



# OPEN DATA AND TRANSPARENT VALUE CHAINS IN AGRICULTURE

A REVIEW OF THE LITERATURE



RESEARCH NOTE



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# 1. Why should value chains be transparent?

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Information asymmetry is an economic concept that describes transactions where one party has more or better information than the other, creating an imbalance of power, leading one party in a transaction to unfairly benefit at the expense of the other. While the concept may seem somewhat theoretical, its real world consequences are felt in everyday dealings between actors from the most powerful governments and corporations to street vendors and villagers across the world. In the context of smallholder agriculture, which contains a large and at times complicated number of value chain actors, unequal access to information leads certain actors to be on the losing end of the transactions that take place within the value chain.

Smallholder farms in sub-Saharan Africa number around 33 million, represent 80% of all farms in the region and contribute up to 90% of food production in some sub-Saharan African countries.<sup>1</sup> Because of their relatively weaker position vis-a-vis the other value chain participants (in terms of finance, education, rural location and other factors), the smallholder farmer is often the one who is significantly more affected by unequal or insufficient information. While this gap in information is most acutely and directly felt in terms of markets and price, it is also equally pervasive in the planning, production and post-harvest management aspects of smallholder agriculture. For that reason, most of the interventions that seek to address the lack of information transparency affecting the farmer primarily target the market aspect, followed by the other areas.

Still, while the farmer remains the key beneficiary of projects intended to improve transparency in agricultural value chains, access to information is not a zero-sum game. Even as farmers receive better access to the information they need, other actors in the value chain have also sought to address their respective information gaps. To this end, second to the farmer, no value chain participant has received more attention in recent years than consumers, whose increased interest in knowing the source of the food they consume has led to a new emphasis on traceability.

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<sup>1</sup> 2005 data from Nagayets O (2005). Although the data is ten years old, it is still frequently quoted in the recent reports by the Food and Agriculture Organization of the UN (FAO) and the Overseas Development Institute (ODI) and others.

## 2. What we set out to find

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The interest in traceability and our broader understanding of how information asymmetry affects smallholder agriculture are developing in an era where unprecedented advances in information and communication technology (ICT) are taking place. The convergence of traceability and technology has led to countless interventions by governments, non-governmental organisations (NGOs), the private sector and any combination of the three to leverage ICT to address the problem of information access in smallholder agriculture. Generally speaking, these interventions have targeted their efforts in one of the following three categories: (1) ICT for production systems management; (2) ICT for market access services; and (3) ICT for financial inclusion.

**1. ICT for production systems management** comprises information that is linked to helping farmers improve their productivity and profitability while minimising their risks associated with unforeseen events and crises. The main services offered under this category include:

- Weather information;
- Advice on agricultural practices (extension service); and
- Emergency-related information (pest and disease outbreaks).

**2. ICT for market access services** comprise any service that facilitates beneficiaries' (especially farmers') access to information on the pricing of agricultural commodities as well as inputs, and connections to and knowledge of suppliers, buyers or logistics providers, including storage facilities and transport companies. These services also include ICT solutions that help the typically larger downstream firms, such as processors or exporters, to manage their operations efficiently. The main services offered under this category include:

- Pricing services;
- Trading platforms (such as commodity exchanges); and
- Traceability.

**3. ICT for financial inclusion** entails ICT solutions that allow formal and semi-formal financial institutions and direct value chain players (e.g. those using trade credit) to provide financial services in a more convenient, secure, flexible and low-cost manner. To this end, the services provided intend to help financial service providers extend their reach into remote areas by eliminating the need for full service branches. This also reduces costs while simultaneously improving access to financial services, by putting more direct control over how such services are used into the hands of local operators/agents and the customers themselves. The main services offered under this category include:

- Transfers and payments;
- Credit;
- Savings; and
- Insurance.

Open data is broadly defined as data that anyone can access, use and share to address problems that would otherwise be too challenging to resolve using closed data sources. In the context of agriculture, open data is expected to foster collaboration between government, the private sector, NGOs and other stakeholders to make new discoveries that help sustainably feed growing populations. In this regard,

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open data can play a pivotal role in breaking down the asymmetry of information that exists between value chain actors, making them more accountable to citizens, civil society and to other actors in those value chains. It can do so in several ways.

One way is by making large datasets available, which can stimulate new ventures and initiatives that provide farmers with advisory services that boost their productivity. Open data can also help governments, the private sector and other organisations partially outsource and/or crowd source their research data, increasing their sample base, but also making the research output more widely available to target users. In addition, open data also enables consumers to demand better standards by promoting transparency around sustainable food production and food safety, which would not only influence consumer behaviour, but also incentivise food producers to improve their performance. This would include things such as requiring the publication of information regarding ingredient lists, nutritional value, county of origin, etc.

While open data offers the possibility of greater transparency in agricultural value chains, it remains a relatively new concept and, as such, has yet to be fully exploited. Issues related to data management, licensing, interoperability and the capacity to implement open data initiatives are some of the challenges that have to be resolved in order to take full advantage of open data for value chain transparency. However, the trend of increasing technological innovation, ICT infrastructure and political will to make agriculture sustainable indicates that open data is sure to have a pivotal role in the coming years and decades.

This survey of the literature set out to establish how technology is being used to make value chains transparent and whether there are any initiatives that rely on or make use of open data as a tool for greater transparency. The findings would inform a meeting of stakeholders in the coffee value chain in the Democratic Republic of Congo at which those stakeholders present would explore how the value chain in which they are active participants could be made more transparent using open data.

## 3. What we found

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This section provides a general snapshot of current (and past) initiatives in the agricultural sector that seek to promote value chain transparency in Africa. The projects broadly cover the three areas of intervention – production, finance and marketing – where information asymmetry is pervasive. It is important to keep in mind that by no means does this represent a comprehensive list. New projects are being launched regularly. However, the similar nature of all the interventions is such that the cases included offer an accurate picture of what is being implemented on the ground.

### aWhere Weather

aWhere Weather is a free online platform that provides graphically displayed weather data – both historical and forecasts – for South Asia, and West, East, and Southern Africa. The observed and forecast station data comes from AWIS Weather Services, which aWhere then interpolates utilising surrounding weather stations to provide localised weather data in 9km grids. aWhere also plan to begin feeding in daily satellite-derived rainfall data for Africa (provided through NASA in conjunction with Colorado State University) to further strengthen the accuracy of the localised observed precipitation data.

Currently, the platform provides three to five years of historical data, daily observed data and forecasts on precipitation, minimum/maximum temperature, relative humidity and wind speed, solar radiation and accumulative growing degree days. All data is available for download in Excel format by users for further manipulation, such as for crop modelling or drought monitoring. Users can also sign up to receive daily or weekly email weather notifications for specific locations, which they can also format for SMS upon demand (although the platform cannot send SMS text messages directly). The daily notifications include daily observed data and an eight-day forecast, while the weekly notifications also include a ten-day history.

This initiative is currently funded by the Gates Foundation on an annual renewal basis. Use of the platform is free as long as funding continues from the Gates Foundation. Although aWhere Weather is currently free, aWhere generates revenue through fees from other modules (such as monitoring and evaluation) and services it offers. Other services, such as custom data delivery, including pest models, and drought or flood indices and models, can also be requested for a fee. There are currently more than 500 users of the platform, most of whom are development practitioners.

**Impact:** While an impact assessment has yet to be conducted, feedback from farmers, cooperatives and agri-service providers suggests that the forecast information has been beneficial to them. In addition, two other initiatives, Esoko and Farmerline, make use of aWhere weather data in their respective interventions.

**Use of open data:** aWhere Weather relies on open data sources such as NASA and provides its services for free on its website.

**Website:** <http://www.awhere.com>

## 3. What we found

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### GeoTraceability

GeoTraceability is a private agribusiness technology company that leverages GPS mapping – integrated into a customized GIS – to help clients meet traceability demands in the marketplace. In Ghana, they are mapping tens of thousands of cocoa and cotton farmers for Armajaro, the largest global buyer of Ghanaian cocoa beans, and feed this information into a GIS for employees (and a simplified web-based platform for clients) with unique information needs and levels of access. Each farmer receives a unique farmer ID-code, linked to his/her cocoa certification ID.

The process begins with the administration of a field-based questionnaire delivered on-farm by trained field surveyors, capturing information such as pesticide use, land tenure situation, date of plantation establishment, and key farm and community infrastructure. The surveyors use handheld Garmin GPS devices to accurately map the boundaries of farms, and the data is stored in the GPS until it can be uploaded into the database.

GeoTraceability has mapped 20 000 cocoa farmers in Ghana, covering 35 000 hectares across 15 districts. While it doesn't charge farmers, it charges clients to customise the database and establish the GIS, and there is a licensing fee per laptop. Mapping costs vary according to the context, but the cost for mapping cocoa in Ghana is approximately USD 15/hectare.

**Impact:** Using GeoTraceability, Armajaro has been able to quickly determine which cocoa plantations are the oldest to prioritise and target replanting efforts. Armajaro also discovered that actual average cocoa farm size is considerably smaller (1.1ha) than assumed (3ha). In addition, by mapping 3 000 cotton farms, Armajaro has also learned that farmers had vastly overestimated their farm size, purchasing more inputs (on credit) than they needed, which they struggled to repay at season's end. Now, farmers only get the volume of inputs they need and Armajaro is more confident it will recoup the advances.

**Use of open data:** GeoTraceability does not make use of open data

**Website:** [www.geotraceability.com](http://www.geotraceability.com)

### Dunavant

The largest cotton company in Zambia piloted the use of e-vouchers to simplify and streamline its financial transactions with 40 000 outgrowers from whom it sources cotton. The e-vouchers are redeemable for cash, merchandise and other services including school fees. During the redemption process, retailers confirm the farmer's identification and are immediately credited with the redeemed e-voucher's value. The entire e-voucher system and network was developed, and is currently maintained, by a private third-party ICT solutions provider, Zoona (formerly Mobile Transactions). All of the relevant actors (i.e. company, farmer and retailer) must establish an account with Zoona, which enables them to track, administer and manage their money transfers via the network. Using e-vouchers improves Dunavant's ability to track, monitor and administer payments to a large network of suppliers.

### 3. What we found

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Dunavant is using e-vouchers as a more efficient and secure means to pay its outgrowers. As the developer and administrator of the e-voucher network, Zoono charges a transaction fee, which is paid by the company. Dunavant deposits the full value of the e-vouchers into their Zoono account, which is used to make immediate payments to participating retailers upon redemption by the farmers. Zoono provides 'real time' reports on the distribution and redemption of e-vouchers by their targeted farmers with reduced administrative costs and improved targeting.

**Impact:** The company claims that the security concerns of remote rural staff associated with transporting and disbursing numerous cash payments have been reduced. Moreover, the registration of farmers has enabled Dunavant to build a database of its suppliers for the dissemination and compilation of information via mobile phones, increasing long-term efficiency. The system has also facilitated the ease of doing business by expanding farmer payment options at participating retailers. This reduces the risk generally associated with cash transactions to both farmers and retailers.

**Use of open data:** Dunavant does not make use of open data

**Website:** [www.zoono.co.za](http://www.zoono.co.za)

#### DrumNet

DrumNet offers support services to smallholder farmers in Kenya by providing access to information, financial services and markets using ICT, efficient business processes and economies of scale. It combines information, commodity transaction services and financial linkages into a single business service model that provides access to markets, market information and credit for the rural poor to support sustainable agriculture and rural development.

Farmers obtain inputs (e.g. seeds, fertilisers and pesticides) from local input providers using a pre-established line of credit from banks, particularly Equity Bank, via DrumNet. The platform also linked large-scale buyers, farmers, transporters and field agents through an integrated marketing and payment system. Before farmers plant crops, DrumNet negotiates contractual arrangements between buyers and farmers, and at harvest time coordinates produce aggregation, grading and transportation through agreements with local field agents and transporters. Immediately following a successful transaction, data is entered into DrumNet systems and bank account transfers are triggered to pay the participating value chain actors.

**Impact:** DrumNet facilitated and tracked payments for each seller, and credit was automatically repaid to Equity Bank when the produce was sold. The farmers obtained access to lower-cost finance from Kenya's largest bank by number of customers. They also benefited by not having to visit a distant branch or undergo an extended underwriting and disbursement process, taking them away from important activities in their fields. Bundling of the farmers into larger groups, improved risk assessment (credit scoring) and strong collateral (Bidco contracts) enabled Equity Bank to administer about USD 46 000 in loans to more than 4 000 previously unreachable farmers.

**Use of open data:** DrumNet does not make use of open data

**Website:** <http://www.poverty-action.org/organization/drumnet>

## 3. What we found

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### Sustainable Harvest

Sustainable Harvest's relationship information tracking system (RITS) allows coffee cooperatives to trace every step of the supply chain process starting from the grower using a cloud-based application. Using the system, the coffee coop manager is able to record individual coffee farmer deliveries, track the certification status of each delivery, process farmer payment, record quality-related information, bulk coffee deliveries according to quality, and generate reports on farm productivity, payments and samples.

Sustainable Harvest also launched RITS Ed, an iPad app that delivers agricultural training videos on organic coffee production and quality control that coop managers can use to assist their members. Sustainable Harvest has also launched an iPad app that will enable coop managers to input all of this information offline and then sync up to the online database as soon as they have internet connectivity. Furthermore, there are plans to launch RITS Metrics, a module that will help to expedite the application process for third-party certification through online data storage and more robust, customisable reports.

USAID provided the funding to support the implementation of two RITS pilots in Peru and Tanzania, with additional implementation support given by The Lemelson Foundation and supply chain partners. Initially the system is being piloted with two coops in Peru (representing 500 members) and one coop in Tanzania (working with 1 840 members). There are no fees to the end user associated with this application during the pilot and adaption phases.

**Impact:** Sustainable Harvest estimates that RITS reduces the time spent on collecting information for grower certifications by 65%. They are currently conducting ongoing monitoring and evaluation of their pilots to track gains in efficiency and cost reductions in operations and training.

**Use of open data:** Sustainable Harvest does not make use of open data

**Website:** [www.sustainableharvest.com/RITS](http://www.sustainableharvest.com/RITS)

### Index-Based Livestock Insurance

Index-Based Livestock Insurance (IBLI) was developed by the International Livestock Research Institute (ILRI) to insure vulnerable pastoralists in Kenya and Ethiopia, who often lose their primary asset – livestock – to the region's severe droughts. The IBLI product leverages the strong correlation between a remotely sensed vegetation index and livestock losses associated with forage shortages to offer insurance coverage to pastoralists in regions without access to conventional insurance products.

The IBLI product was first launched in January 2010 and is now available in several regions of northern Kenya and in the Borana region of southern Ethiopia. IBLI bypasses many of the transaction costs associated with conventional insurance by basing policies on signals that are easy to observe and generally uninfluenced by individual action. For IBLI to successfully mitigate the impact of drought shocks on the insured, the index must be highly correlated with covariate risk and covariate shocks must present a substantial risk.

### 3. What we found

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**Impact:** After a severe drought in 2011, the IBLI pilot made its first payout in the Marsabit district in northern Kenya in October 2011. Details of the payout are in Exhibit 6. A study conducted after the payout found that IBLI delivered the intended value to pastoralists. Exhibit 7 details the findings of the study. Insured households were 20–40% less likely to sell their livestock assets, or reduce spending on meals. Research would later show that IBLI reduced damage to the pastoralists' asset base, prevented harmful long-term consequences and brought down malnourishment rates in the region. The first payout results made a strong case for IBLI as an effective social welfare programme.

**Use of open data:** IBLI does not make use of open data

**Website:** <http://iblicasestudy.info/case-study/>

#### AgriManagr

AgriManagr is a software platform developed by Kenya-based supply chain management solutions company VirtualCity to improve the efficiency of outgrowing companies by automating the procurement process. The farmer's registration information, GPS coordinates of the transaction location and time of delivery are recorded at collection points using a mobile device (e.g. tablet or smartphone) enabled with AgriManagr.

The product is then weighed on a digital scale and recorded directly into the system (via a wireless connection), which calculates the payment owed. Farmers are sent an electronic receipt by email or given a printed receipt. The software also tracks transportation from collection point to the warehouse in real time and can be accessed by management. Drop-off weight at the warehouse is compared with pick-up weight and an exception report is automatically generated if the difference is greater than an allowable margin of error. The system immediately uploads information onto the network through mobile devices, or stores information offline until a data connection is available.

VirtualCity trains all users (especially farmers) to use the technology effectively and so develop trust in the platform. To use AgriManagr, which is currently operational in Kenya and Tanzania, companies pay a base price of USD 25/month per buying route plus additional costs based on the complexity of their supply chain. However, there is no fee for farmers to use the platform. The company believes that agribusiness operations sourcing through large-scale outgrower schemes – particularly those targeting export markets where traceability is essential – are ideally positioned to benefit from using AgriManagr.

**Impact:** Results from existing users have shown reduced weighing time at farm gate and a reduction of up to two months in the time it takes to pay farmers. In addition, farmers now have a balance sheet and record of all their transactions, which can be used as proof of income for banks or other institutions. This data trail is important, as farmers may not otherwise have any documentation crucial for getting loans.

**Use of open data:** AgriManagr does not make use of open data

**Website:** [www.virtualcity.co.ke](http://www.virtualcity.co.ke)

### 3. What we found

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#### The Shea Value Chain Reinforcement Initiative

The Shea Value Chain Reinforcement Initiative is a collaboration in Ghana between international business software provider, SAP, and Paris-based microfinance development organisation, PlaNet Finance, to use microfinance, education and technology to improve the incomes and living conditions of women who pick shea nuts and women who process nuts into shea butter. The shea nut is the seed of the tropical African shea tree, which grows wild and has fatty nuts that yield shea butter. Shea butter is mostly used in food and cosmetics. Although producing shea nuts and butter is one of the most accessible income-generating activities for rural women in Ghana, their incomes are unstable due to a lack of market information, inadequate business knowledge and low negotiating power

The programme organised the women into an association, called the StarShea Network (SSN), to give women more negotiating power, and give buyers access to larger quantities of products. The women were also trained on how to process better quality nuts and butter. Rural Market Connection (RMC), an order management and fulfilment software package, provides the buyer with transparency on historical product quality data and product traceability. Women get access to information through price updates via SMS text messages to mobile phones. The SSN website markets SSN products to the global market.

**Impact:** Typically women sell nuts in the summer due to lack of cash flow. However, in November 2010, SSN women sold over 93 metric tons of nuts to Olam International, a major buyer, earning .40 Ghana cedi per kilogram for premium nuts, and .35 cedi per kilogram for standard nuts. This represents a significant increase over the price they would have obtained had the nuts been sold in the summer.

**Use of open data:** The Shea Value Chain Reinforcement Initiative does not make use of open data

**Website:** [www.starshea.com](http://www.starshea.com)

#### Level Ground

Level Ground is a Canadian direct fair trade company that sources various food products (from coffee to dried fruit) from small producers across the developing world. In Ethiopia, Level Ground purchases coffee from the Fero Coop of the Sidama Coffee Farmers' Union for whom coffee is the primary source of income. According to the company, Fero Coop farmers receive large premiums for their coffee because it is considered among the best in the world. From a transparency standpoint, Level Ground publishes a map of the value chain for each of the products they buy as well as the purchase history and breakdown on its website.

**Impact:** The coop invests Direct Fair Trade Premiums in extra payment to farmers and capacity building.

**Use of open data:** Level Ground makes its entire purchase history available online

**Website:** <http://www.levelground.com>

### 3. What we found

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#### SourceMap

SourceMap is a platform for supply chain visibility launched by Massachusetts Institute of Technology (MIT) researchers in 2009 as a public consumer information website where conscious consumers could find out where products come from and what the social and environmental impacts are. It has since grown to become flexible and easy to use supply chain visualisation solution to automatically map supply chains from raw materials to end customers. The site was built as a social networking website and uses crowdsourcing. Companies upload a list of their direct suppliers, invite them to join the social network and ask them to map out their supply chains. This gets them visibility into the second tier of their supply chain, the third tier, and so on and so forth until their entire chain to all the sources of their raw materials has been mapped.

In its free edition the platform details the supply chain journey of some of the most frequently bought products, like BIC pens, Starbucks coffee and Colgate toothpaste. It maps both the upstream and downstream activities in the supply chain as well as the complexities present along the way.

**Impact:** SourceMap's partnership with Mars Chocolate in Côte d'Ivoire is expected to improve the supply of better planting materials, train farmers in good agricultural practices and invest in community-driven development projects for 150 000 cocoa farmers in the Soubré region by 2020.

**Use of open data:** Source Map provides free access to supply chain maps to a number of companies on its website.

**Website:** <http://www.sourcemap.com/>

In addition to project-based initiatives, this report also tried to explore other research datasets, including academic papers, which have looked at value chain transparency in the context of agriculture. Not much research was found, but the subject of the studies that were identified were often similar projects to the ones discussed here. This is understandable because most of the initiatives remain in various pilot stages, with their outcomes, impact and sustainability not having been fully studied or understood. The following three research abstracts have been selected to illustrate the kind of academic studies found on value chain transparency.

#### EXAMINING THE CAPABILITIES APPROACH THROUGH ICT4DEV PROJECTS: THE FAIR TRACING PROJECT

This research paper argues that the capabilities approach, a philosophical concept of human development conceived by economist Amartya Sen, instructs that technologies should be co-designed with the user so as to expand the freedom of the user to live the life they themselves value. The Fair Tracing Project (October 2006–September 2009), a partnership between UK researchers and local partners in Chile and India, aimed to illustrate a real-life attempt at applying the capabilities approach to an information and communication technology for development (ICT4D) action research project.

### 3. What we found

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Based on survey data, formal and informal interviews, group meetings and a design workshop with potential users, the project applied a bottom-up, participatory approach to technology design to use newly emerging and evolving technologies, such as the internet, smartphones and radio frequency identification (RFID) tags allowing superior traceability in supply chain management, to give fair trade producers (of wine in Chile and coffee in India) and consumers more information about the products that they buy.

The objective of the Fair Tracing Project was to support both producers and consumers in their decision-making in fair trade value chains by using ICT to provide them with information. Findings from the action research process show that while supermarkets are the lead firms in the fair trade value chain in terms of economic power, the producers and the fair trade certification body wield 'moral power' over other actors in the value chain. The paper argues that action research, in particular the position of the research team as a collaboration partner, can lead to a better understanding of the nature of linkages and power relations between the economic actors in value chains.

#### **UNDERSTANDING THE FOOD SUPPLY CHAIN IN SWEDEN**

The recent phenomena of eating out of the home and consuming processed foods have presented new business opportunities for food manufacturers. However, the new food products require increased quality and safety measures, and thereby a more controlled distribution. This research from Lund University seeks to explore the food supply chain from a critical-context point of view in order to highlight existing risks and traceability issues.

While the initial part of the study is based on a literature review in the area of traceability combined with a number of related search words, a number of case studies have also been carried out in order to map the food supply chains and better understand consumer standpoints in terms of how the system for distribution of food from manufacturer to end-user operates in Sweden. The paper suggests attitudinal changes towards overall supply chain responsibility, better resource utilisation and increased knowledge among actors. Furthermore it also recommends supply chain actors to better integrate consumer insights on food safety perceptions in order to create value.

#### **ANALYSIS OF AGRICULTURAL INNOVATION AND SERVICE DELIVERY WITH MOBILE PHONES IN KENYA**

Existing m-services (mobile services) in the developing world are barely scratching the surface of what is technologically possible. This PhD dissertation examines how current technology trends may impact on m-service delivery to farmers in the future. Three trends are identified: the growing diversity of mobile connected devices to access m-services; the 'internet of things', which links objects and people through the network; and the increasing ubiquity of mobile networks and expanding user base.

### 3. What we found

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The dissertation presents the case study of M-Farm, an m-service that offers price information and marketing services to Kenyan farmers. It examines how the service has impacted on farmers' decision to adopt agricultural technologies and their ability to generate income from their use. Farmers were very enthusiastic about the positive impact of M-Farm on production decisions and income, but the study finds little other evidence to support this positive perception. Other constraints, such as the risk of crop losses, lack of insurance and limited finances, were generally seen as more significant obstacles. The study also shows that the radio provides a viable alternative to disseminating price information in the early stages of production while M-Farm becomes more important closer to the selling stage.

### SUMMARY OF FINDINGS

The selected case studies and research presented above provide a snapshot of various interventions from around the world that try to address information asymmetry in agricultural value chains and/or increase transparency. The survey of the various initiatives in value chain transparency has revealed five key observations.

**1. Nearly all of initiatives were/are in various pilot stages.** Despite the relative successes observed in many of the projects presented, it is not clear whether and how they can be scaled nationally. Often the projects are spearheaded by donor financing, whose life cycle is at most two to five years. Even in cases where there is a private sector actor leading the initiative, full-scale roll-out of an ICT-led innovation for value chains requires the ICT provider to: create an ICT platform that is robust enough to support high-volume data transfer; put in place an adequate customer service team and distribution channel (i.e. human teams); convince stakeholders (especially farmers) to use and pay for the service; and negotiate with the mobile network operator to offer the application on its network. Needless to say, these things require significant resources.

**2. Value chain actors have different information needs.** When thinking about information transparency in value chains, it is important to consider that the information needs of the various value chain actors vary. What is important to the farmer may be different to what is important to the processor, which may be different to what is important to the input provider. Therefore, when we talk about improving access to information in a value chain, we also need to ask the question 'for whom?'

**3. The push towards ICTs needs to be balanced with a deeper understanding of the underlying problems.** Technology, in and of itself, is not a solution. It is only a tool. Given the issues of sustainability and cost, it is critical that organisations have a thorough grasp of the problem before prescribing the latest ICT platform to address perceived issues of information asymmetry in value chains. ICT projects are generally successful when the fixed costs can be spread across wide usage of the technology, meaning that there are many users, frequent usage and, perhaps, different types of usage. Needless to say, self-sustaining models with a clear revenue generation plan and/or financing model have a greater chance of success than those based solely on donor funding.

### 3. What we found

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**4. Very few of the initiatives observed engage government effectively.** Perhaps because innovation in the developed world generally falls in the domain of the private sector, most of the initiatives observed have duplicated a similar model in designing their programmes. In many cases, the interventions involve partnerships between a donor which funds the project; a development NGO which implements the project; a private ICT firm that provides the technology platform; and the beneficiary group, which is the target of the intervention. There is sometimes a very minor, but often unclear role, played by government.

However, unlike in the developed world, the vast majority of these initiatives take place in countries where the central government, for better or worse, plays a leading role in the agricultural sector. From policy and research to extension, there is no area where government is not an active participant. Furthermore, government agencies – such the ministry of agriculture or the national statistical agency – probably house more agriculture-related data than any other entity in a country. Therefore, any serious initiative on value chain transparency should try to engage the government more directly and prominently as this would not only be valuable for the initiative’s success, but would also be vital for its long-term sustainability.

**5. Data sharing and open data are two separate things.** There is a difference between initiatives that make more data available between selected actors in the value chain (data sharing) and initiatives that attempt to make data on a specific process in the value chain openly available to all (open data). With open data being a relatively new concept, it hasn’t thus far been a focal point within most of the initiatives observed. This is partly due to the fact that information needs in the value chain vary according to the role of the participant. With most actors in the value chain – particularly those closest to the farmer, who are often the targets of interventions, being mere users of information/data rather than aggregators and disseminators of it – opening data is really beyond their mandate, not to mention capacity. As a result, accessing and utilising the information they need, be it from open sources or simply shared within the value chain, is the overriding concern. However, actors further down the value chain, such as processors, exporters and retailers, are in a stronger position to make data open not just out of a sense of goodwill and responsibility, but rather because more and more of their customers are demanding it.

## 4. How can value chains be made more transparent?

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The real world examples presented in this report demonstrate that transparency is critical to all actors in the agricultural value chain. Organisations have tried to address this need by leveraging information and communication technology tools such as mobile phones, which in recent years have become ubiquitous in Africa. Indeed, the results are encouraging, as most of the interventions reviewed indicate positive changes with regard to productivity, income, traceability and financing. However, the study has also revealed that more needs to be done to ensure that such initiatives are sustainable beyond the pilot period. As we anticipate a future where the number of value chain transparency projects is sure to increase, it is critical for implementers to keep a few things in mind.

Donor and implementing agencies must have clear plans to ensure that the positive outcomes resulting from new initiatives can be scaled out and sustained through clear and realistic revenue models. For example, it is not unusual for farmers to sign up for an intervention while it is free, only to opt out when donor funds run out and they are asked to pay for that same service. Having a clear post-pilot financing model will alleviate such issues. At the same time, we also know that farmers are more than willing to pay for a service when it is truly beneficial to them, which raises another important point. Many initiatives fail to sufficiently consider the ultimate needs of the intended beneficiaries when designing their interventions. Therefore, to be successful, less focus should be placed on the ICT component and more emphasis on ensuring that intended beneficiaries are included in the project design processes.

Finally, if value chain transparency projects are to succeed, government must play a more prominent role in the process. From providing an enabling environment to opening up the trove of data it controls, there is a lot government could do in this regard. Ultimately, engaging government in value chain transparency would not only benefit the projects themselves, but would also go a long way towards ensuring their sustainability.

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➤ If you want to give it a try and implement the approach – with or without us – let's talk!

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