to digital deployment in Kenyan agriculture and youth engagement to achieve the ASTGS.

An AIV farmer is trained on how to transact using the blockchain-based record-keeping system on the AgUnity smartphone application.

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