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

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Background:
Knowledge and Climate Adaptation in East Africa
“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.”
• 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?
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

Problem #2: Power relations and knowledge flows

Usable Knowledge Criteria

Modified Actor Network

Surveys
Interviews
Focus Groups
Ethnographic Observation

Village National International
Village National International
Village National International
Village National International


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

- Longido District
- Monduli District

Key:
- Towns
- Sampled Villages
- Roads
- International Boundary
- Waterbody
- National Park / Protected Area
- Study Area Districts

Study Area

- Lake Manyara N.P.
- Ngorongoro Conservation Area
- Serengeti N.P.
- Kilimanjaro N.P.
- Arusha N.P.
- Tsavo West N.P.
- Kenya
- Tanzania

Scale: 0 40 80 Kilometers
## Research Methods and Design

### Village – Longido & Monduli Districts, Tanzania
- Survey (n=200)
- Focus Groups (n = 10)
- Interviews (n=40)
- Ethnographic observation (2 villages)

### National – Arusha Region & Dar es Salaam, Tanzania
- Survey (n=30)
- Focus Groups (n=1)
- Interviews (n= 20)
- Ethnographic Observation (2 organizations)

### International – Dar es Salaam, Tanzania & Nairobi, Kenya
- Survey (n=30)
- Focus Groups (n=1)
- Interviews (n=20)
- Ethnographic Observation (2 organizations)
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.

See Lave and Wenger 1994; Shaffer 2004
Epistemic Frames and Knowledges in Practice

Epistemic Frames

- Formal Religion
- Customary Beliefs
- Education/Science
- Indigenous Knowledge
- Scientific Knowledge

"Only God Can Know"

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

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?
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