



# Feasibility of establishing a market information system in the Horn of Africa: Insights from northern Kenya

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## Context

Market information system (MIS) is a system designed to support marketing decision-making. Jobber and Fahy (2009) define it as a system in which marketing data is formally gathered, stored, analysed and distributed to stakeholders on a regular basis in accordance with their information needs. MISs were introduced in the sub-Saharan African (SSA) region in the context of structural adjustment policies<sup>1</sup> from the 1980s and 1990s. The aim of introducing the system was to overcome knowledge deficits and imperfect information, a situation created after states<sup>2</sup> withdrew from market (Goetz and Weber 1986; Manda 2009).

Research has demonstrated the potential of MISs to increase value-chain efficiency by strengthening vertical links between various actors. However, establishing a sustainable MIS, i.e. easily accessible and efficient, has been a challenge. This has been attributed to institutional-, technical and policy-related constraints. The situation is even more complex when it comes to obtaining sustainable market information from remote and difficult to access arid and semi-arid lands (ASALs), such as in northern Kenya.

Northern Kenya is predominantly occupied by pastoralists who depend on livestock as their primary assets and

sources of livelihood. They face a wide array of challenges, including climate-related risks, access to market information and limited opportunities for diversification.

Information deficiency and asymmetry has consistently crippled economic growth and household decision-making. While acknowledging the challenges faced by actors interested in the area and the potential contribution of MISs in bridging information gaps in such contexts, the International Livestock Research Institute (ILRI)—in partnership with government and donor agencies—is developing a crowdsourced-based platform<sup>3</sup> tailored for selected market information needs in northern Kenya. The system is expected to take advantage of the rapid advances and widespread use of digital technology, particularly in mobile and web applications, to collect, analyse and disseminate near real-time market information to stakeholders and facilitate household decision-making. The system is intended to reduce stakeholder market information asymmetry and transaction costs associated with collecting, storing, disseminating and validating data.

To assess the feasibility of establishing such a platform, a team of ILRI researchers conducted scoping missions to: study similar existing data collection systems; identify the sustainability constraints faced; assess the feasibility of operationalizing a crowdsourcing platform for the collection of market information; and understand the level

<sup>1</sup> Structural adjustment programs (SAP) was the name given to a set of free market economic policies designed for developing countries by the Bretton Woods institutions (the World Bank and International Monetary Fund (IMF) as a condition for the receipt of loans.

<sup>2</sup> 'State' here refers to the government; the basic aim of SAPs was to push governments from the welfare mode of providing services to more liberal, market-oriented, service provision.

<sup>3</sup> 'Crowdsourced-based platform' refers to a process whereby information is obtained on a particular, topic, service, etc. and inputted into a task or project by a large number of people, either paid or unpaid, typically via an Internet application.

of demand locally for livestock market information and other related market and non-market data. This document summarizes findings from existing literature and the scoping mission.

## Methodology

The study was conducted in the ASAL counties of Isiolo, Samburu and parts of Marsabit (see Figure 1 situated in the northern part of Kenya). The study sites were purposively selected because they have a mix of good and bad mobile network coverage, and vibrant livestock markets. Furthermore, ILRI and partner organizations have previously conducted similar missions in the area, using mobile applications to collect surveys and images of rangeland conditions in Isiolo.

Figure 1. Study sites for the scoping Missions



Two scoping missions were undertaken between April and June 2016. The first mission had a wider scope and targeted a range of stakeholders to gain insights on existing systems, their outcomes and implications, and the feasibility of improvements. Data was collected mainly through key informant interviews (KIIs) and focus group discussions (FGDs). A total of 16 KIIs were conducted with government officials, local non governmental organizations (NGOs), veterinary service providers, commercial insurance agents, traders, brokers, livestock keepers, mobile phone sellers and fodder-production group leaders. Four FGDs were conducted with groups of pastoralists in Kinna and Oldonyiro locations. The respondents were asked to give details about their information needs, channels through which they receive information, existing information dissemination structures, the type and use of mobile phones owned and their thoughts about the use of information and communication technologies (ICT) in collecting and disseminating information. The insights generated from the first mission provided further evidence in support of investing in a crowdsourced-based digital platform as the basis of a sustainable MIS. The information collected was used to develop a paper version of the functionality of the envisioned crowdsourcing platform, in the form of a

skeleton system design and the range of potential questions underlying a pilot system. The details and the strategy for crowdsourcing livestock market information was developed and put together in a codebook<sup>4</sup>.

In the second scoping mission, the researchers triangulated the information collected in mission one, tested the basic concept with stakeholders, and sourced information to establish the parameters for system design and piloting. A follow-up visit to a number of government and NGO offices was conducted. At the same time, nine different markets within Isiolo and Samburu counties were visited. These included the Kipsing, Oldonyiro, Merti, Isiolo central, Korr, Lolkuniyani, Kimanju and Merille markets. KIIs were undertaken with the sellers, buyers and brokers of livestock and other food commodities within the markets. The main components of information collected were the: price of livestock and food commodities; number of livestock and traders in the market; and market operation status. The findings were used to update the codebook, which was the key document used to engage the software developers leading up the design of the system.

## Findings and discussion

### *Existing channels of information collection and dissemination*

The main channels of information in the community are word of mouth, radio and mobile phone. Approximately 90% of the FGD participants confirmed that their community trusts information delivered through word of mouth by neighbours, relatives and institutions<sup>5</sup>. This channel has been traditionally trusted to deliver reliable information regarding the welfare of friends and family, market trends, security, early warnings and general community status. However, delayed delivery is the major setback of this system. Radios and mobile phones (phone calls and SMSs) are also used in the area. Most respondents confirmed that they had a basic phone, feature phone or a smart phone.

In terms of data collection and dissemination, researchers found that both public-sector and NGO actors periodically collected information at household and market levels. For instance, the National Drought Management Authority, county government, REGAL AG<sup>6</sup> and Action Aid collect information regarding disease outbreaks, security-related issues, food-security status, water and pasture points, livestock prices, livestock volumes traded in markets, and the number of traders visiting markets. This information is primarily used to make service provision decisions, and monitor and evaluate development projects. Information on livestock markets has also enabled the county government in improving the efficiency of the revenue

4 Codebook here refers to a manual detailing the process of the system development, and describing the system component. This has been used as a guide for the developers to design the Livestock Market Information System.

5 Institutions are defined as formal or informal entities which could be in the form of community-set norms, culture or traditions which a group usually follows.

6 Resilience and Economic Growth in the Arid Lands—Accelerated Growth (see <http://www.acdivoca.org/projects/resilience-and-economic-growth-in-the-arid-lands-accelerated-growth-regal-ag>)

collection process and in developing market infrastructure. This data is manually collected by agents located at various focal points. However, due to the wide spatial distribution of populations and poor infrastructure, data collection is: costly and inefficient; plagued with quality concerns; and typically not used beyond the specific program which collected it.

These organizations disseminate various kinds of information to county residents; for instance, the National Drought Management Authority, in collaboration with partner institutions, periodically sends out early-warning information. This information is critical in ensuring the impact of drought can be mitigated in an efficient and timely manner. Dissemination is undertaken using colour coded flags and drought bulletins, which are placed in major institutions, such as schools and local administration offices. School children ('drought ambassadors') and area chiefs are trained in interpreting the colour codes for local residents. However, the FGD participants indicated that there were delays in the delivery of early-warning drought information, and inconsistencies in the information provided—making it unreliable for household decision-making.

### *Feasibility of establishing a market information system*

#### **Infrastructure and ICT policy framework**

Physical infrastructure in northern Kenya has significantly improved over time. Traditionally, it was among the least developed areas in the country; however, in the past 10 years, the national and county governments have made deliberate efforts to improve general service delivery. The national government, with the support of development partners, has invested millions of Kenyan shillings establishing road infrastructure linking Kenya and Ethiopia. In addition, both local and international development agencies, in collaboration with the government, have supported the construction of modern market structures within the region. However, much remains to be done to catch up with the rest of the country.

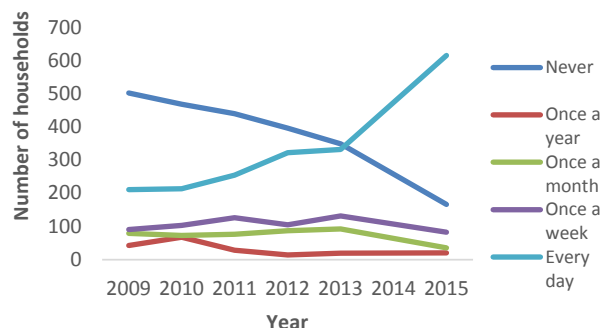
The county government of Isiolo has laid out an ICT 'roadmap' expected to catalyse the use of technology as a means of accelerating economic growth. It recognizes role of ICTs in: reducing transaction costs; increasing business efficiency; improving education standards; raising the competitiveness of local businesses; and improving accountability and productivity of the county's departments. This roadmap provides the impetus for ICT-based innovative technologies in Isiolo.

#### **Mobile phone use**

FGD participants confirmed that they widely use mobile phones for communication, mobile money transfers and banking, and social media. They also confirmed that the penetration of feature and smart phones has been high. Indeed, data from the Index Based Livestock Insurance project (IBLI)<sup>7</sup> shows that the frequency of mobile phone

use by households in northern Kenya has significantly increased over the past six years (Figure 1). Also, according to Communications Authority of Kenya statistics, the country has one of the highest rates of mobile penetration in the world, which stands at 88%—compared to a world average of 51% for the past 10 years<sup>8</sup>. Northern Kenya has mirrored these advances in mobile phone use.

Figure 2. Phone use frequency in northern Kenya



Some development agencies in the area have already begun to tap into these advances in information technology. For instance, Action Aid has previously used phones to collect data—the information is sent in the form of an SMS to a central hub and disseminated via different mechanisms. Other organizations, SNV Netherlands Development Organisation<sup>9</sup> and Kenya Livestock Marketing Council, have previously tried web- and phone-based data collection methods; however, these platforms have faced sustainability related-obstacles due to technical and ownership challenges and can be improved.

#### **Demand for a market information system**

Both public and private sector respondents share the vision of a reliable MIS platform that could reduce transaction costs and improve the efficiency of information collection and dissemination. For instance, the county government and the National Drought Management Authority expressed interest in a platform that could enable them to improve their efficiency and timeliness in data collection, management, analysis and dissemination. Respondents said this would be of particular use for topics such as early warning information, disease surveillance and general security. Accurate market data could increase the efficiency and amount of revenue collected in the county, resulting in increased economic development.

## **Conclusion**

The study found that the collection and dissemination of data, while widespread, is currently suboptimal. Data collection efforts are not coordinated and there are numerous overlaps, with no clear management and dissemination strategy. At the same time, the transaction costs of data collection are high due to the many technical

below a certain threshold. The payouts are intended to help pastoralists gain access services, such as water, fodder and medicines, to enable them to keep their animals alive during stressful conditions.

<sup>8</sup> KNBS, Quarterly Report 2015/2016

<sup>9</sup> <http://www.snv.org/about-us/organisation>

<sup>7</sup> An ILRI project, started in 2008, that provides insurance against severe droughts to pastoralists, who receive payouts when the forage conditions fall



and infrastructural challenges. This leads to an unnecessary information asymmetry along the value chain, uninformed household decision-making, and poor service delivery—subsequently dampening household welfare and economic development in northern Kenya.

Demand for coordinated, real-time data collection and dissemination exists, as does a supportive ICT policy framework and improved infrastructure, all of which support the establishment of a crowd-sourced digital MIS that is sustainable and scalable. Development of such an MIS can also piggyback on existing mobile data collection systems and traditional information dissemination methods—enabling pastoralists and their service providers to access more and better information to improve livelihoods.

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