



# Knowledge Production, Access, and Use at Local Scales in Northern Tanzania

**Meaghan Daly** <sup>1,3</sup>, **Eric Lovell** <sup>2,4</sup>,  
**Dr. Mara Goldman** <sup>2,4</sup>, **Dr. Lisa Dilling** <sup>1,3</sup>

CSTPR Seminar Series  
University of Colorado Boulder  
February 5, 2014

1 Environmental Studies Program, University of Colorado Boulder

2 Department of Geography, University of Colorado Boulder

3 Center for Science and Technology Policy Research, University of Colorado Boulder

4 Institute of Behavioral Studies, University of Colorado Boulder

# Background:

## Knowledge and Climate Adaptation in East Africa





Tanzania Daily News (Dar es Salaam)

EMAIL PRINT SHARE

## Tanzania: Historical Weather Indicators Identified

29 JANUARY 2014

### RELATED TOPICS

#### Tanzania

East Africa: University of Dar es Salaam...

#### Climate

Zimbabwe: 'Africa's Deliberate Changes

THE Tanzania Meteorological Agency (TMA) has called for the need for environmental conservation especially on preservation of the indigenous historical indicators on weather forecast.

Giving the findings of a research conducted by the agency, TMA Director, Dr Agnes Kijazi said it has been found out that there is a relationship between indigenous knowledge and scientific convection forecast.

“It has been found out that there is a ***relationship between indigenous knowledge and [the] scientific convective forecast.***”

“It is important therefore to ***conserve the historical forecast indicators***...which are perishing due to the lack of environmental conservation and climate change”

“...locals are cutting the trees which are key gauges for the forecasts... ***need to educate them*** [locals] on the importance of environmental conservation.”



# Project Rationale

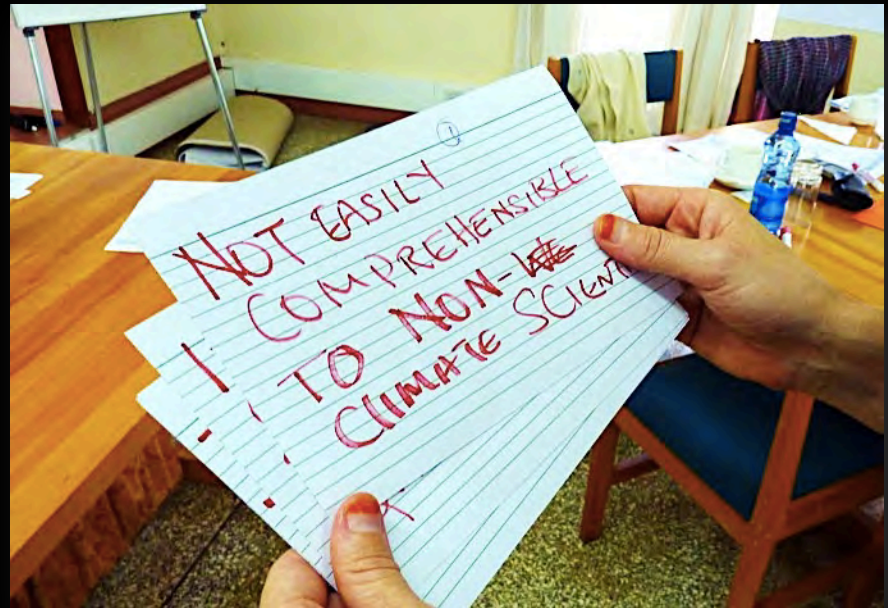


- Recognition of need for multiple forms of knowledge (e.g., scientific, indigenous) within adaptation planning
- Co-production has been offered as an approach to enable inclusion of multiple forms of knowledge
- How to appropriately support co-production remains an open question

# Knowledge Co-production

“....the collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem and build an integrated or systems-oriented understanding of that problem.”

- *Armitage et al. (2011)*



# Challenges to Co-production

## **Problem #1:** Knowledge Criteria

Scientists, policy-makers, and average citizens often have different ways of evaluating whether or not knowledge is usable for practical decisions.

## **Problem #2:** Power Relations

Certain scientists, policy-makers, or citizens have more or less influence over what knowledge is produced and included within decisions.

# Research Questions:

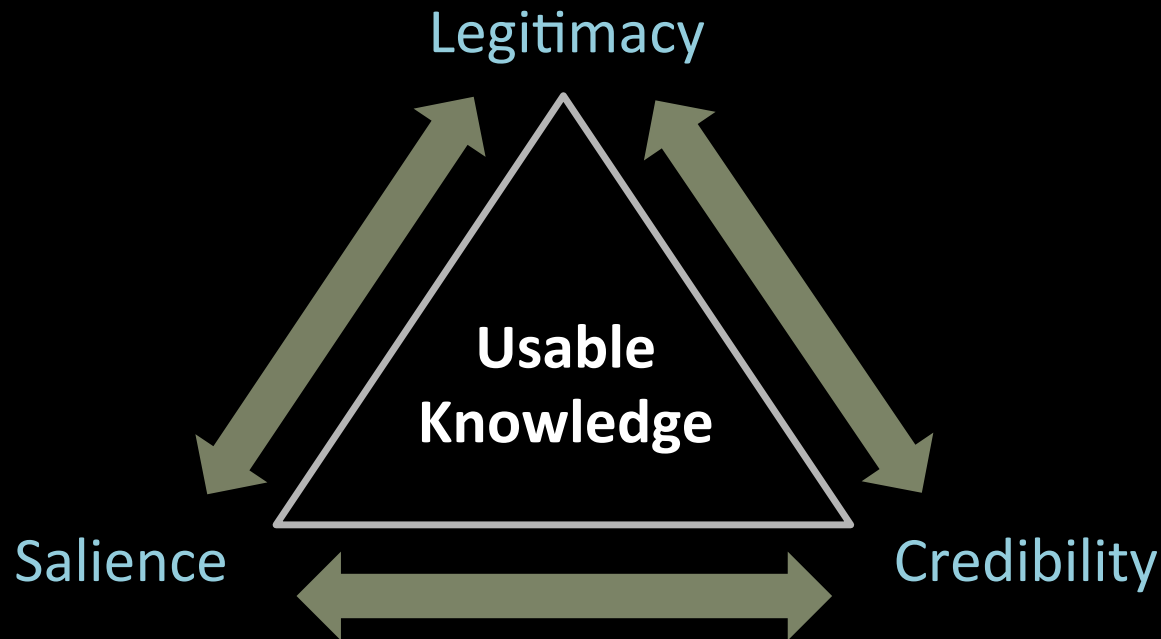
What knowledge is currently being incorporated within adaptation decision-making across scales?

How do efforts to bring together multiple forms of knowledge influence the perceived salience, credibility, and legitimacy of knowledge?

How are relations of power perceived by actors at different institutional scales and/or within different epistemological settings and how does this influence production and use of knowledge?

How do processes of co-production affect power dynamics and how does this influence knowledge production and use?

# Usable Knowledge Criteria

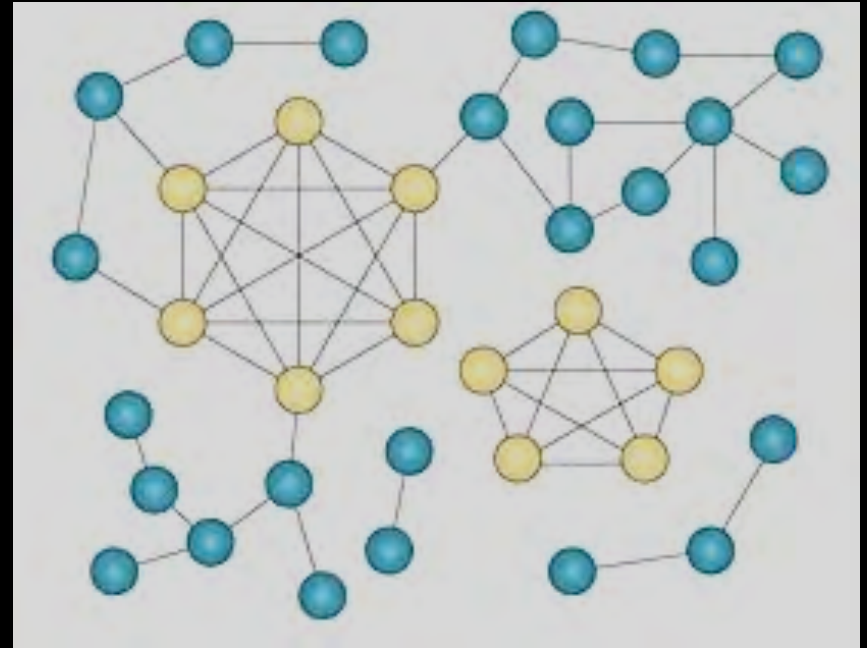


A systematic framework for understanding how different actors understand what makes knowledge “usable” for decisions.

*Adapted from Cash et al. 2003*



# Modified Actor Network Theory



- How is knowledge produced and by whom?
- How does knowledge travel?
- How is knowledge used and why?
- How is power distributed among actors within networks?
- How does this influence knowledge flows?

*See, for example, Burgess et al. 2000; Rocheleau 2011*

## **Problem #1:**

Varying criteria for  
usable knowledge



Usable Knowledge Criteria



Surveys

Interviews

Focus Groups

Ethnographic  
Observation

Village  
National  
International

Village  
National  
International

Village  
National  
International

Village  
National  
International

## **Problem #2:**

Power relations and  
knowledge flows



Modified Actor Network

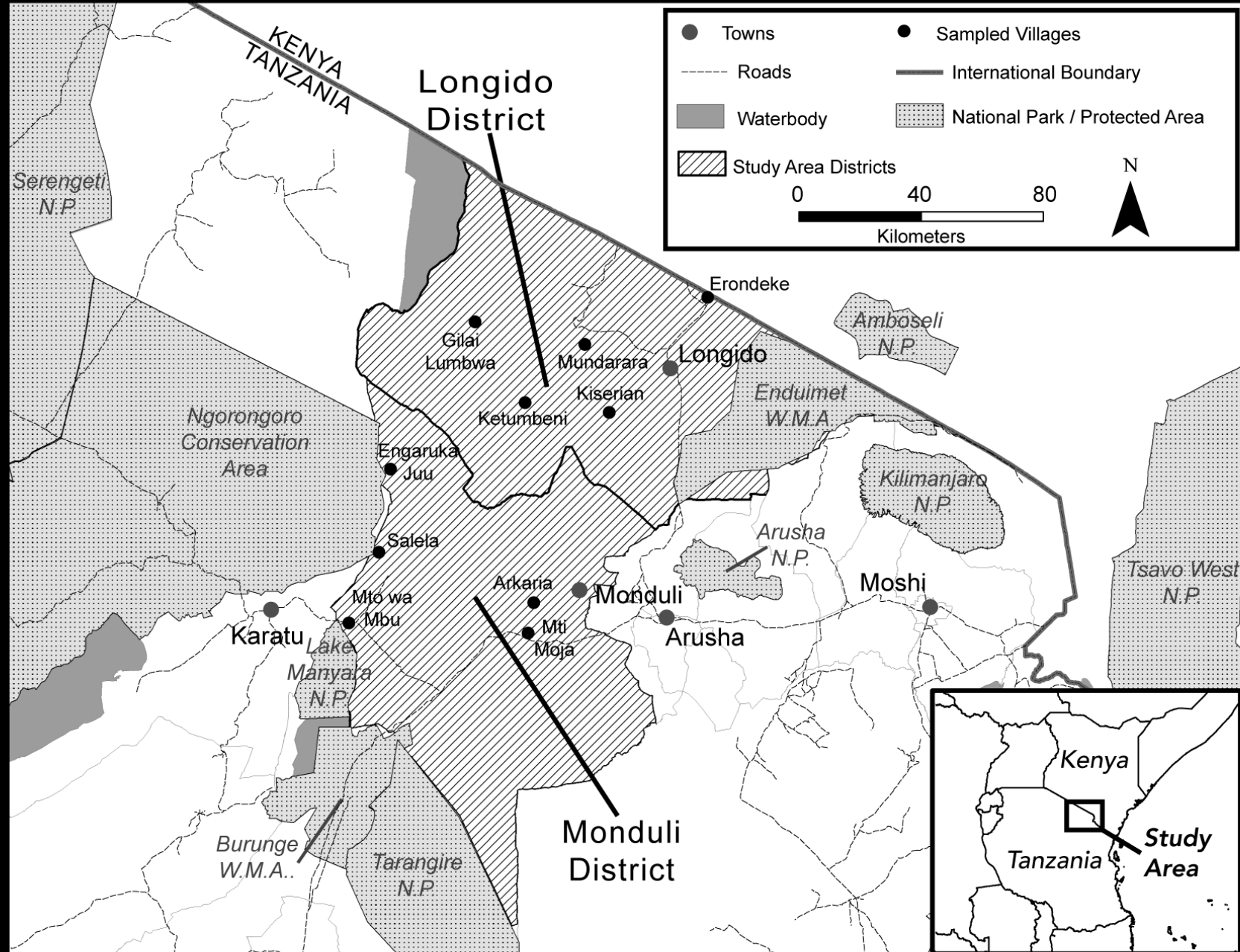


# Agro-Pastoral Livelihoods in Northern Tanzania



**Mobility** has been a key strategy to deal with the spatial and temporal variability of the rangeland

# Study Area





# Research Methods and Design

## **Village – Longido & Monduli Districts, Tanzania**

Survey (n=200)

Focus Groups (n = 10)

Interviews (n=40)

Ethnographic observation (2 villages)

*Participants stratified by class, gender, age*

## **National – Arusha Region & Dar es Salaam, Tanzania**

Survey (n=30)

Focus Groups (n=1)

Interviews (n= 20)

Ethnographic Observation (2 organizations)

*Participants stratified by community of practice*

## **International – Dar es Salaam, Tanzania & Nairobi, Kenya**

Survey (n=30)

Focus Groups (n=1)

Interviews (n=20)

Ethnographic Observation (2 organizations)

*Participants stratified by community of practice*

# Preliminary Data

Village Level Survey:

Longido and Monduli Districts, Tanzania

(n=198)

## Current Knowledge Flows and Use

- **92% feel** seasonal prediction more difficult
- Decrease in use of indigenous forecasting
- **45%** already received forecasts via radio
- **26%** actively seeking new info
  - Of these, **64%** seeking forecasts
- **47%** do not receive external climate info

# Preliminary Data

Village Level Survey:

Longido and Monduli Districts,

Tanzania

(n=198)

## Criteria for Usable Knowledge

- **Credibility:**
  - whether others also used (62%)
  - personal experience (41%)
- **Salience:**
  - relevance of info to decisions (38%)
  - previous use (17%)
- **Legitimacy:**
  - transparency of info (15%)
  - participation in production (1%)

## *Climate isn't the only thing that's changing...*

Perceptions of changes in climate were bundled with a range of other changes in the socio-ecological system.

- Land use and environmental conditions
- Human and livestock health
  - Disease
  - Cattle – milk production
- Cultural practices
  - Governance
  - Inter-generational relations
  - Marriage
- Religion
- Development and Education
  - “More science and technology”



(Based on discussion group and interviews data collected June – Dec 2013)



# Epistemic Frames

## Customary Beliefs:

*“People are suffering because of the church. People no longer know to follow the traditions. “*

*“Before people all believed in one thing, and now they believe many. This change in the weather is a punishment for not following the traditions. “*

## Formal Religion:

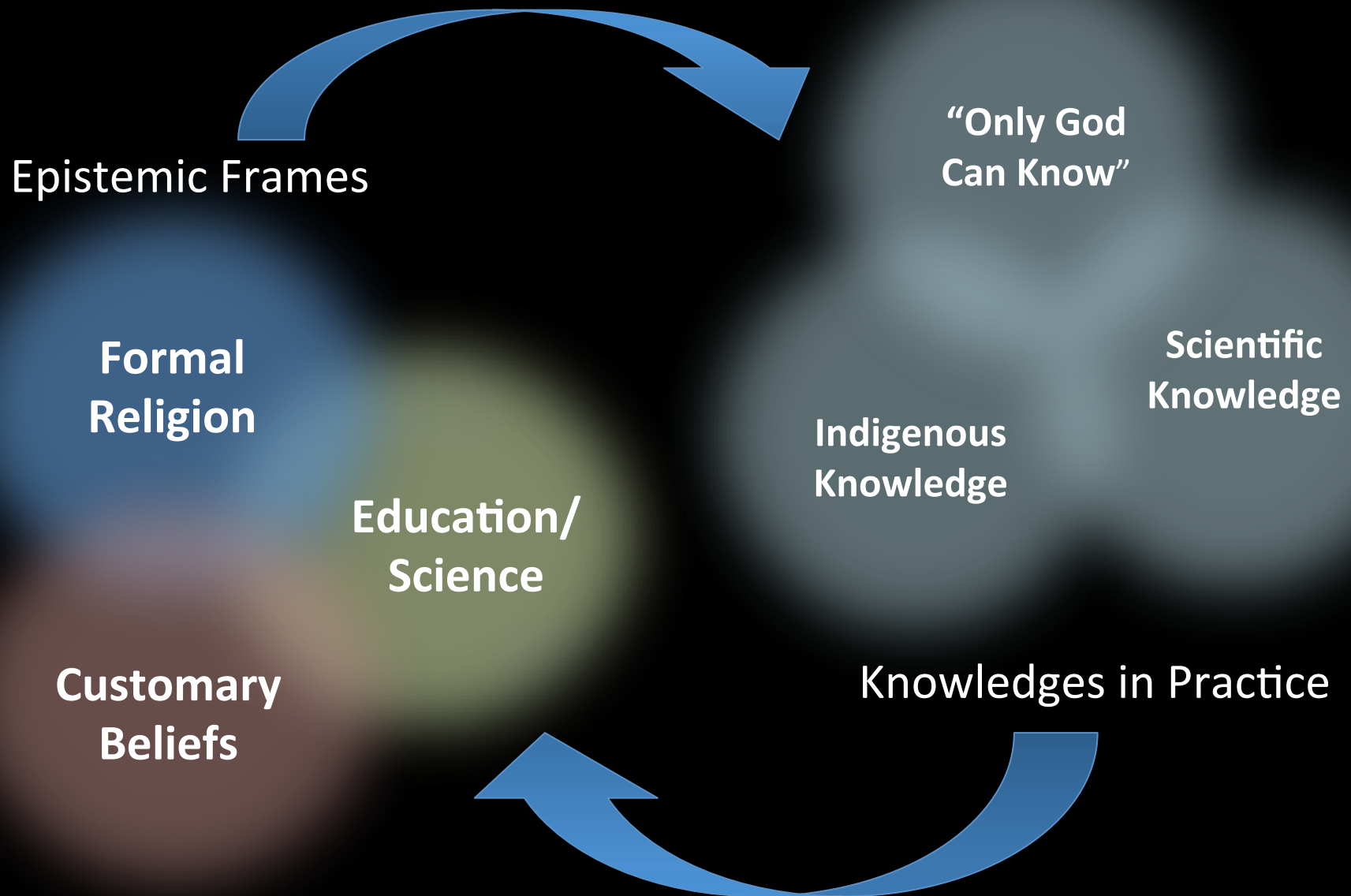
*“Only god can know what will happen. There is no need to blame the government for incorrect predictions and when what the radio says is not the truth. “*

## Education/Science:

*“But traditional knowledge isn’t really working now. Now we just follow the calendar. “*

*It would be better for the government to increase the number of experts, who can bring more science. It would be better for people to get more education so that they could better understand the forecasts.*

# Epistemic Frames and Knowledges in Practice



# But knowledge is both partial and dynamic...

*When he was young, he saw evidence of women praying, goats being slaughtered, and his father predicted the weather, and these were right many times. So the traditional ways can be true. But at the same time, in 1998 he heard about El Niño on the radio and this came true. There were several other times when the scientific forecasts were true. So in this sense he is not on either “side” but believes that both might have some “truth”.*

*- Elder Man from Arkaria Village, Monduli District*

# Credibility of Knowledge

*People use multiple criteria to evaluate whether knowledge is credible...*

- Vetting information at multiple institutional scales
- Physical verification
- Delivery via in-person communication
- Use by others in the village
- Willingness to share information
- Perceptions of “expertise”
- Positive relations in other spheres
- Ethnic, cultural, or tribal affiliations



# Credibility of Knowledge

A sepia-toned photograph of a savanna landscape. In the foreground, a large, dark silhouette of an acacia tree stands prominently on the right. The ground is covered in low-lying vegetation. In the background, a line of smaller trees and bushes stretches across the horizon under a sky filled with large, dramatic clouds. The overall mood is contemplative and somewhat somber.

***Important factors that can negatively affect credibility of knowledge...***

- Once burned, twice shy
- Institutional level of knowledge matters
- Conflicting epistemological frames

# Salience of Knowledge



- Info about the future not always more useful than info about current conditions
- Most useful for planning farm activities
- Some features of climate more relevant than others to decisions



# Legitimacy of Knowledge



- Indigenous knowledge does not “fit”
- IK valued at village level, but not beyond
- Education seen as “gateway” to accessing knowledge and ensuring inclusion of IK



# Implications & Next Steps





# Questions?

[meaghan.daly@colorado.edu](mailto:meaghan.daly@colorado.edu)

[eric.lovell@colorado.edu](mailto:eric.lovell@colorado.edu)

[mara.goldman@colorado.edu](mailto:mara.goldman@colorado.edu)

[ldilling@colorado.edu](mailto:ldilling@colorado.edu)





**And many, many thanks to:**

*Alais Morindat, Communities in Longido and Monduli Districts,  
Shayo Alakara, Agness Porokwa, Majembe ya Kazi, Ally Msangi,  
Joseph Rutabingwa, Univ. of Colorado Innovative Seed Grant Fund*