

# Smallholder Farmers Translating Produce to Profits

APRIL 2018

Innovative Models for Creating a Profitable Agribusiness that Builds Wealth in Small Farming Communities of East Africa



Seated on a row of plastic chairs beneath a shady mango tree are members of the Tana Farmers Group, a name taken from the river that flows nearby on its long journey east to the Indian Ocean. All eyes are on the man standing in front of them, Gabriel Kago, whose message provides hope for escaping poverty.

Annual profits from growing spinach for export, he says, are more than \$265-556 per quarter acre per grower—far more than a Tana farmer's typical take. But to realize this potential, the farmers will need to join a program managed by Akili Holdings, a Kenyan agriculture business committed to establishing mutually profitable commercial production agreements with smallholder producers.

Kago serves as the manager of Akili Holdings. He believes Akili has a plan for generating a healthy, reliable income from smallholder agriculture,

something that has eluded farmers in the Tana Group—and hundreds of thousands like them in the region. Crop production for these farmers typically provides an annual profit of only about \$116 per quarter acre. Yet even this modest sum is subject to considerable risks. Farmers who take the chance and invest in seeds, fertilizers, and herbicides can see a season's hard work decimated by drought, plant disease, or a pest invasion.

Akili is offering an alternative. They have developed an approach that seeks to address the risks inherent in agriculture, while taking advantage of the mild weather in Kirinyaga County, on the slopes of Mt. Kenya, that makes it an ideal location for producing beans, tomatoes, maize, spinach, and other food crops. With irrigation, spinach in particular can be grown year round in the region, allowing farmers to generate a fresh harvest every three or four months per year.

## The Spinach Proposition: Healthy Food, Prosperous Farmers

Akili has a contract to supply spinach to a buyer in the United States, Silva International, an Illinois-based company that sells dehydrated vegetables and fruit to the food industry. Silva's demands for spinach are large; it can take as much as Akili can supply, which has prompted Akili to seek out more farmers to produce the crop.

Akili's approach is to increase profits, for both its business and the farmers it recruits as contractors, by employing a system that reduces risks and offers a smarter approach to production. For example:

› **STABLE PRICES:** Akili's established relationship with the U.S. spinach buyer allows it to offer farmers a stable, year-round price of \$0.10 per kilogram. This guarantee removes the uncertainty and lack of transparency around pricing that has often left Tana farmers at the mercy of unscrupulous brokers who deliberately underpay for their produce.

› **RISK MITIGATION:** Akili offers farmers a form of low-cost crop insurance that guarantees farmers will earn money from their hard work, regardless of any damage their crop may suffer. Unlike many conventional insurance plans, which only reimburse farmers for production costs, the Akili plan compensates farmers for much of the profits they would have earned for a healthy harvest.

› **QUALITY INPUTS:** Akili provides farmers with spinach seedlings and an inputs package consisting of all inputs required for growing a healthy crop. This is critical for produce quality assurance as it ensures only acceptable inputs are used.

› **ACCESS TO FINANCE:** Akili offers farmers credit for obtaining inputs—and then recoups the loan by automatically deducting input costs from payments made to farmers for their spinach.

› **VALUE ADDITION:** Akili operates a collection center where harvests are dried and packaged for export to the United States. Akili also ensures the product complies with regulatory standards established by the U.S. Food and Drug Administration (FDA). Smallholder farmers in the region often miss out on market business opportunities because they lack processing options and the ability to meet regulatory and product quality standards, both of which can add considerable value to produce like spinach.

› **STANDARD CROPPING PROTOCOL:** Akili has an agronomist on staff who works with farmers to ensure they adhere to a standard protocol of productive and sustainable farming practices.



## Measuring the Akili Model

TechnoServe, a nonprofit that grows markets and incomes for small entrepreneurs and farmers in the developing world, worked in partnership with Akili to develop a detailed analysis of Akili's business model as it is being applied to spinach production.

Every aspect of the Akili system was carefully evaluated by TechnoServe's Innovation in Outcome Measurement (IOM) program. IOM measured precisely the productivity and profitability increases and risk reductions Akili farmers benefit from. Equally important, IOM evaluated how much profit this intense farmer engagement approach generates for Akili. The goal was to determine if the Akili model offered a roadmap for creating financially sustainable agribusinesses that increase incomes in smallholder farming communities.

For example, it has been determined that Akili breaks even on its investments once it has recruited 400 farmers and they are each producing irrigated spinach on a quarter of an acre for four seasons a year. Akili expected to achieve this within the first year of operation.

Their annual return was estimated to be \$149-440 greater than their regular return, earning them an additional \$59,400-176,000 a year as a group. Meanwhile, costs and profits can be calculated on a per-kilo-of-spinach basis. This method can help to isolate and quantify the costs and benefits of each aspect of such a carefully structured market system.

"I want to see a value chain that safeguards the rights of the farmers so that their bottom line rises in tandem with ours," says Haron Wachira, Akili's founder. A native of the Mt. Kenya region and a former PricewaterhouseCoopers partner, he has drawn on his grounding in rigorous accounting to create an agribusiness model that is a win-win situation for everyone.

Mr. Wachira won the backing of TechnoServe because his agribusiness model, which has already been applied to other crops such as mangoes and green grams, has demonstrated the potential to transform farmers' lives within a year. And it appears capable of sustaining those gains in future years.

## A Sustainable Way to Create Enduring Value

The Akili model shows that agribusinesses are a viable mechanism for farmers and buyers to engage in long-term business relationships that are profitable for both the farmer and the agribusiness. Farmer profitability (see table below), risk reduction, and access to finance incentivize farmers to participate in the program while agribusiness profitability provides the rationale for entrepreneurs to invest in such businesses. To set up such an agribusiness, an entrepreneur requires about \$150,000 in capex and a further \$30,000 in working capital to get the operation running in one year.

VARIABLE	UNIT	WORST CASE SCENARIO (PILOT)	EXPECTED VALUE (OPTIMAL PRODUCTION)
Farm gate price + ins. premium	KES/kg	10.71	10.71
Area cultivated	acre	0.25	0.25
Yield per quarter acre per season	kg	1,038	2,076
Number of seasons per year	#	4	4
Total annual production	kg/year	4152	8304
Annual cost of inputs	KES/farmer	17,124	31,656
Annual farm revenue	KES/farmer	44,468	88,936
Farm profit	KES/farmer	27,344	57,280
<b>Farm profit (\$US)</b>	<b>US\$/farmer</b>	<b>265</b>	<b>556</b>



## How it Works: Covering Risks, Increasing Rewards

---

For its spinach program, Akili is implementing a rigorous, highly organized system for both crop production and processing.

To start with, each farmer receives a step-by-step manual on how to grow baby spinach. The farmers are organized via the *Nyumba Kumi* system (*nyumba kumi* is Swahili for 10 houses). Each group of 10 farmers has a lead farmer who serves as the key point of contact with Akili. He or she receives training to learn group management skills and distributes inputs and conducts soil tests. The lead farmer also supervises the planting, harvesting, and collection schedule.

Akili assumes responsibility for providing farmers with quality seedlings, which are produced in its nurseries. They have a 90 percent germination rate and can be harvested after 45 days. An acre of land planted with 50,000 seedlings can realize more than 4 tons of baby spinach leaves every three-month season. Given Kenya's mild, sunny, equatorial climate, with irrigation, farmers can plant up to four times a year.

Akili further organizes farmers into production units that consist of 10 groups (for a total of 100 farmers per unit). Each unit has a designated collection center where farmers deliver their harvests. At the collection centers, the spinach is dried in kilns that are fired with rice husks. The dried spinach is then vacuum-packed to meet

both buyer and regulatory specifications and transported to Mombasa for export to the U.S.

Each farmer who joins the program is given an Akili card. This card can be read by the group leader's smartphone and is used to 'buy' inputs. But rather than being charged up front, the costs for the inputs are automatically deducted from the payments farmers receive for their spinach.

Farmer payments are made via mobile financial service platforms or directly to the farmer's bank account after they deliver their spinach to the collection center.

Akili also establishes an online "cloud profile" for each farmer. It includes the GPS-coordinates of their farm and is regularly updated with details on soil composition and fertilizer usage, as well as data on planting and yields, and a history of purchases and payments. This low-cost data collection system makes it relatively easy for Akili—and TechnoServe—to monitor and evaluate various issues, such as how crops respond to soil supplements and how different interventions impact yields and earnings.

Finally, Akili employs eTransact, a cashless electronic system with real-time inventory management that tracks business and operational transactions and reassures farmers of transparency at every point of the process.

## Structure that Reassures Risk-Averse Farmers

Meanwhile, back at the Tana Farmers Group, as the Akili recruiting session proceeds, faces relax. The Tana farmers seem assured by the detailed responses to their questions. Where do we get the seeds? How do we get paid? The answers also can be found in the four-page contract each woman and man is clutching. If the contract is signed by 10 members, their group will become a partner with Akili Holdings and their future could change for the better.

“We will switch to spinach because the exporter deals directly with us, and we can approach them to discuss raising the price. Also, the crop is insured against natural calamities,” says James Kamau, the group’s chairman.

For Akili’s Wachira, the model is solid and even a single container load produces significant cash flow for the company.

“Securing capital expenditure to achieve those first sales is the challenge,” he said. “Commercial lenders are risk-averse.” He suggests reform should come through social enterprises—agribusinesses whose long-term objectives include *both* the long-term welfare of the farmer and the financial health of the business—where donors can lend funding to accelerate and scale-up their investment into rural agricultural value chains and multiply the benefits to smallholders with 100 percent sustainability and a return on investment



many times that of normal development efforts.

Wachira and his colleagues at Akili believe their keys to success are the mass mobilization efforts that organize farmers into groups and units of growers and the efficiencies achieved by using information technology to monitor outcomes and conduct financial transactions.

“If there’s no reward for doing things our way, which at first may feel a bit uncomfortable, farmers won’t make the effort,” Mr. Wachira points out. “Then their standard of living will remain the same and our project will have been a failure. That’s why our package includes insurance, quality inputs, and access to credit. There’s one other essential factor for success. It’s mutual trust.”

## Estimating Benefits for Spinach Farmers

Experts with TechnoServe’s Innovation in Outcome Measurement project believe Akili’s easily scalable approach to producing spinach for export could offer a roadmap for creating financially sustainable agribusinesses that increases income for smallholder farming communities across a wide range of crops. The following are IOM’s estimates for potential outcomes generated by Akili’s value chain:

\$265-556 annually	\$106,000-176,000	\$15 million	100,000 Farmers
Value per farming household from linking farmers to export markets	Annual benefits across 400 farming households involved in spinach production for Akili in Year 1	Benefits from extending the project to 20,000 households over 5 years	Model scalable to 100K farmers in 5 years with other crops that have a similarly ready export market



## Metrics Measured by IOM and Projected Outcomes

**COMPLIANCE** with recommended spinach growing practices: 95 percent

**YIELDS:** near 100 percent of theoretical yield

**FARMER PROFITS:** \$265-556 per  $\frac{1}{4}$  acre per year ASSURED (*No uncertainty/risk*)

**ALLEVIATION OF FARMER RISKS:** Profits of \$265 are equivalent to normal or uncertain profits of \$420-881/year

**NET FARMER BENEFITS:** (compared to alternative) = +\$149-440 per  $\frac{1}{4}$  acre per year ASSURED, equivalent to +\$233-688/year

**AGRIBUSINESS PROFITS TO AKILI:** \$5.4 million over 5 years (*which may be used to set up value-addition infrastructure or distributed to farmers*)

**REDUCED COSTS** for drying and transport as the program expands

**EFFICACY** of the risk mitigation measures in reducing perceived risk

## Clouds that Clarify

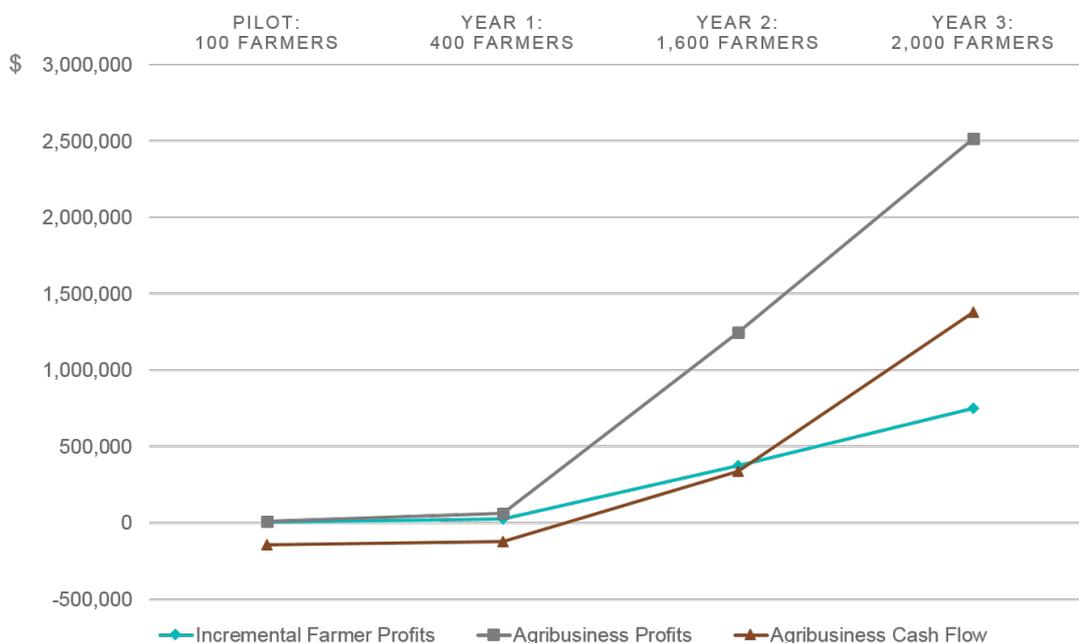
Akili is creating and storing farmer profiles in the “cloud” to facilitate outcome measurement. Each profile includes:

- › GPS coordinates for farm location
- › Measures of soil composition season to season
- › Protocol adherence, including to U.S. regulatory standards for production
- › Exact record of planting, fertilizer and pesticide use, and yield
- › Cash payments for crop delivery
- › Cashless purchases—seedlings, inputs, and irrigation supplies

## Commercial Viability of the Akili Model

An agribusiness running according to the Akili model parameters driven by a number of mobilized farmers will return profits within one year working with just 400 farmers. While gradually scaling to 2,000 farmers over two more years, the model will guarantee a highly profitable agribusiness that delivers incremental benefits for farmers as shown in the chart below. Initial investment gets recouped and positive cash flow is achieved within Year 2.

### Scaling Up: Profits and Cash Flow



## A Commodity Exchange: Modernizing Rural Agricultural Markets

In rural Kenya, agricultural commodities are mostly marketed via traditional or informal agricultural markets where trading is often a hazardous and costly affair. To find each other, buyers and sellers often travel great distances spending a great deal of time and incurring tremendous cost: buyers

to physically inspect the goods and sellers to safeguard their produce and receive payment. Farmers have the additional problem of little or no information on market prices and quality requirements, which traders exploit by offering them exploitative take-it-or-leave-it offers.

Finally, all these actors have very limited legal recourse in the event of contract default or cheating, reinforcing a culture of predatory competition and short-termism: a race to the bottom where farmers invariably lose the most.

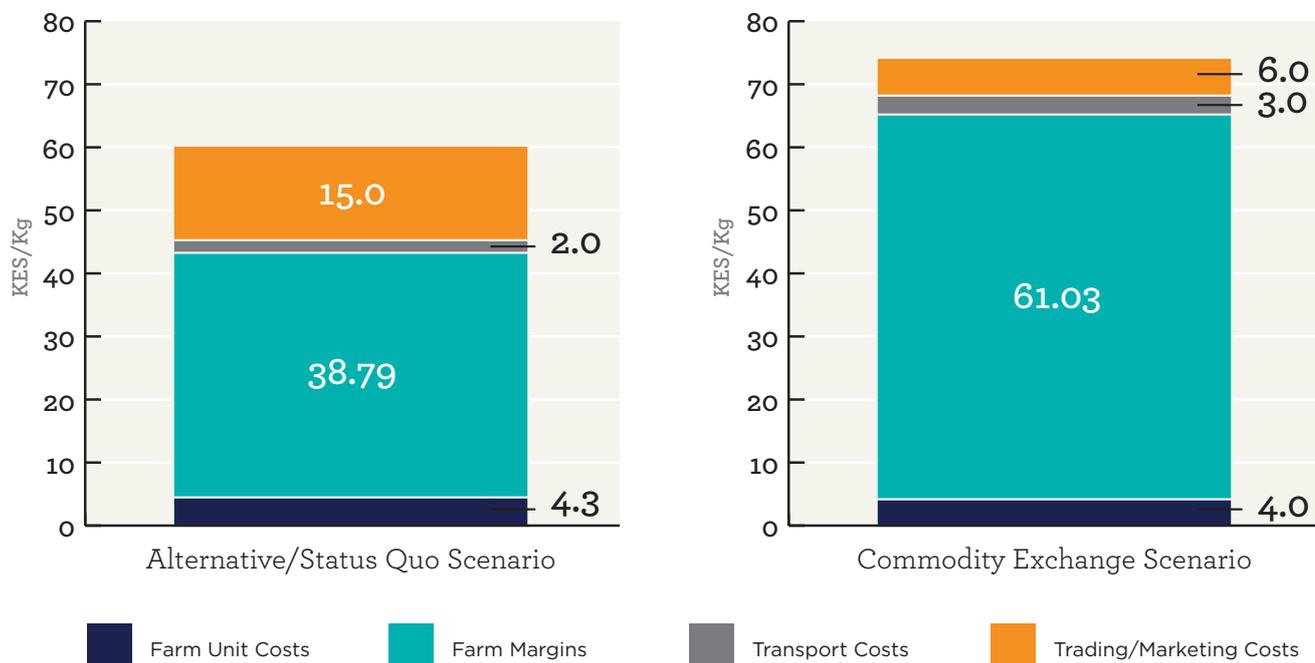
A commodity exchange solves these problems for all market actors. First, the exchange ensures the transparency of product pricing and quality, communicated to all actors via ICT. Second, lots to be auctioned on the exchange have a minimum weight of several metric tons of produce, meaning market traders must combine and formalize to operate on the exchange. This shift leads to fewer, larger buyers each moving larger volumes and profits but making smaller margins (sales commissions) rather than extorting individual farmers. Finally, sales support includes enforcement of strict regulations eliminating negative market behaviors.

IOM conducted an ecosystem assessment on the feasibility of establishing a commodity exchange in Kirinyaga and Embu Counties in Eastern Kenya.

The assessment found more than sufficient tradable volumes, the presence of all requisite market institutions, and services with sufficient capacity for all market participants. Based on the assessment, IOM modeled two scenarios for a mini commodity exchange: the first focusing on dry commodities and including a significant warehousing/warehouse receipts component; and the second focusing on perishable commodities which would only require storage for two to three days. Both would run on the same ICT platform and would be subject to similar trading rules and pre-and post-sale support.

The Kenya Capital Markets Authority has reviewed this assessment and is eager to incorporate the results of a pilot exchange into its commodities exchange policy and plans for the establishment of a national commodities exchange. Indicative numbers show that the commodity exchange would result in a significant increase in farmer margins (see charts below), with a projected \$3,350,000 in annual incremental profit for maize and beans farmers alone.

### Maize Value Chain Costs and Revenues: With and Without a Commodity Exchange



1120 19th Street NW, 8th Floor  
 Washington, DC 20036  
 +1 202 785 4515

[technoserve.org](http://technoserve.org)

Photography: TechnoServe



**TECHNOSERVE**  
 BUSINESS SOLUTIONS TO POVERTY