What is your idea?

In 2014 HealthMap used social media data to detect the outbreak of Ebola 9 days before the WHO's first reported case. We believe we can do the same for livestock disease and productivity issues in sub-Saharan Africa.

The largest farming Facebook groups are all located in sub-Saharan Africa and the combined membership of the top four groups spans 100,000s of individuals. Inside these groups we find 10,000s of historical posts on the topic of dairy farming & livestock. These posts often contain detailed reports of livestock disease as well as queries and comments about productivity and management concerns but as yet they remain unanalyzed.

In 2017 ILRI launched Community Disease Reporting (CDR): a programme training animal health attendants to report livestock disease in their communities via their mobile phones. Focused on Northern Kenya, this system provides ILRI with real-time livestock disease updates in lower-income, rural areas. ILRI is also engaged with 1,000s of livestock farming households and has 100s of enumerators on the ground embedded within communities. Farmers and enumerators are communicating health and productivity data via mobile systems.

We propose to combine social media data with ILRI data to create an open-source platform to analyze and visualize emerging livestock disease outbreaks and related issues in Kenya. Farm.ink currently broadcasts messages to thousands of farmers, including many livestock farmers, through its chatbot product. Information could be seamlessly integrated into this service to warn farmers of outbreaks, advise on management and empower them with the information they need to protect their livestock.

How will you pilot it?

Over the last two years Farm.ink has designed and built software tools to mine and analyze social farming feeds using some of the latest techniques in natural language processing and textual analysis. Combining this technology with ILRI's agronomic expertise, we propose to build an online system that identifies key livestock diseases in real-time and visualizes this data in an online monitoring dashboard.

The Farm.ink chatbot was designed in partnership with IDEO.org and uses human centered design to create a rich and highly intuitive platform for farmers to seek and share information. The chatbot is built on the Facebook Messenger platform and sends a tailored daily feed of farming news to users. Combining information from the dashboard with ILRI's expertise, we propose to add disease and other alerts to this daily digest service. With over 40% of livestock bot users engaging with the service every day, we believe this could be a very strong channel to broadcast disease information.

We believe in rapidly prototyping solutions. By building on Farm.ink's existing analytical tools and data assets a first version of the dashboard could be built and implemented as early as January 2018. We

will allocate $25,000 USD to build the dashboard and create a cleaned, open dataset of social media dairy posts. This includes time from Farm.ink developers and data scientists as well as support from ILRI experts plus associated tech costs (e.g. server, hosting). This includes hosting in-depth workshops between the Farm.ink and ILRI teams in Kenya to develop the prototype dashboard.

During the first quarter of 2018 we propose to pilot the alerts service with approximately 2,000 livestock farmers who are currently using the Farm.ink bot. The pilot would allow us to test and iterate the design of message alerts to ensure farmers are getting advice that is understandable and actionable. As information on social media channels can be prone to inaccuracies and misdiagnoses the pilot would also allow us to test techniques to verify this information such as follow-up surveys through the chatbot. We will allocate $15,000 USD for Farm.ink user testing time and ILRI expert time. This would include getting detailed qualitative feedback from livestock farmers in Kenya on the alerts.

We propose to spend the following six months growing the size of the public dataset and audience of farmers who can access the alert and information system. We estimate that $45,000 would enable us to target and enroll 45,000 extra users to the alerts system while substantially increasing the size of the public dataset.

To ensure that data is open access we will host all raw data on the online platform. This raw data will include all mined social media data (post url, post images, username) plus location (where available), disease name and timestamp. The data will also include all ILRI disease reporting data tagged by location, disease name and timestamp. All code for the dashboard analysis and visualization will be hosted in public GitHub repositories. Good quality documentation is essential to ensuring that data is usable and software is replicable. For this reason we will allocate a budget of $15,000 to cover developer time to create detailed documentation and to make relevant stakeholders aware of the open data and code repositories available.

Once the project is completed the platform will be maintained and run by Farm.ink. Farm.ink also builds chatbots for commercial clients in the agricultural sector which ensures a sustainable model for further growth. By including disease alerts as a free feature to all chatbot users we would hope to see a steady increase in audience and growth of the public dataset of social media posts pertaining to dairy farming in Kenya. Assuming that measurable impact is seen in the monitoring and prevention of disease, Farm.ink would aim to replicate this service across markets and value chains.

The most common disease reported by farmers on social media channels is ECF: estimated to cause the death of over 1 million cattle annually in Kenya and losses of over $150 million USD. A dairy farmer named Michael recently posted in an active Dairy farming Facebook group that most farmers are *"ill advised, ill equipped and thus ill prepared to combat, control and prevent this disease".* Using some of the latest advancements in data science we believe we can build a cutting-edge tool to tackle this problem head on.