Earth observation applications in Index-based Livestock Insurance (IBLI): challenges and opportunities

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ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR

PROBLEM & RATIONALE

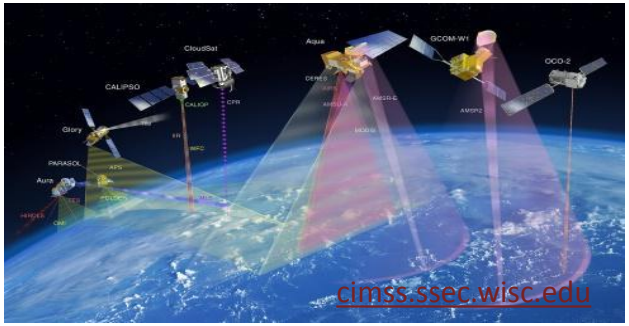
Pastoral populations of Sub-Saharan Africa are particularly vulnerable to environmental shocks, particularly drought, which contribute to livestock mortality and therefore losses in both wealth and productive assets.

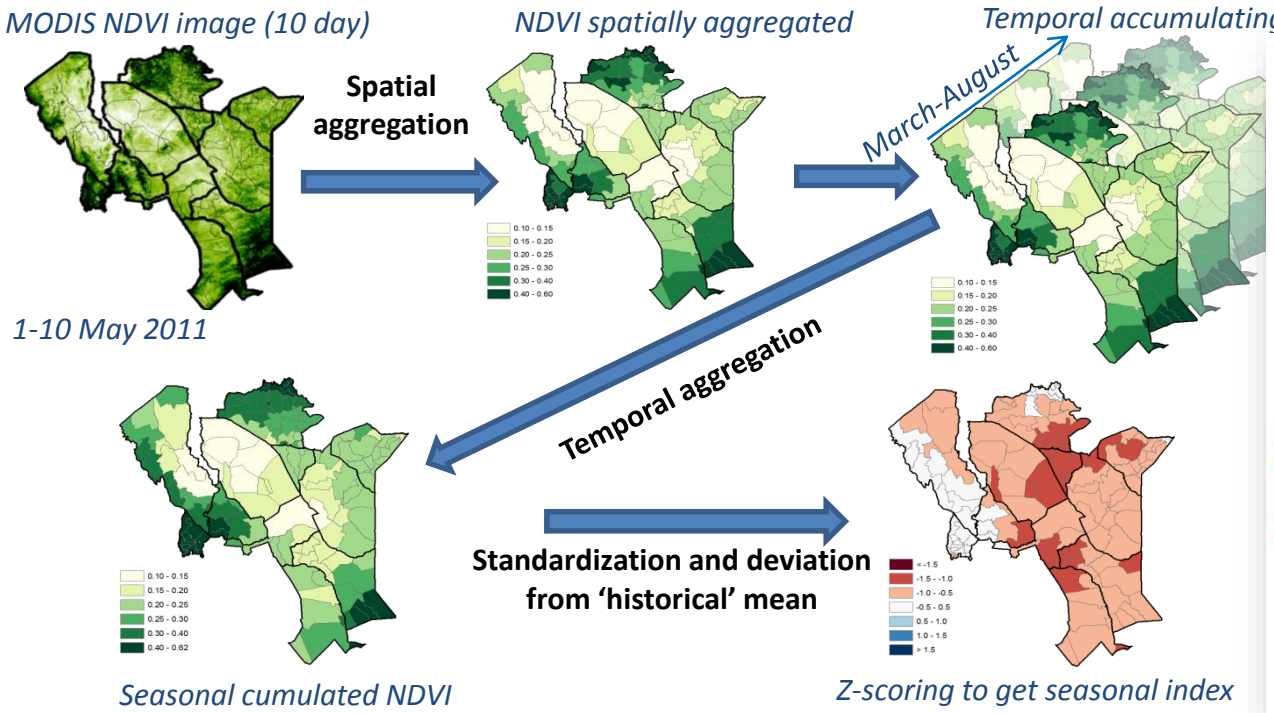
Can we develop a sustainable risk reduction approach using innovative technologies?

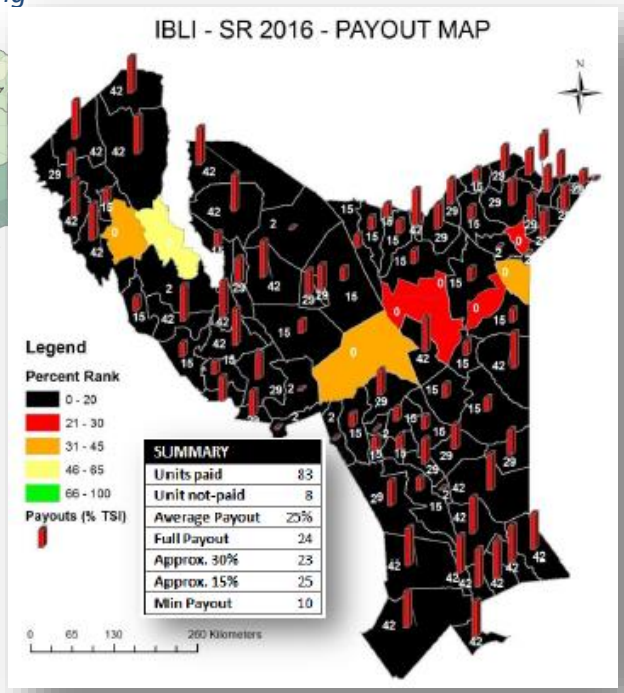
- Index-based Livestock Insurance (IBLI) an innovation in insurance design suitable for pastoral areas in Africa.
- EO-based forage availability/scarcity assessment to design precise and cheap asset protection insurance contracts.
- First launched in Marsabit in January 2010.
  Now scaled to Ethiopia and across Northern Kenya with increasing commitment of commercial entities, government and development partners.

HOW IBLI WORKS

- Satellite based (MODIS) Rangeland mapping & monitoring
- Early detection of forage availability
- Payouts in case of drought related forage scarcity







Vrieling et al., 2014,2016

IBLI COMPONENTS

Components of a sustainable Index Insurance Program

1. **Index design:** Data demands (long term series, reliable, non-manipulable). Index precision (minimizing "basis risk", maximizing value). Contract design – matching index to risk profile.

2. **Establish informed effective demand**, especially among a clientele with little experience with any insurance, but even for meso and macro actors. Extension, capacity development, marketing.

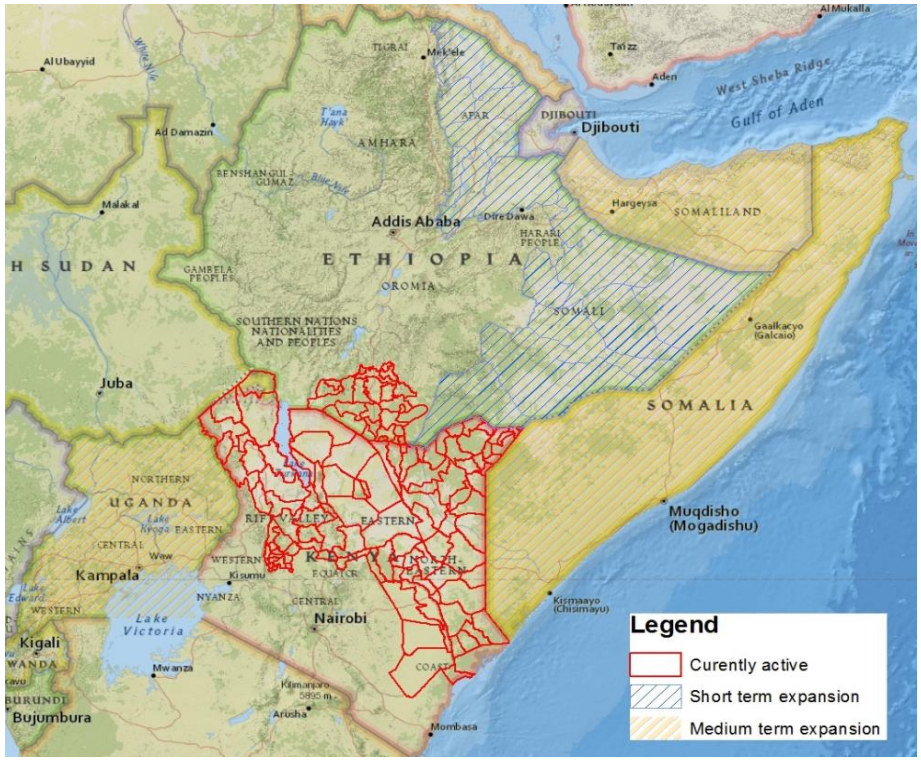
3. **Low cost, efficient, delivery mechanisms (supply chain),** to build critical mass of clients/recipients. Sales transactions platforms, information and extension, indemnity payments

4. **Policy and institutional infrastructure.** Regulations, oversight, effective coordination of public and private sector roles

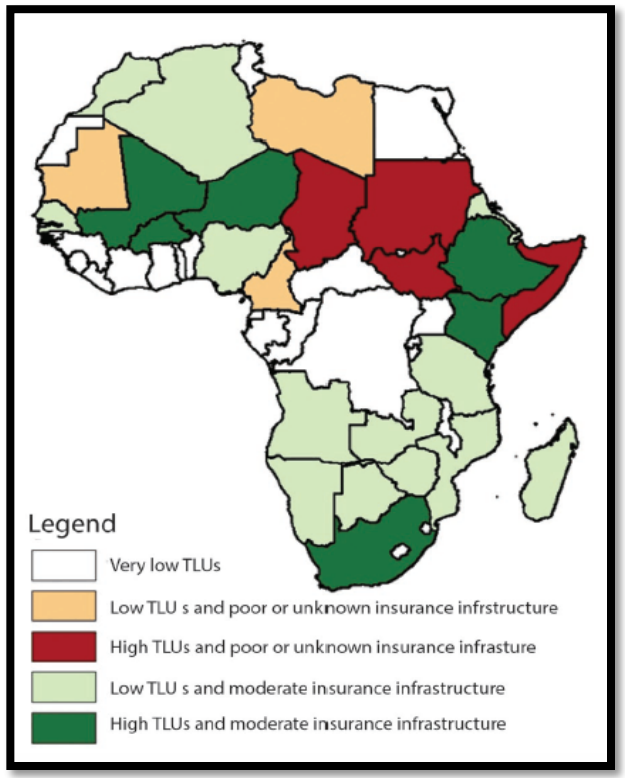
IBLI ACHIEVEMENTS

- About 20000 contracts sold (Kenya and Ethiopia, private and public)
- Positive impacts on household welfare and health indicators
- Demand for expansion from several countries
- Recent big payouts. Over 2M USD to 17000 households.

IBLI area of operation

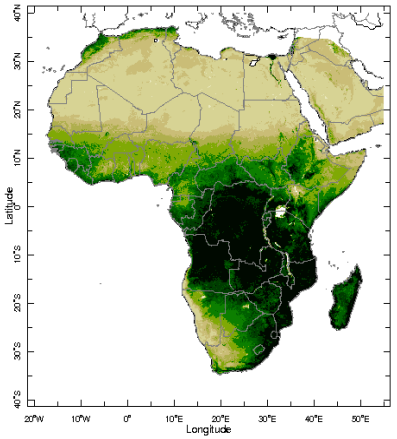


IBLI potential expansion



GAPS & OPPORTUNITIES

EARTH OBSERVATION AND RANGELANDS

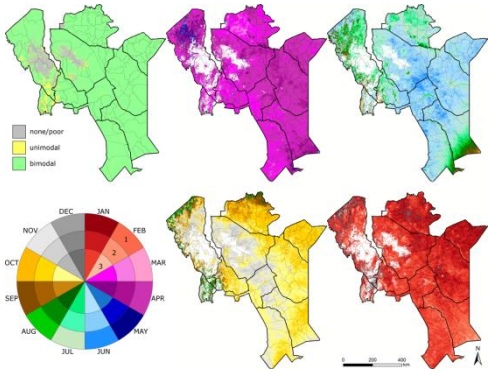


- ❑ NDVI limitations as a forage availability index.

Can we use new/multiple indicators (e.g soil moisture, RFE, Sentinel)?

- ❑ Poor characterization of rangeland systems (e.g. in relation to palatability and land condition)

Multi-scale mapping (drones/very high res. satellites).



- ❑ Poor link between vegetation and livestock production.

Livestock detection, grazing patterns, water points mapping.

- ❑ Lack of long term data for “validation” of mapping products.

Crowdsourcing, ground networks (webcams), drones.

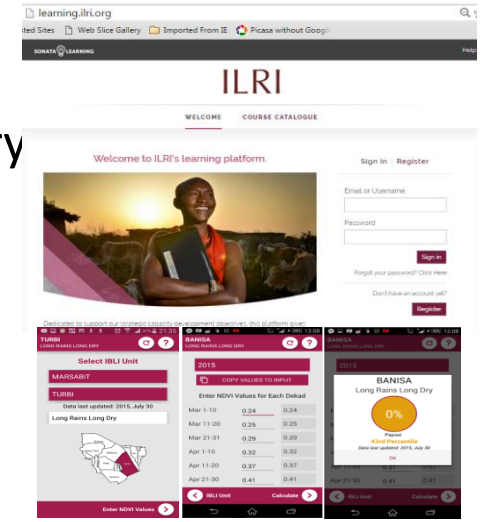
GAPS & OPPORTUNITIES

BEYOND REMOTE SENSING…

Information scarcity (collection/dissemination) is severely limiting development and resource management in the pastoral areas of Africa

How to close this gap in a sustainable way?

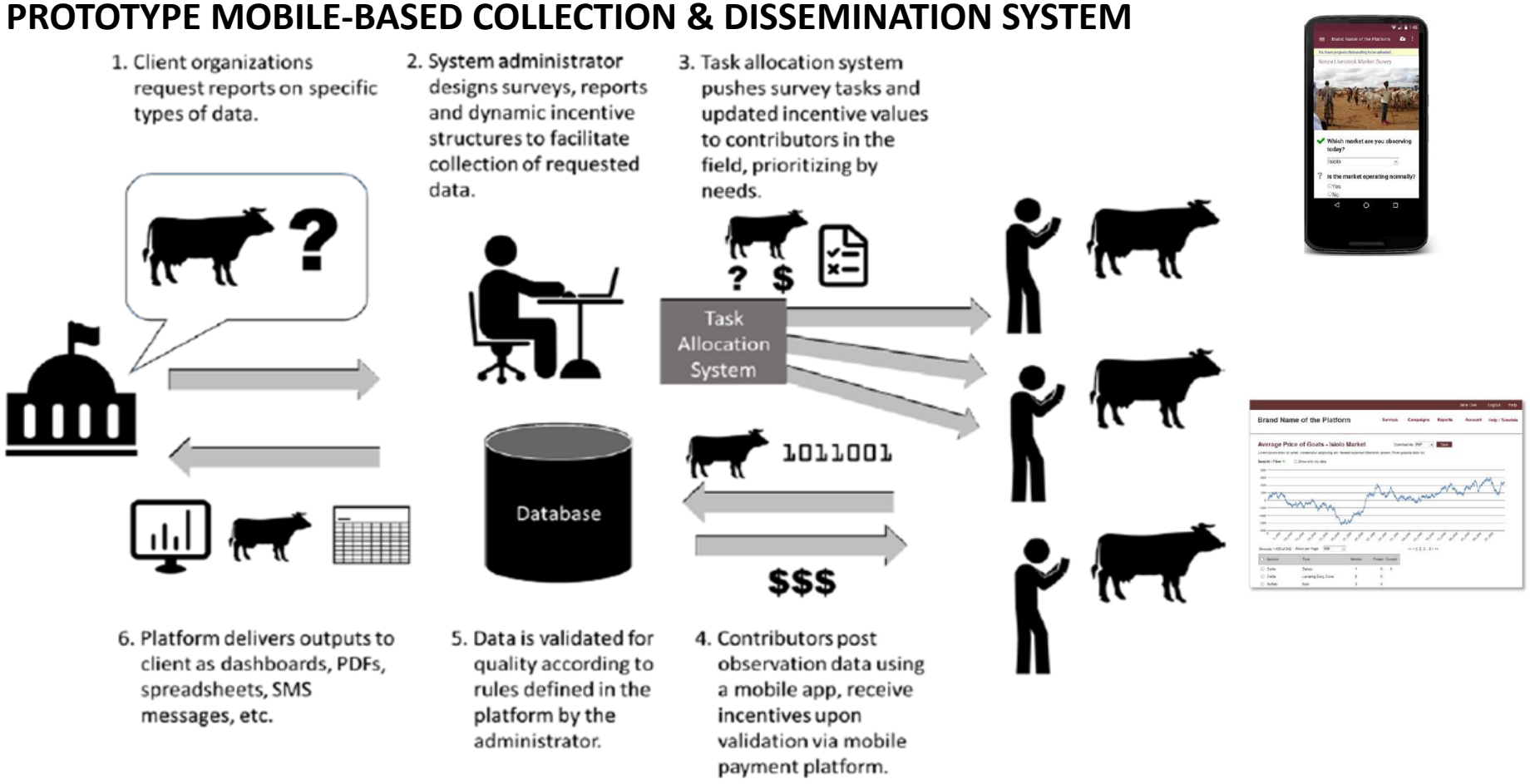
- ❑ Need timely, accurate and spatial explicit data collection and information extraction approaches (but cost effective!).
- ❑ Needs to bundle multiple “services” (feed & forage, veterinary information, market information, rangeland condition, etc).
- ❑ Need of efficient information dissemination and continuous capacity/awareness support (m-Learning).



GAPS & OPPORTUNITIES

Multi-scale EO-Data in combination with Mobile technologies , crowdsourcing and big data analyses (computer vision, machine learning...)

PROTOTYPE MOBILE-BASED COLLECTION & DISSEMINATION SYSTEM



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