Leveraging Social Networks to Enhance Agricultural Extension

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Evidence to Action: Building Markets for Small-Scale Farmers
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Learning about new technologies

Farmers learn about new technologies in many ways

• Direct trainings and conversations with extension agents
• Learning on the network: can learn from peers who have tried new technologies or been trained by agents
  • In Malawi: Extension agents often use “lead farmer” platform, train a few people per village, let network learning do the rest
  • Training a few to influence many
Integrating Networks into Extension

- Lead Farmer model assumes learning on the network is important.
- We know learning on the network happens... but we don’t know much about how it takes place.
  - Are there farmers who are particularly useful hubs for information?
  - Can we identify them? Easily? Is network theory helpful in doing so?
  - If so, can we get more people to adopt a technology?
Our project in Malawi

- Joint with Lori Beaman, Ariel BenYishay, A. Mushfiq Mobarak
  - Thanks to funders Bill & Melinda Gates Foundation (ATAI initiative) & 3ie
  - Partnership with Malawi Ministry of Agriculture and Food Security
- Randomized intervention to try and leverage network theory in Extension
- Approach: First, map out social connections through a census
- Then, choose the “best” possible people to train
- Compare adoption with “best” partners against existing extension methods
Mapping out Networks

• In three districts in Malawi, we completed a full census in 200 villages
• Ask questions about who people consult on agricultural decisions, previous tech adoptions, and so on
• Census completed using laptops to maximize matching
Who are the best partners?

• Depends on how adoption diffuses through the network
• Will people adopt if they are exposed to one person with the new tech? Do they need multiple people telling them it is effective to be persuaded?
• In general, different optimal people – tradeoff of lightly exposing many versus intensively exposing a few
### Evaluation Strategy

<table>
<thead>
<tr>
<th>Treatment 1: Simple Contagion</th>
<th>• Selection of partners so that the most people adopt if knowing one adopter is usually sufficient</th>
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<tbody>
<tr>
<td>Treatment 2: Complex Contagion</td>
<td>• Selection of partners to maximize adoption if most people need to know at least 2 adopters</td>
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<td>Treatment 3: Geography predicts connections</td>
<td>• Use geography as a proxy to full social network mapping</td>
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<td>Control</td>
<td>• Business as usual: extension agent asks village head to nominate partners</td>
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Training

• Malawi MoAFS train our partner farmers in basin planting
  – Plant maize seeds at the bottom of a small pit – allows water to be used more effectively, prevents runoff
  – Requires labor (to dig pits) but no capital
  – Familiar in West Africa, unfamiliar in Malawi
  – Profitable in agronomic trials, but in the field Malawi?

• Randomized treatment allows direct comparison
  – People we trained vs. people we would have trained if it had been a different treatment group
Pit Planting results in big increases in yields

• Seed farmers on average have 12% higher yields than the potential partners in the village across 3 years of survey
• Seeds adopt Pit Planting about 30% of the time
• Implies a 50% or so yield increase to pit planting
• Our estimates suggest labor time is roughly equivalent to alternatives.
Who we train mattered

• Gradual adoption over time in all villages (from 0 to 8% over 3 years), but
• Simple and Complex treatments beat control
  – 3-7 percentage point treatment effects – much of the overall adoption rate
  – Remember, this is above extension workers choosing carefully – not obvious that network data would beat this
  – Complex – which exposed as many people as possible to both sources of information – performs best in large villages, where learning is probably more difficult
  – BUT – geographic villages look much like control
Conclusions

• First: There are important and valuable technologies for which information is the only constraint to adoption
  • Farmers, like the rest of us, are not perfectly informed
  • Sometimes, even with these technologies, adoption is slow and difficult (still fairly low and increasing in year 3)

• Previous studies: social learning is important for tech adoption

• This study: We can identify partners that increase the speed of diffusion through social networks
  • Looks like best is to treat the densest part of the network intensively rather than going for broad-based exposure.
  • These partners are, though, hard to identify
  • Avenue for future research (& collaboration to bring this to scale!): how to scalably make networks work for policy