Leveraging Crowdsourcing and Mobile Technology: Data Collection Platform for Livestock Value Chain - KAZNET

Index Based Livestock Insurance (IBLI) team, International livestock Research Institute (ILRI)

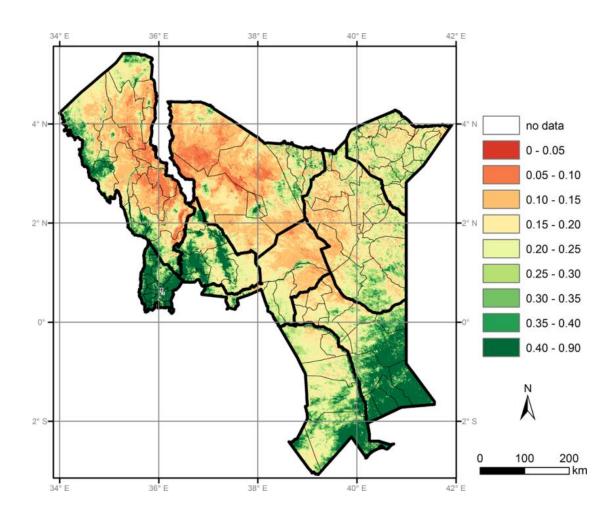




Data Science Africa 2017 at NM-AIST, Arusha, Tanzania 21st July 2017

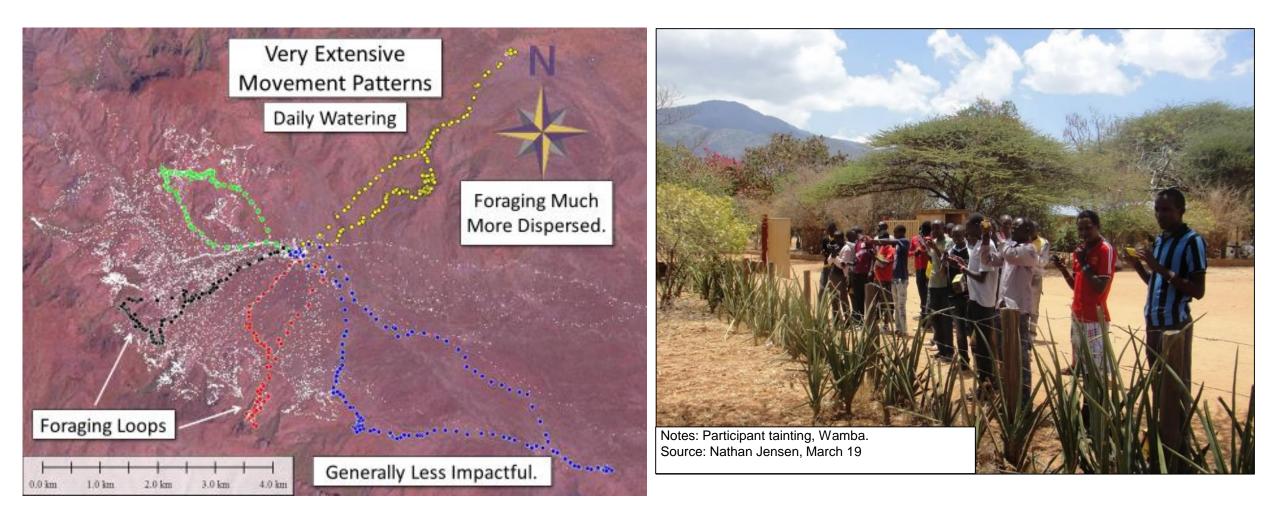


Index Based Livestock Insurance (IBLI) in Northern Kenya and Southern Ethiopia





Herd Migration Study with GPS collar and Crowdsourcing and Rangeland Condition



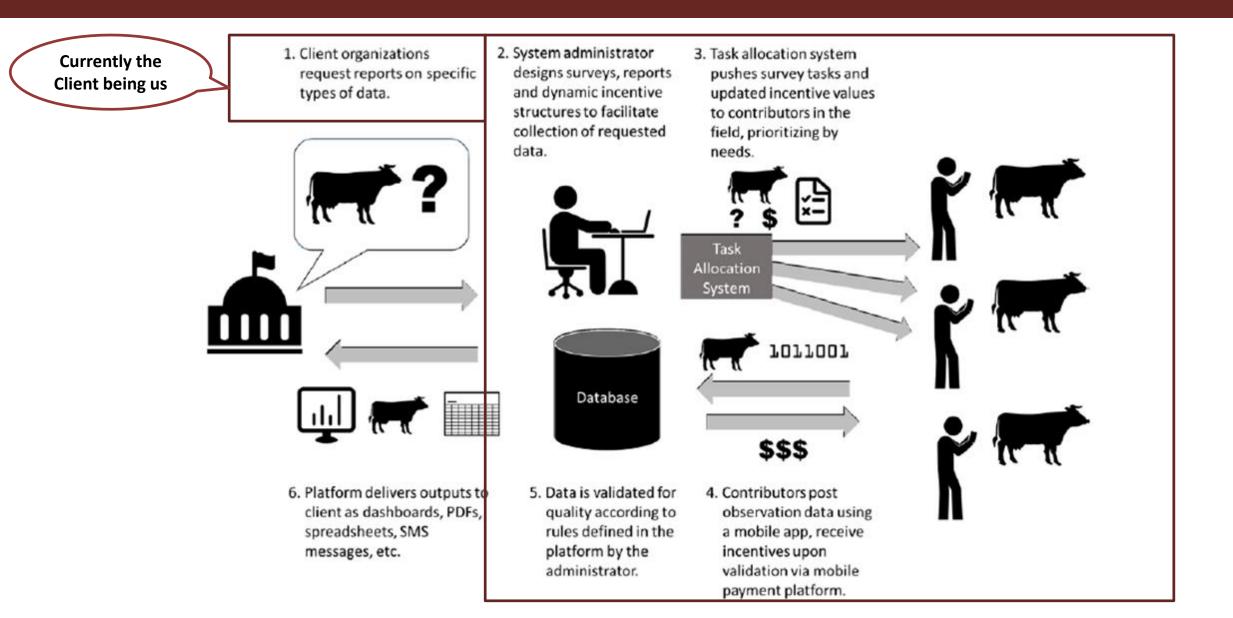
Context

- Information scarcity is severely limiting development and resource management in the drylands
- Lack of credible information has constrained governments and the development sector to provide appropriate support to the livestock sector
- Several attempts to collect market information by conventional method with trained enumerators have faced challenges with data quality and sustainability (Tollens 2006, Weber *et al.* 2005)

What are we proposing

- Crowdsourcing approach (Jensen *et al.* 2016a, b)
 - instead of traditional trained full-time enumerators
- Leverage mobile technologies
- =>
- Low-cost
- Rapid
- Quality?

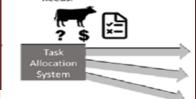
System Schema



Phase 1: proof of concept

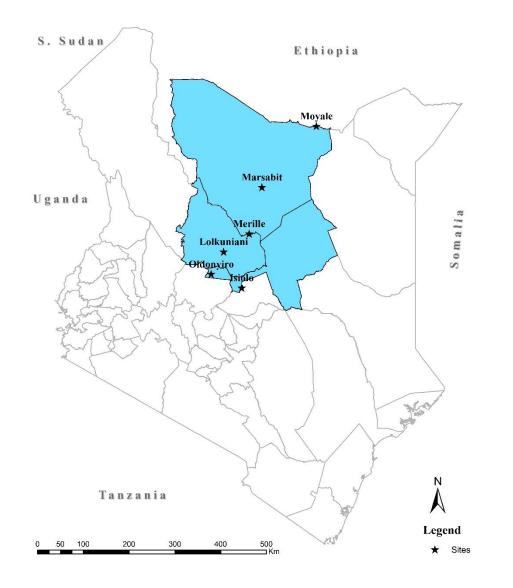
- A scoping study in April 2016
- Develop a prototype
 - Test paper version in September 2016
 - Start working with a software developer from September 2016
- Test the prototype (pilot) from late May 2017
 - □ In a small number of markets
 - On a small number of variables
 - □ For a short time period
- Study quality of collected data
- Document what we learned from all of the above

Tasks (variables, data points) for the pilot



Section	Task/Sub-section	Reward per task submission (USD)	Task submission target per week
Livestock Market Operation Status	Livestock Market Operation Status	0.29	1
	Seller's Perspective of Market Performance	0.14	. 4
	Buyer's Perspective of Market Performance	0.14	. 4
Livestock Prices and Quality	Livestock Prices and Quality	0.29	34
Volume of livestock trade	Volume of Cattle by Headcount	0.96	1
	Volume of Livestock Trade (According to Country Clerk)	0.67	1
	Volume of Shoats (Accrdiong to LMA staff or lorry workers)	0.67	1
	Volume of Camels by Headcount	0.87	1
	Number of Livestock Traders at Market	0.96	1
	Number of Lorries at Market	0.48	1
Unprocessed Milk Prices	Unprocessed Milk Prices	0.14	. 15
Other Food Commodity Prices	Other Food Commodity Prices	0.14	50

KAZNET Pilot – Sites



Livestock market task submission on market day

- Isiolo Monday
- Moyale Monday
- Oldonyiro Tuesday
- Marsabit Wednesday
- Lolkuniani Thursday

Merille - Thursday
Milk and other goods task
submission on week days

KAZNET – Front End



- 02	🖻 🛛 岩 🎢 56% 🖬 1:10 PM				
← Tasks	FILTER \Xi				
Livestock Market Ope	eration Status				
Isiolo Shoat Market	Ksh 0.0 - 30.0 + Bonus rewards				
☆	Task available				
Livestock Prices and	Quality				
Isiolo Shoat Market	Ksh 0.0 - 30.0				
☆	Task available				
Volume of Cattle by Headcount					
Isiolo Shoat Market	Ksh 0.0 - 100.0				
☆	Task available				
Seller's Perspective of Market Performance					
Isiolo Shoat Market	Ksh 0.0 - 15.0				

Image: Somali Image: Somali

BACK NEXT

0	🖻 🛛 🕏 🎾 55% 🖬 1:12 PM			
Livestock Prices and Quality				
What is the sex of t Male	he animal?			
What is the age gro Young	oup of the animal?			
(Click the link below	al condition of the animal? v to read an explanation of ns before answering)			
(Click the link below the response option Fat	v to read an explanation of			
(Click the link below the response option Fat What is the price of	v to read an explanation of ns before answering)			

KAZNET – Backend for Data Validation

Database

Logo					
Logo		Take a photo of the animal.			
L Users ❤	Tasks	Submitted at: 2017-07-04 06:34:08 and Location 0.612868, 36.9583978			
🔚 Tasks 💙					
Manage Task Lists					
Validate Submissions	Search			Select Action \$	Apply Test
Payments	Date	N N M			Status
∎ Dashboards and Reports ❤	2017 07:2		arket atus	View Details	Flag: Input Validation
♣ Notifications ♥	2017 06:3		arket atus	View Details	Flag: Input Validation
	2017 09:4		arket :atus	View Details	Flag: Input Validation
	2017 06:2	A - A - A - Com	arket :atus	View Details	Flag: Input Validation
	2017 06:2		arket :atus	View Details	Flag: Input Validation
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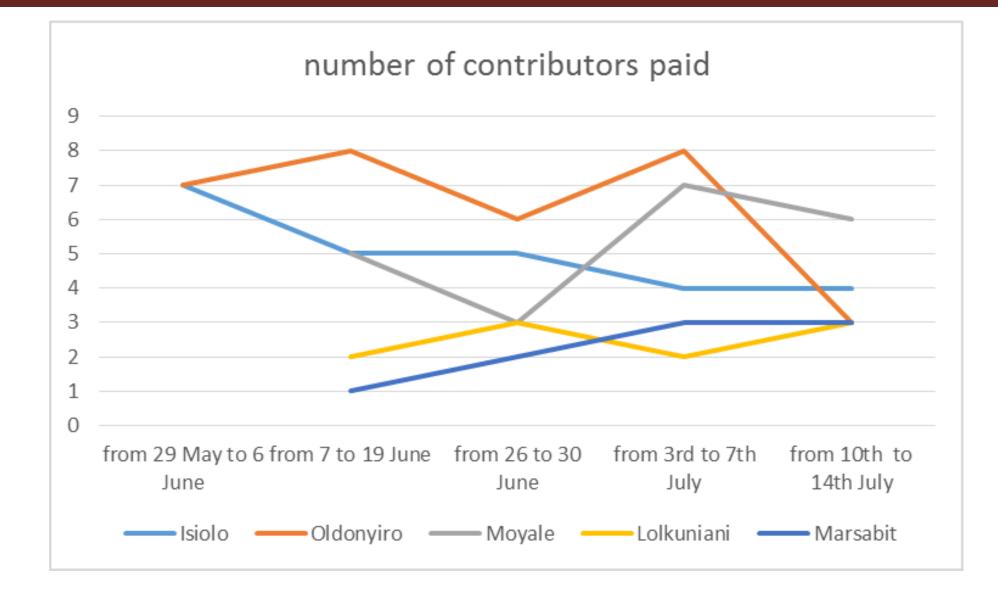
Pilot so far

- Pilot launched at 29th May in Isiolo and rolleded out to other 5 markets each by each
- □ As of 14th July
 - □ 5,632 task submissions were submitted
 - □ 4,794 task submissions were accepted and
 - □ reward of 1,224 USD were paid and to be paid
- 32 potential contributors were trained and 21 contributors are still active
- We gave up Merille market at least for this pilot on 17th June since our software could not submit a task due to weak mobile network and lack of software functionality for overcoming it

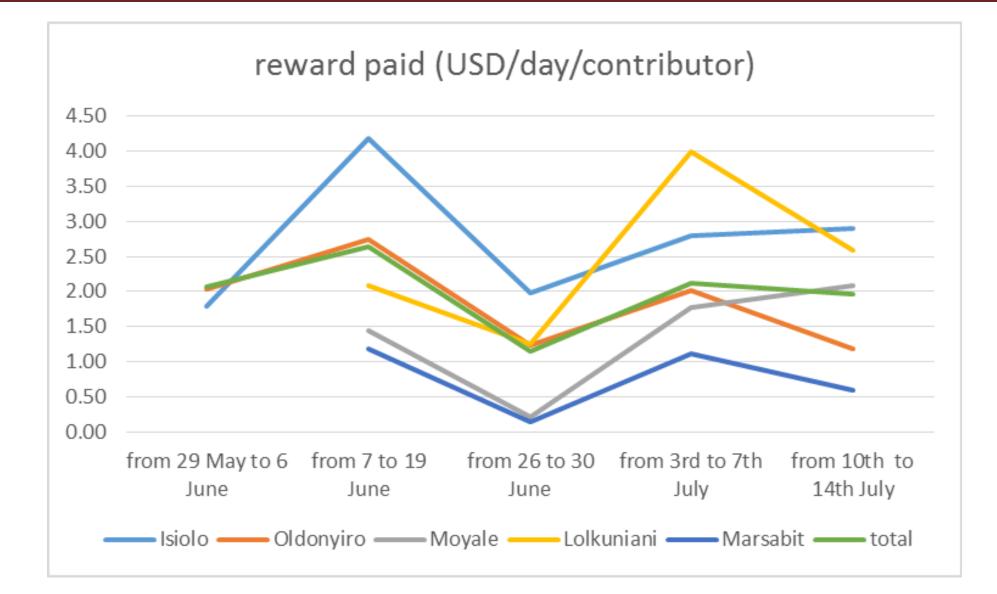




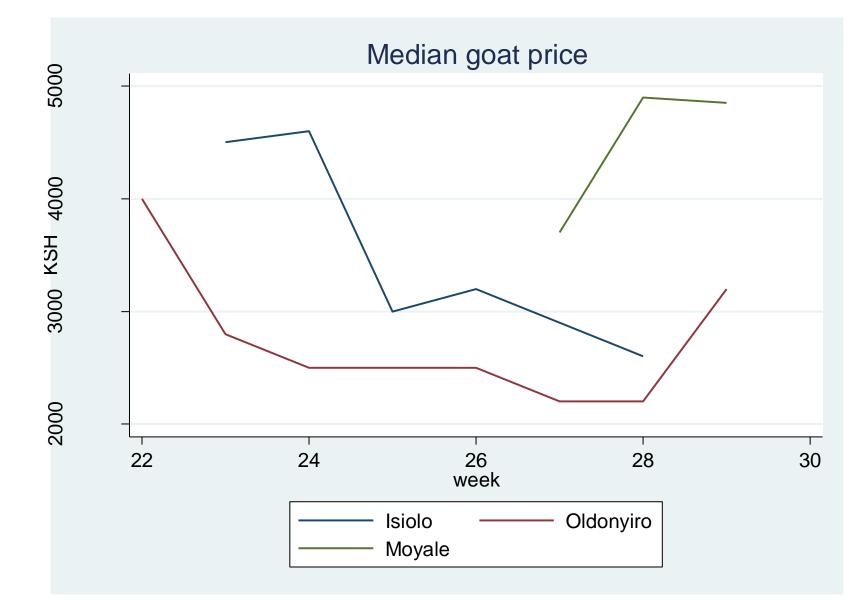
Pilot so far (cont.)



Pilot so far (cont.)



Goat price: Moyale > Isiolo > Oldonyiro



Fat goats are more expensive than moderate goats



Challenges

Difficulty in managing software development

- Found errors and specification not fit for the purpose even in the pilot
 - Phone application for contributors
 - » Frustrate contributors
 - » Difficult to train contributor remotely through phone and whatsapp
 - » Need to visit contributors (2 staff * 3 times, 6 staff * 1 time)
 - » Giving up contributors who were willing to participate
 - Merille due to poor mobile network and lack of software functionality overcoming it
 - Contributors having old or/and weak smartphones (software seems to need 1GB RAM)

Challenges (cont.)

Difficulty in managing software development (cont.)

- Found errors and specification not fit for the purpose even in the pilot (cont.)
 - Web interface for administrator
 - » Need image recognition and validation function in the future
 - » Validation rules are not enough
 - Need to reject task submissions by stata even for simple validation rules (submission days and target number of task submission per day)
 - » Reward calculation
 - Need to calculate reward by stata instead of using reward export function

Challenges (cont.)

□ Reluctance to respond to contributors

- Should have engaged stakeholders in markets more in advance
 - Asked livestock market association (LMA) and livestock market committee (LMC) to introduce contributors to market participants
 - Provided T-shirts and hats to contributors
- Some of submitted pictures are not visible or useful for validation
 - Need to develop and provide more clear guideline and training to contributors

Way Forward

- Wrap up the pilot
 - Analyse data quality
 - Document lessons learned
- Improve prototype

Way Forward (cont.)

- Need to develop more clear guideline and more training to contributors
 - contents
 - How to approach respondents
 - How to take pictures
 - How to obtain data efficiently and accurately, especially, number of animals and animal body condition
 - media
 - Training manual
 - face to face training
 - Mobile training, mobile support,

Research Questions

□ In phase 2, we would like to study data collection:

□ How can we most cost effective improve data quality?

- Cross-validation among many data points
- Image recognition
- Supervisor spot checks
- Rewarding consistently high quality submissions
- □ What degree of confidence can we have in our data?

□ In phase 3, we would like to study

- data dissemination and
- business strategy and sustainability for the whole system



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