

Digitizing the agricultural value chain | **WHY**



PLANNING

- Help farmers plan what, when to plant
- Tighten relationship with buyers, processors
- Adapt to climate change
- Provide data for farmers to make business decisions on cash flow and maximizing profit



INPUTS

- Reduce counterfeits
- Reduce costs and risks for buyers
- Increase access to quality inputs
- Enable sellers to know demand in advance
- Provide convenient and secure ways for farmers to purchase, save, and receive credit inputs



ON-FARM PRODUCTION

- Help extension services reach more farmers
- Provide timely reminders/alerts
- Use behavior change media to promote best practices among farmers
- Increase precision and/or adaptability of farming interventions and crop choices through applied data



Storage

- Improve links between farmers, processors
- Reduce post harvest loss with digitally-enabled harvest loans and digitally warehouse receipts
- Inform harvest practices to reduce post harvest losses.
- Monitor storage conditions



POST-HARVEST

Processing

- Increase farmer negotiating power by providing market prices
- Track provenance for supply chain optimization and grading



Transport

- Reduce costs of transport
- Increase choice of different types of transport for farmers
- Increase access to timely information so that farmers know if and when transport is arriving



ACCESS TO MARKETS

- Increase ability of smallholder farmers to sell to larger markets by allowing buyers to track crops to source (certification and provenance)
- Increase market information available to farmers so that they have more choices

←----- USING CONNECTED DIGITAL TOOLS TO BETTER INTEGRATE THE ENTIRE MARKET SYSTEM -----→

Digitizing the agricultural value chain | **WHERE**



PLANNING



INPUTS



ON-FARM PRODUCTION



Storage



POST-HARVEST Processing



Transport



ACCESS TO MARKETS

DATA COLLECTION

Mobile Surveys
Sensors (ground, aerial, aquatic)
Low-Orbit Satellite Imagery
UAVs (Drones)
Farmer Profiles
Big Data Analytics

- Farm mapping
- Climate change predictive models
- Farm/farm group financial management

- Seeds
- Pesticides/Fertilizers
- Payments
- Rating service quality
- Soil/water testing

- Pesticides / Fertilizers
- Weeding
- Soil / Water
- Sharing Machinery, services
- Weather info

- Warehousing
- Pests
- Preservation

- Crop varieties, quantities planted
- Timing of planting, harvesting

- Preservation
- Climate Control
- On-demand transport/selling services

- Sales
- Payments
- Quality control
- Market prices

TRANSACTIONS

Mobile Money Payments/Storage
Bulk Payments
Savings Groups
Digital credit
E-Vouchers
POS Devices
Savings, Basic credit
Insurance premiums

- Savings
- Basic credit
- Insurance premiums

- Merchant payments
- Subsidies
- Savings and layaway plans
- Basic credit
- Leasing

- Payments for
- Info services
 - Vaccinations
 - Certifications
- Salary Payments

- Warehouse receipts
- Certifications
- Additional Inputs
- Loans

- Payments
- Insurance Payouts

- Transport fees
- Coop fees

- Payments from buyers to producers
- Savings
- Layaway

INFORMATION EXCHANGE

Video
Mobile (voice, text; push pull; IVR)
Radio/TV

←----- Extension Delivery ----->

←----- Market prices ----->

←----- Farmer Profiles to Enable Custom Info to be Delivered ----->

←----- Feedback to/from farmers, other stakeholders ----->

RISK MANAGEMENT

Insurance Verification
Satellite Imagery RFID Tags
Sensors Bar Codes
Digital Payments QR Codes
SMS/USSD

- Seeds
- Fertilizers
- Counterfeiting

- Weather insurance
- Better agriculture practices
- Market Prices

- Traceability
- Traceability
- Traceability

Digitizing the agricultural value chain | HOW



PLANNING

- FarmBook Business Planner
- mFarm
- CocoaLink
- iCow



INPUTS

- MyAgro
- Yelp for Cows
- GES eVouchers Nigeria



ON-FARM PRODUCTION

- Farm Radio Int'l (FRI)
- Digital Green
- Avaaj Otalo
- Health Network International (HNI)'s IVR service
- Hello Tractor (Nigeria)
- Farmerline



Storage

One Acre Fund harvest loans, East Africa



POST-HARVEST Processing

Nataal Mbay, Senegal



Transport

Loop transport/selling service (India, Ethiopia)



ACCESS TO MARKETS

- Esoko market price service (Ghana, more)
- FreshPro, Kenya

MOBILE MONEY PRODUCTS FOR SAVINGS, PAYMENTS, CREDIT, AND INSURANCE

- CIAT Columbia
- Climate Change and ICT (CHAI) Uganda
- Satellite-Assisted Pastoral Resource Management, Ethiopia

- E-Verification, Uganda
- Index-based livestock insurance, Ethiopia
- AVANSE Haiti e-vouchers

- Kenya Simple SMS reminders
- Kenya Livestock Insurance Program

Senegal farmers cloud app with processors

Rural Distribution Network (RUDI), India

CIAT used multiple sources of big data to predict when to plant, what to plant. Farmers who listened avoided losing US\$3,000.

CHAI reduced crop loss by 40-65% by getting timely localized weather

In a one-year pilot of using **satellite imagery to support pastoral resource management** in Ethiopia, herd deaths fell by half.

Yelp for Cows: Crowd-sourced reviews led to 26% better service

18,000 farmers in Mali/Senegal use mobile layaway via **myAgro** to save for seeds and fertilizer. They're seeing yield increases of 50% to 100%. That translates into around \$150 more income a year

Digital Green: low cost video helped increase cost effectiveness, adoption of new technologies

FRI participatory radio led to 5 fold increase in adoption

Livestock Insurance meant households were 36% less likely to anticipate relying on distress sales of livestock and 25% less likely to reduce meals.

One Acre Fund: loan led to significant increases in farmer storage and subsequent farm profits.

Naatal Mbay, the farmer-owned cloud database, resulted in better prices for higher quality fertilizer, more sharing of better agricultural practices, and ultimately a 25 percent increase in maize yields.

IDEO.org prototyped **Spoilage Sensor**, a \$4 temperature and-humidity sensor, which allows farmers time to act to prevent spoilage.

Loop farmers pay roughly 25% less to traders due to consolidation

With **Esoko**, all farmers get 8-9% price increase (not just subscribers), increasing income by \$170.

RUDI's mobile ordering has allowed 3,000 women retailers to increase their income by up to 300%, and farmers receive prices 20-30% higher.

In Haiti, a mango exporter saved more than \$1,600 per year by shifting purchases from cash to mobile.