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Livestock traceability system for domestic and export markets in pastoral areas of East Africa: An outline of the traceability database

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Citation

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Contents

Acknowledgements

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Background

This livestock identification and traceability project is being implemented under a partnership research agreement between the International Livestock Research Institute (ILRI) and the African Union – Interafrican Bureau for Animal Resources. It is one of the activities supported by the Standard Methods and Procedures in Animal Health project funded by the United States Agency for International Development. One of the planned outputs of the project is a traceability database that can be used to demonstrate the feasibility of traceability systems in the local and international markets in the region. This report outlines the structure and content of the database that was developed and used in a pilot study implemented in parts of northern Tanzania and southwestern Kenya in the last quarter of 2014. The methodology section also gives general information on the study area and the identification methods used.

Methodology

Study area

Figure 1 shows a map of the study area and the trade routes involved in the study. Some of the supply chains terminate in the Dagoretti slaughterhouses in Nairobi although most serve local slaughterhouses in Ewaso Ng'iro, which also supplies large quantities of beef to Nairobi. These chains were purposively selected in a stakeholder workshop that preceded the pilot study since they represented the busiest supply chains in the region.

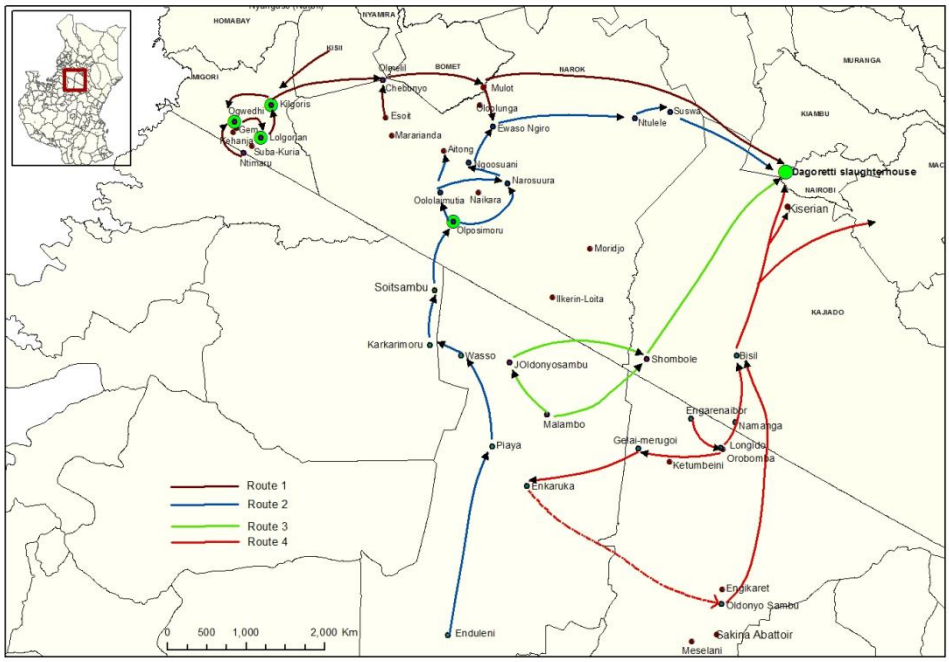

Figure 1: Map of the livestock identification and traceability pilot study area in northern Tanzania-southwestern Kenya showing the market chains selected for the study.

Animal identification methods

The pilot study was implemented along the market chains up to the slaughterhouses in Narok and Nairobi but the traceability system could get back to the production units, depending on the accuracy of the information collected at the primary markets. Animals were identified at the primary markets using three identification methods: plain ear tags, back tags and paint. However, paint was not preferred by the traders because they felt that it interfered with their system of identifying animals that had been purchased or sold. Back tags had pre-coded numbers whereas the plain ear tags used a numbering system which consisted of a letter indicating the country of origin (*K* for Kenya and *T* for Tanzania), three letters that represented the administrative region where the animal came from (NRK for Narok and NGR for Ngorongoro District) and a four-digit serial number.

Data capture system

Data on animal locations and movements along the selected market chains were collected by enumerators using the Open Data Kit Collect Android application (https://opendatakit.org/use/collect) which ran on smart phones. The data collected were submitted to an online database (http://azizi.ilri.cgiar.org/aggregate) where they were collated and interlinked based on the animal identification. The online database is hosted on ILRI's research computing cluster. The different types of data collected are listed in Table 1 and a screenshot shown in Photo 1.

Table 1: Data collected at the markets used in the pilot study in northern Tanzania and southwestern Kenya

Subject	Characteristics
Market	Name GPS location
Animal	Identification number and method (ear tag, back tag, paint) used Source (farm or another market) Next destination (market, back to farm, slaughter) Sex Colour Age category Entering or exiting the market
Owner (producer or trader)	Name Telephone contact Specify if entry or exit or stock check
Slaughterhouse	Traders details (name and phone contacts) Animal ID Immediate source of the animal being presented Inspection result in summary
Laboratory	Specify if sample is taken (barcode id of the sample linked to the animal ID) Sample identification number Tests done (antibiotic residue; brucellosis)

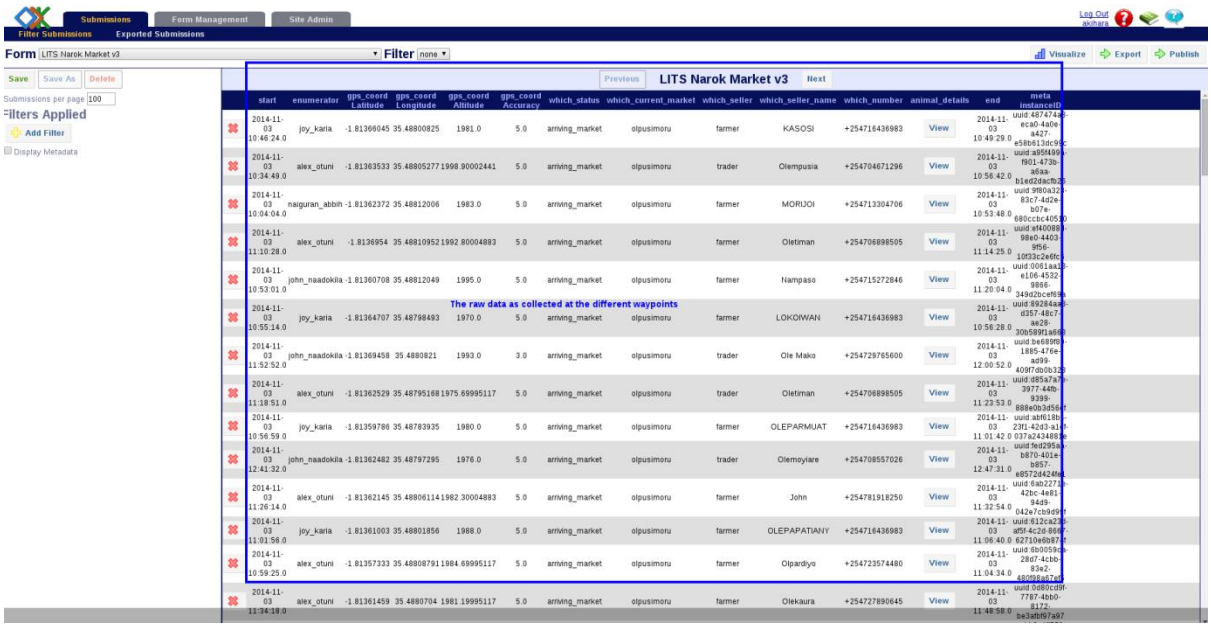

Photo 1: Screenshot of raw data as submitted to the online database from the mobile data collection points.

The database

A relational database was designed to store the data which were collected and automatically submitted from the field. The database includes a visualization module that makes it possible to track and view the animal movements from the markets to the slaughterhouses. This module can be accessed freely from http://azizi.ilri.org/modules/mod_lits.php. Photo 2 shows a screenshot captured from the visualization module.

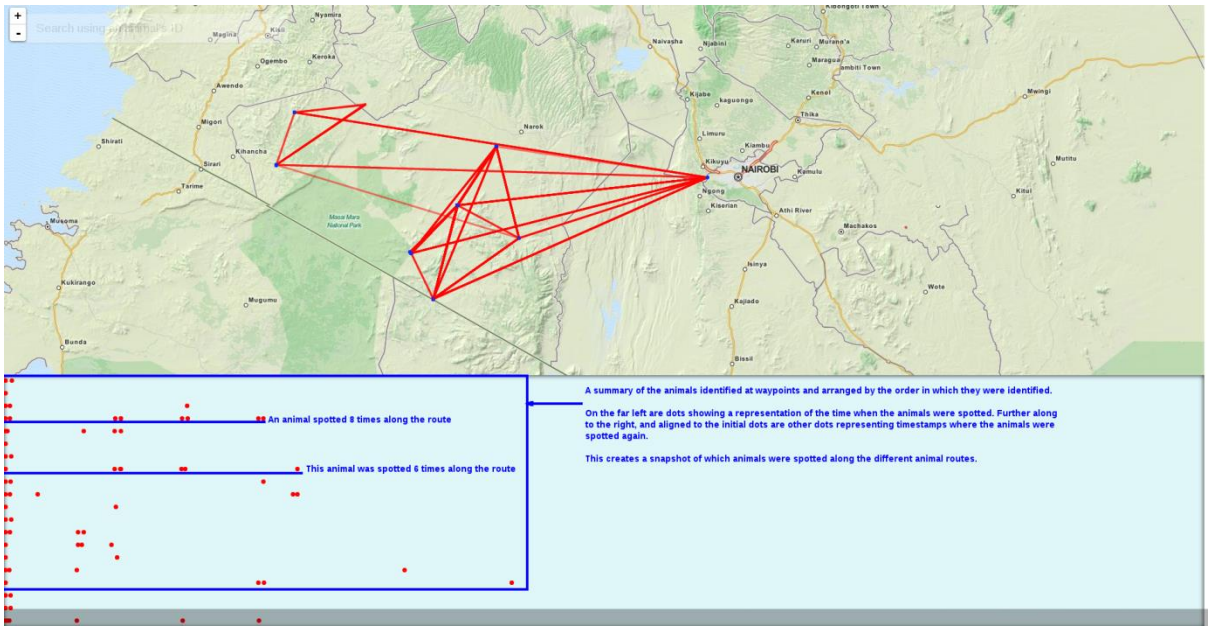

Photo 2: A screenshot showing how animals were tracked along the trade routes.

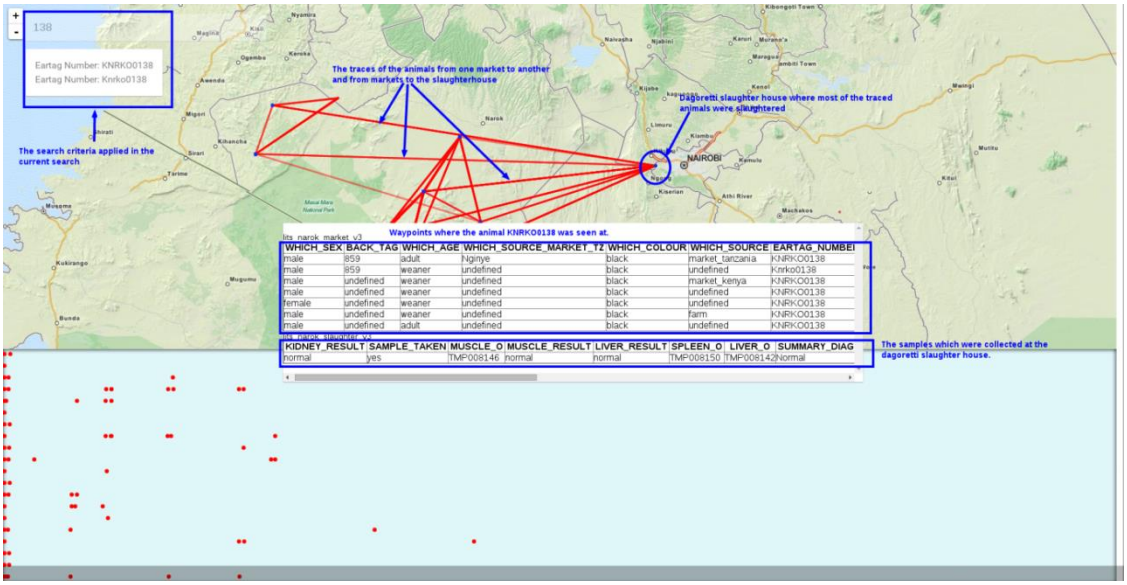

Photo 3: A screenshot showing the different parts of the livestock identification and traceability system visualization module.

Applications of the database

The data have been analysed to show the frequency of live animal movements between markets as illustrated in Table 1 and Photos 1, 2 and 3. The database has 1700 records; over 800 animals were tagged within Narok (records from Tanzania are still being cleaned). This implies that, on average, there are two records per animal representing entry and exit entries made in the markets. From this number, only 146 were recaptured in two slaughterhouses (Ewaso Ng'iro, 73% and Dagoretti, 27%) which had been included in the surveillance. The recapture rates are, however, low (less than 20%) and there is need for enactment or enforcement of policies to enhance increased uptake and coverage. The current database is therefore being prepared for use in stakeholder sensitization workshops involving decision-makers and targeted value chain actors as an initial step to improve knowledge on livestock identification and traceability capabilities.