

Can smartphones enhance social learning in FRNs?

Part 1: Background info

A collaborative research project by the Kenya AE Hub, FRN NGO and MLP

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Who and what

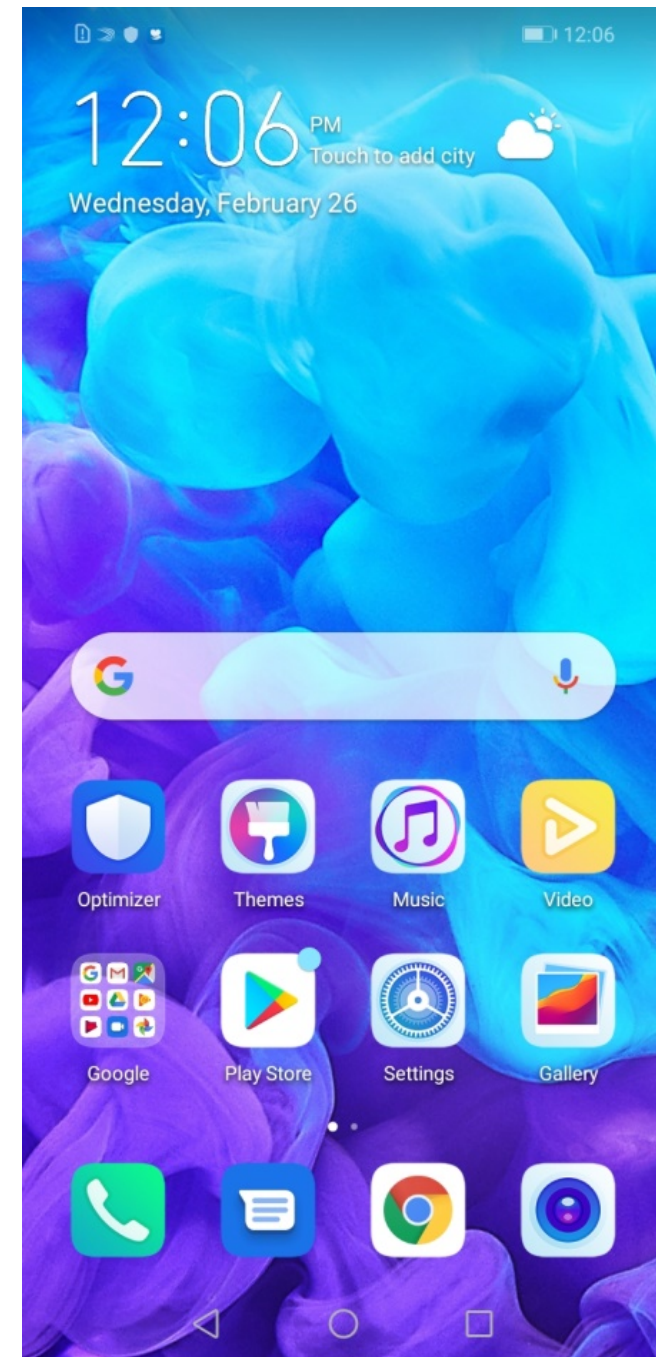
- We're a group of 3 Kenya based CCRP projects- FRN NGO, MLP and AE Hub, all with a keen interest in helping farmers to improve soil health, using knowledge-based and dialogue oriented approaches
- We're working with 347 Kenyan farmers affiliated with 8 NGOs.
- Farmers who belong to the FRN all struggle with the parasitic weed, striga. This greatly reduces the productivity of their maize and/or sorghum fields. For the soil health research, farmers are investigating if materials such as biochar, lablab residues and boma compost can reduce striga problems, increase staple crop yields and change soil health tests results compared to their baseline results.

The CCRP projects support 8 NGOs, who in turn facilitate the participation of 347 soil health FRN members in the Lake zone



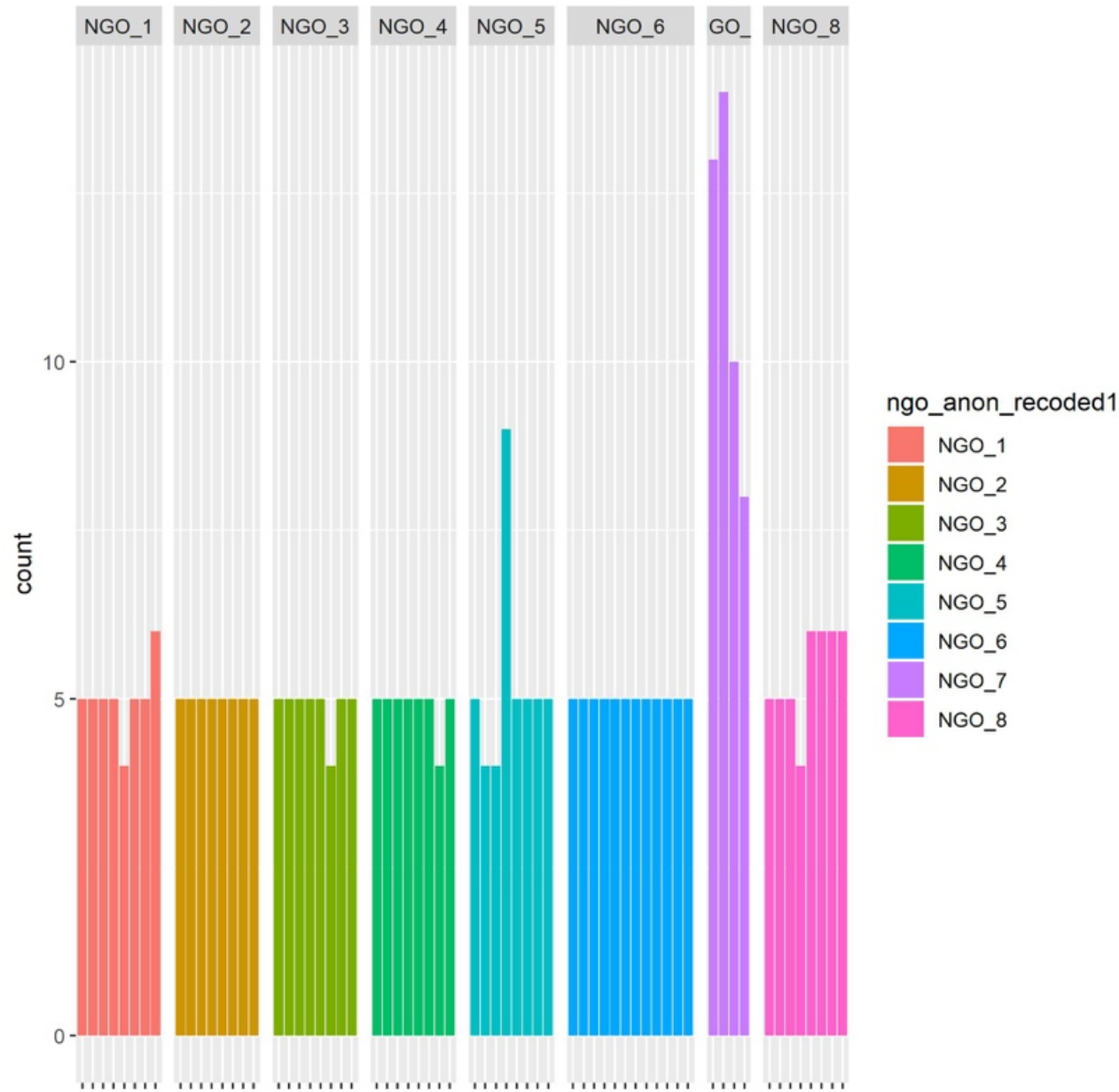
What's this about phones?

- We gave smartphones to 64 small clusters of neighbouring farmers participating in our soil health FRN.
- Our hypothesis? That smartphones could spur more social learning within the FRN
- How?
 - using the phones to document and share research and own farm experiences -- via pictures, voice recordings and short videos clips via whatsapp
 - watching and discussing the AccessAg Kiswahili agricultural videos that came pre-loaded on the phone
 - using the internet to find other information



FRN smartphone clusters

- The 64 smartphone clusters were affiliated with the 8 different NGOs
- Most NGOs managed 8 clusters of 5 people each. But NGO 7 had clusters that ranged in size from 8-14 members.
- NGO 6 managed more clusters, NGO 7 had fewer.



The process

- We designed a planned process and only gave the clusters the smartphones at the end of it (it took a long time!)
 - Socialize principle of equity around the cluster phone use- it belongs to the cluster and should be shared equitably by all
 - Discuss ways the cluster could use the phone: to share what they're learning about the research interventions, to learn from pre-loaded videos, to search for relevant information on the internet, etc
 - Clusters were required to develop their own rules to govern the use of the shared phone and appoint a phone custodian. They shared with us both the copies of their rules and the rationale for choosing the particular custodian.
- Each cluster received basic training on how to use their smartphone touchscreen to send texts, take photos, watch videos, use whatsapp,

Our research questions on the phones

1. Governance: What rules did farmers set for themselves to govern shared use?
2. Control of device: What were the reasons given and/or the characteristics of farmers chosen for the device custodian?
3. Group dynamics: How are the phones affecting group dynamics?
4. Access: Are cluster members satisfied with their access? Why or why not?
5. Charging: How are members managing airtime, data bundles and phone charging?
6. Challenges: What kinds of challenges are members facing with regards to the phone?
7. Training effectiveness: Was the phone use training effective? Can each member satisfactorily operate the phone, specifically to (i) Take a picture, (ii) watch a video, (iii) send a message via WhatsApp, (iv) perform a google search?
8. Information systems: What kinds of information are farmers sharing with one another? About the research? About the videos? What other kinds of information are farmers accessing on the phones and for what purpose? Are the phones able to be used effectively across clusters?

Follow-up and preliminary results

- The clusters got their phones in April.
- In August, each NGO followed up with their farmers.
 - Cluster level- had FGD with each cluster, asked to explain all the ways they'd been using their phone; about any challenges they were experiencing, how they were managing charging, airtime and data bundles; whether they'd revised their initial rules or changed the phone custodian.
 - Individual level- cluster members were interviewed separately and asked to rate the personal value they'd gotten from the phone and explain why they'd given the rating and what features they were able to use

Part 2

Clusters' challenges with their smartphones

Challenges types emerging from FGDs

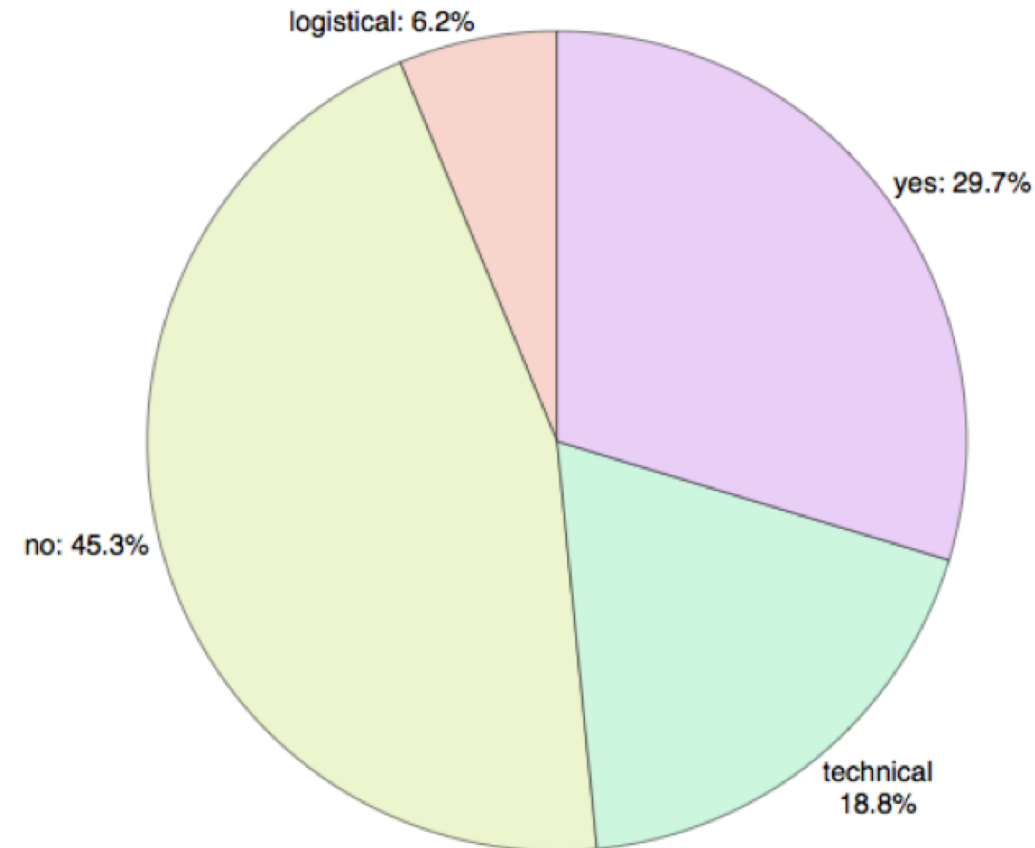
NGO field staff held FGDs with all the phone clusters

Each cluster was asked about any challenges they were experiencing with their smartphone.

We grouped their responses into 4 challenge categories:

no=none; technical, logistical and yes-
all other challenge types

Distribution of Challenge recode



No challenges were experienced by nearly half of clusters

- Groups with no challenges felt the phone was serving their cluster very well.
- Members said that the rules they'd drawn up were working well and the custodian was doing a good job keeping the phone safe and available.
- Members did not complain about weekly contributions for airtime and/or data bundles
- Generally, comments show lots of satisfaction with how the phone (videos and research progress sharing) has brought the group together.

Technical challenges

Around 20% of the clusters were experiencing technical challenges where some cluster required additional assistance from other cluster members.

For example

- Some cluster members still did not know how to operate the phone
- Some members had language issues and were not able to understand Kiswahili well enough to watch the videos without translation.
- These groups were also basically happy with their phone rules and custodian and members did not complain about contributing to phone costs.

Logistical challenges

Several clusters said they were experiencing logistical challenges that were making it difficult to come together as often as they would have wished, especially for video watching.

For example:

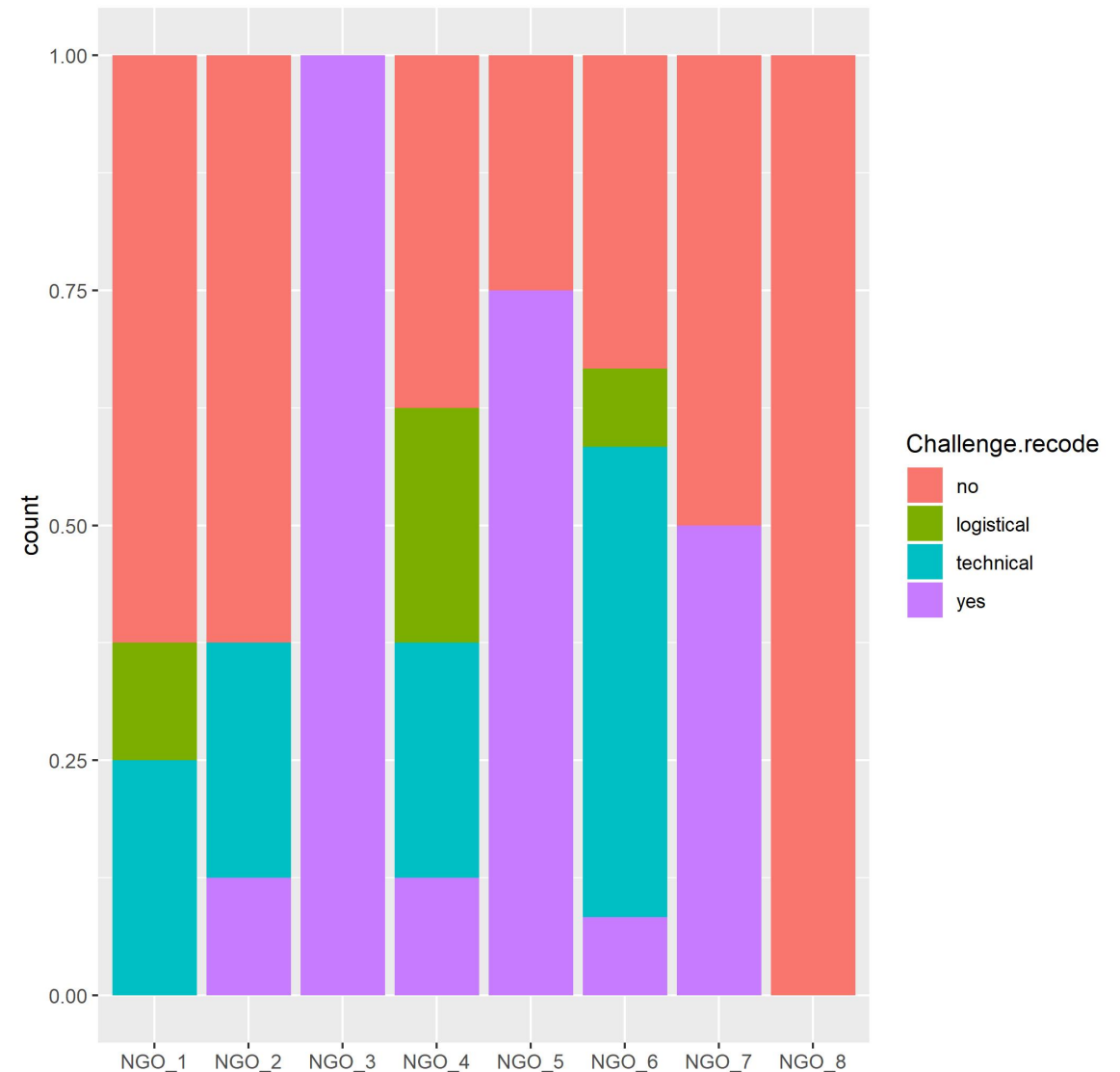
- The cluster members lived too far apart
- The cluster members seemed to have conflicting schedules

Other types of challenges

- Some groups were too large- thus the challenge was that individual members did not have as much access to the phone as they would have liked. They requested more phones so they could split their group.
- But there were other challenges that signaled other kinds of dissatisfaction within the group. These seemed to be related to the way the phones were introduced to the clusters

Challenge types varied by NGO

- We observed a highly significant chi square ($p < 0.001$) for NGO and challenge type
- For NGO 7, the main challenge was the large group size
- NGOs 3 and 5 appear to have a very large number of clusters in the 'yes-other challenges' category



What was happening in clusters affiliated with NGO 3

- Some clusters with members dissatisfied with their phone access. Phone was only available to members at group meetings but they wanted more time (to watch videos!)
- Several complaints about the phone being costly to maintain, a comment that was rare for clusters in the other 3 challenge categories the phone. However, it is worth noting that the area is more established than some of the other areas served by NGOs and smartphone ownership was not uncommon.

We referred back to the minutes of the meeting where phone ideas were socialized and the group rules were drawn up.

- Appears the principles behind equitable phone use weren't discussed
- Members were told the phone was for data collection and research

This appears to have affected the group's phone use rules (rules not well thought out or focused on equity).

Issues raised in clusters affiliated with NGO 5

- NGO 5 had 6 out of 8 groups in the 'other challenges' category.
- This NGO submitted almost no individual farmer comments. However, for the one group where individual farmer comments were recorded, cluster members spoke out directly against the phone keeper, who was not present at the meeting, saying *"It's only the person keeping the phone that enjoys the phone use....the phone holder has not shared any videos with the cluster members but does share with their friends outside the group."* This group was also larger than all the others for the NGO.
- We also observed clusters that set strict rules (anyone in possession of phone that is lost, stolen or broken will replace the device at their own expense), which became a disincentive to member phone use. No one wanted to risk taking the phone home in case something happened, especially since everyone's kids were home due to covid.
- A couple of clusters mentioned covid restrictions meant they weren't meeting, and their area was an up-country covid hotspot.

Key takeaways

Cluster size: Having 5 farmers share a phone seemed to be working reasonably well. Members of larger groups feel disadvantaged in terms of access.

Phone socialization process: Though we have not yet analyzed all the cluster phone rules, we'll want to follow up carefully to assess if there were in fact differences. Does failure to socialize phone use equity result in more wrangles in the groups, with reduced learning benefits for individual members?

Part 3

What individual value were FRN members getting from their cluster smartphone?

Smartphone value to individual farmers

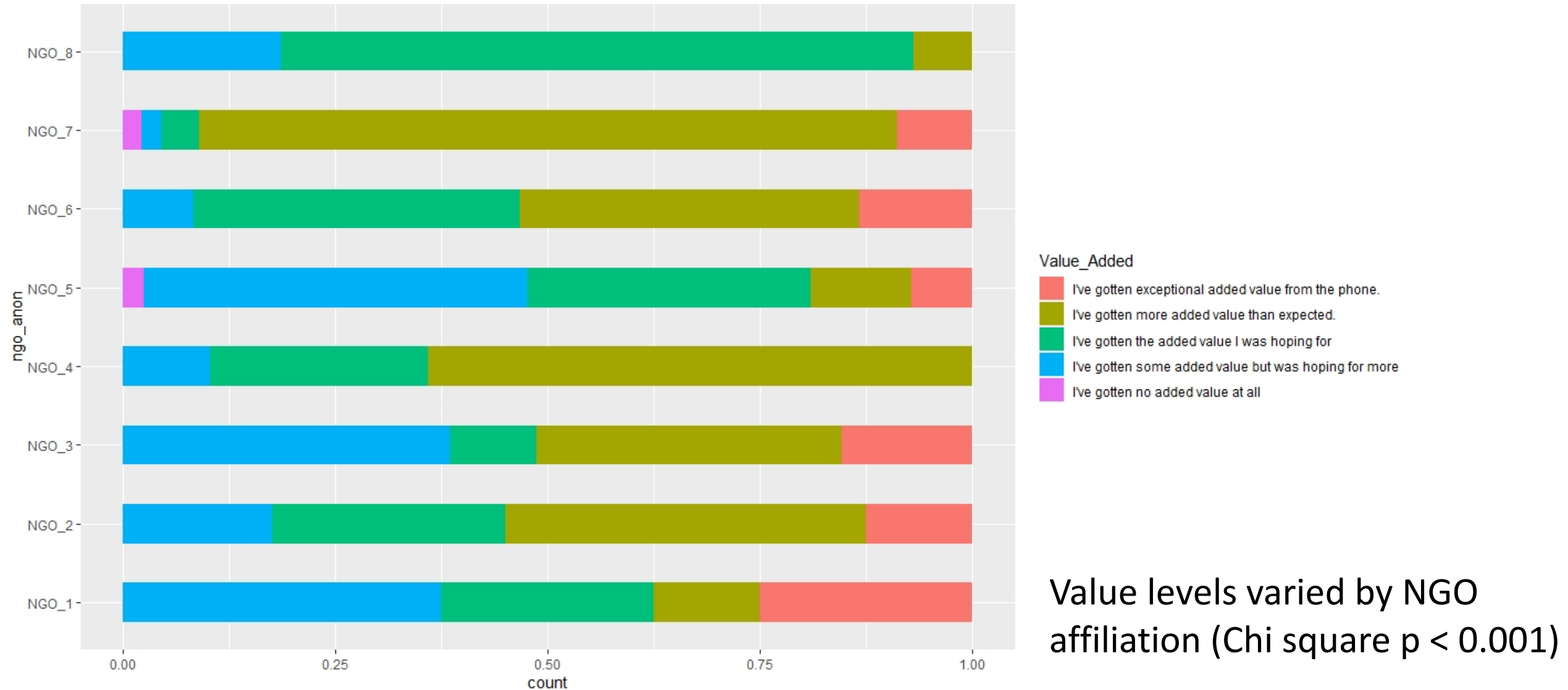
All 347 individual farmers were asked to rate the value that they had gotten from their cluster's smartphone.

Rating choices

1. No added value at all
2. Some value but had hoped for more
3. Gotten the value I was hoping for
4. More value than I expected
5. Exceptional value

Summary of individuals' ratings by NGO

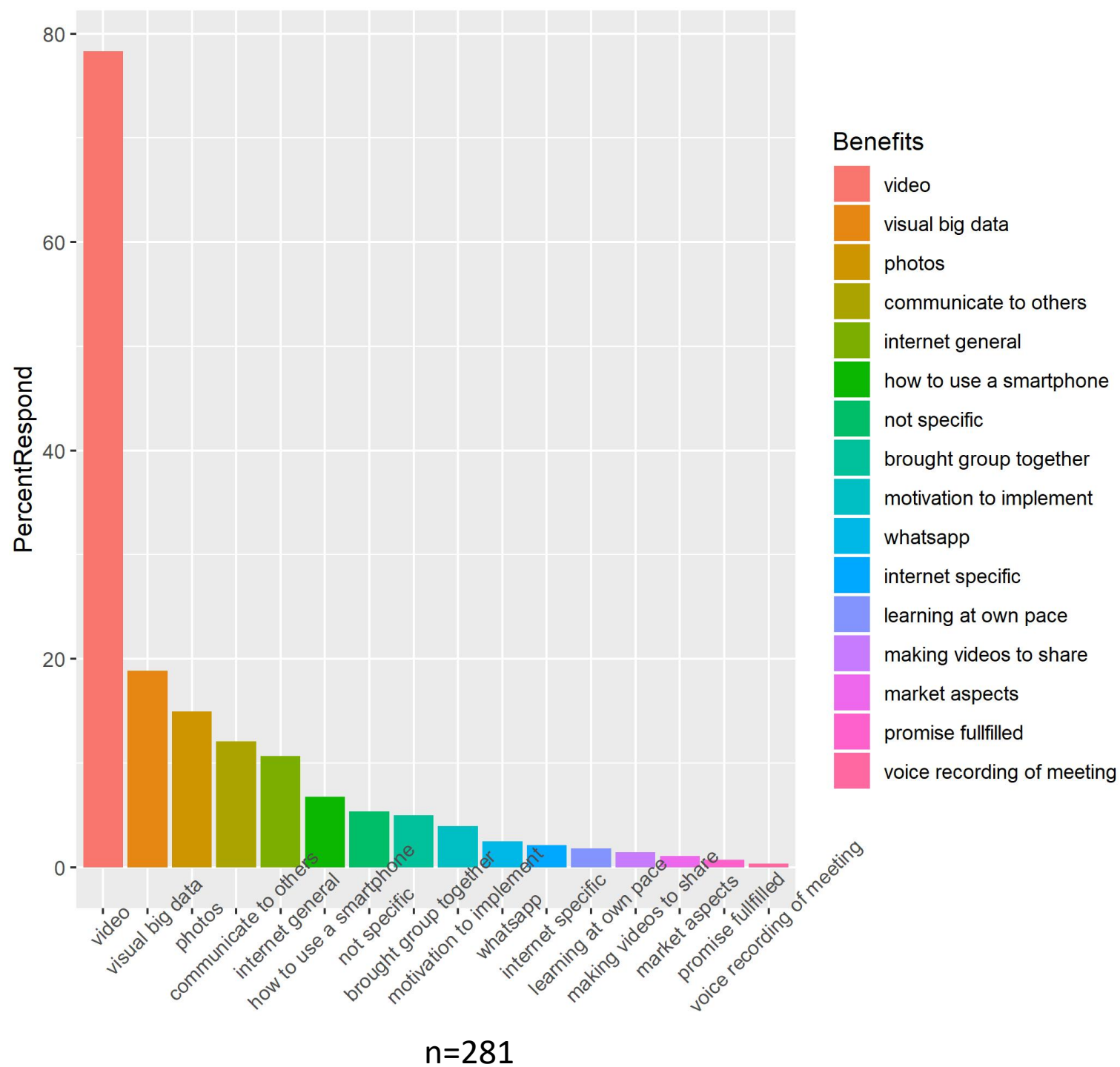
n= 347



Interpretation of ratings

- 78% of the farmers said they got the value that they expected or beyond, 21% said they wished they'd gotten more value
- Although data collectors were asked to record all reasons behind a rating, we still ended up with 66 farmers with no reasons recorded - about 50% of these were from NGO 1 and 5, which had more clusters experiencing dissatisfaction, making it hard to thoroughly understand factors contributing to the lower ratings
- Interestingly, a closer look the extreme ends of the rating scale where we do have farmer's comments, revealed unexpected reasons as discussed below.

All benefits
referenced by
farmers when
justifying their
value rating



Videos rule!

- The phones came pre-loaded with over 100 Kiswahili videos that didn't cost farmers any money to watch.
- The videos feature small-scale farmers showcasing useful (and mostly low tech) practices and innovations, which totally resonated with farmers and motivated them to action. (If those farmers in the video can do it, so can we!).
- There was a very large proportion of members from NGO 7 who said they got more value than expected. Reading the comments show this was because of the videos, since they had originally been told the phones were for "research".

Videos stimulated lots of learning

- The cluster members met regularly to watch the videos. They talked about them with one another. They said they were discussing them with family, friends and neighbors.
- Where a single self-help group had been split into several clusters, you could see from the comments that the clusters were sharing information within their larger groups about especially good video. Especially good videos were those that farmers saw as relevant in their agricultural system (such as control of striga, improving cassava performance, being more successful with local chicken) and you'd see the same videos referenced over and over by different members of the same groups.
- Lots of individuals mentioned that they'd made substantive changes to one or more farming practices as a result of something they'd learned in a video.

Highest value ratings almost always due to satisfaction with specific video content

Interestingly, the particular videos that a farmer found (or did not find) on the cluster phone highly influenced their personal value ratings

Giving a value of 5 (exceptional value) usually meant the person had learned something they considered personally important.

From the field staff interview notes:

- *“He's a poultry keeper and gained a lot from videos on poultry feeds formulation and chicken feeding methods. Also the videos on dairy goats.”*
- *“Being from a mango growing village, watching how weaver ants control mango pests gave joy about a possible remedy to mango pest problems. She also learned how to use grass strips to control erosion in her farm and use crop residues to make compost.”*
- *“She said she learned many things from the videos, like how groups can work together to control striga by uprooting and burning”*

Lowest satisfaction ratings frequently related to the absence of specific video content or language barriers

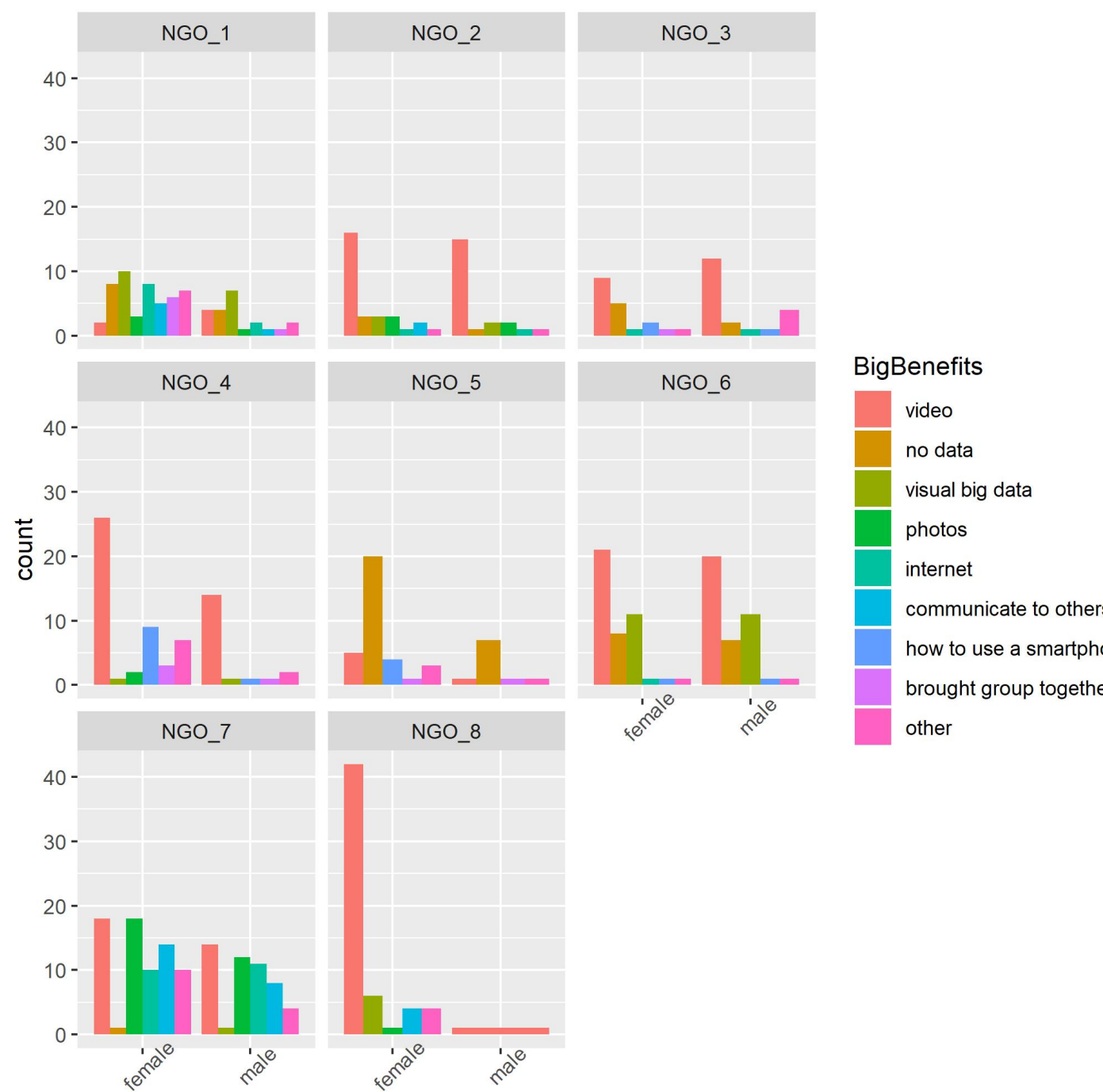
- In contrast, ratings of 2 (have gotten some value from the phone but would have liked more) were from farmers who were disappointed when they didn't find the video they wanted.
- We see a farmer who rears pigs giving a 2 because there's no pig video* , ditto for the tomato and banana farmers who missed the video to help them cope with their pest and disease challenges.
- 2's were also awarded by female non-Kiswahili speakers who couldn't understand the videos without translation from someone else in their cluster

* and when she searched for pig rearing info on the internet she found the results confusing!

“Big data”- smartphone visual capture of trial happenings gave farmers the means to better integrate the area’s research outcomes

- The second most referenced benefit involved how the phones were helping farmers better understand the research through sharing of member’s trial plot pictures and videos.
- *“She has learnt how she can use big data to gather info such as which varieties to farm in a particular season, which areas would have the right soil to grow them and also what would be the right time to plant”*
- *“We don’t need to travel to a farm in order to have all crops under supervision; pictures are evidence”*
- Frequent visuals from the phone pictures or video clips gave farmers the ability to mentally integrate how intervention, crop variety and context variables (like soil type and planting time) were interacting with each other in their area.

NGOs 1 and NGO 6
(farmer field school
clusters) esp talked about
this... but we don't know
whether the next most
common category
“photos” is actually the
same thing due to poor
field notes!



Data quality differences matter!

Data quality really varied by NGO. It was notably uneven

- i. Some NGOs provided quotes and other rich information from the actual interviews. In these cases, a farmer's rationale for their ratings were clear.
 - ii. Others filtered the information into a shorthand that made it impossible to understand exactly what the farmer meant (no insights from 1 word, like photo).
 - iii. Others never submitted any comments at all
- Data managers should follow up with NGO field staff who are not taking good notes to explain the difference. Or take action to replace them if this is a regular occurrence.

can smartphones enhance social learning in FRNs?

The answer appears to be a definitive “yes!” for the vast majority of farmers!

For the value that the videos are adding, we recommend that CCRP invest in translating more videos with content relevant to our region.

We recommend that FRN projects invest in smartphones, load them up with videos, socialize equity principles of fair and equal phone access, then provide them to small clusters of up to 5 people and show them how to take videos, and photos of their research so members can learn regularly. We’ve seen evidence that this helps them to better understand how the different research interventions are performing in their context.

Our new hypothesis: It’s not that farmers aren’t interested in data. Farmers value and understand more from visual data (regular pictures or videos of FRN members research) compared to written data or data being summarized and/or presented for them by someone else

Thanks

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FRN members for participation in the research

Evans Odhiambo and Lilian Night, data managers at FRN NGO and MLP respectively, and all the field staff of the 8 NGOs

David Stern, for help with the figures