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ABDUL LATIF JAMEEL POVERTY ACTION LAB

atai AGRICULTURAL TECHNOLOGY ADOPTION INITIATIVE

Evidence in agriculture: Information and extension

Becca Toole | MIT / J-PAL / ATAI

March 6, 2018

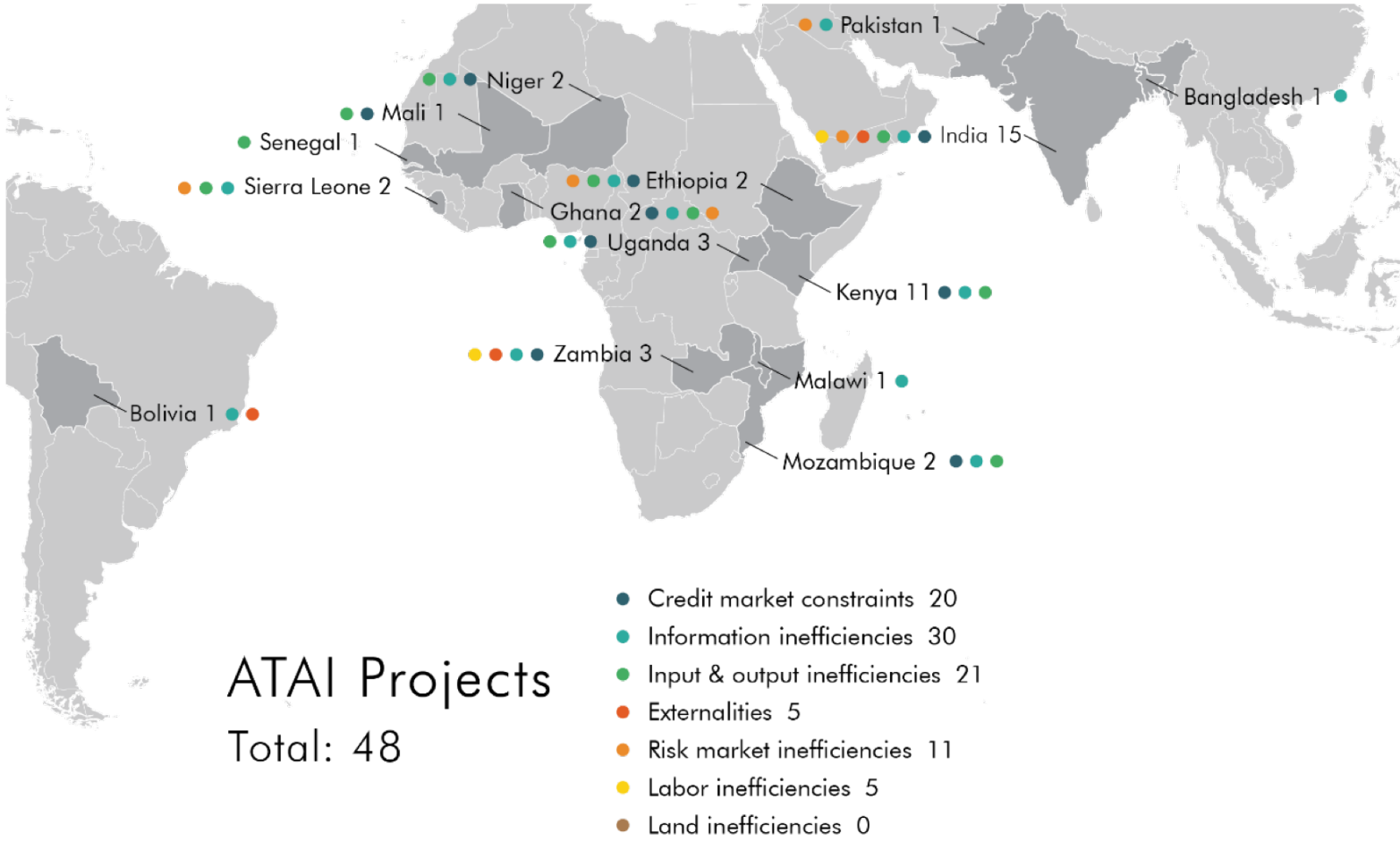
What inefficiencies might constrain technology adoption?

1. Credit markets
2. Risk markets
3. Information
4. Externalities
5. Input / output markets
6. Labor markets
7. Land markets

atai AGRICULTURAL TECHNOLOGY ADOPTION INITIATIVE

Since 2009, ATAI has funded:

- 48 evaluations in 15 countries in South Asia and Africa
- 100+ affiliated researchers and their field partners



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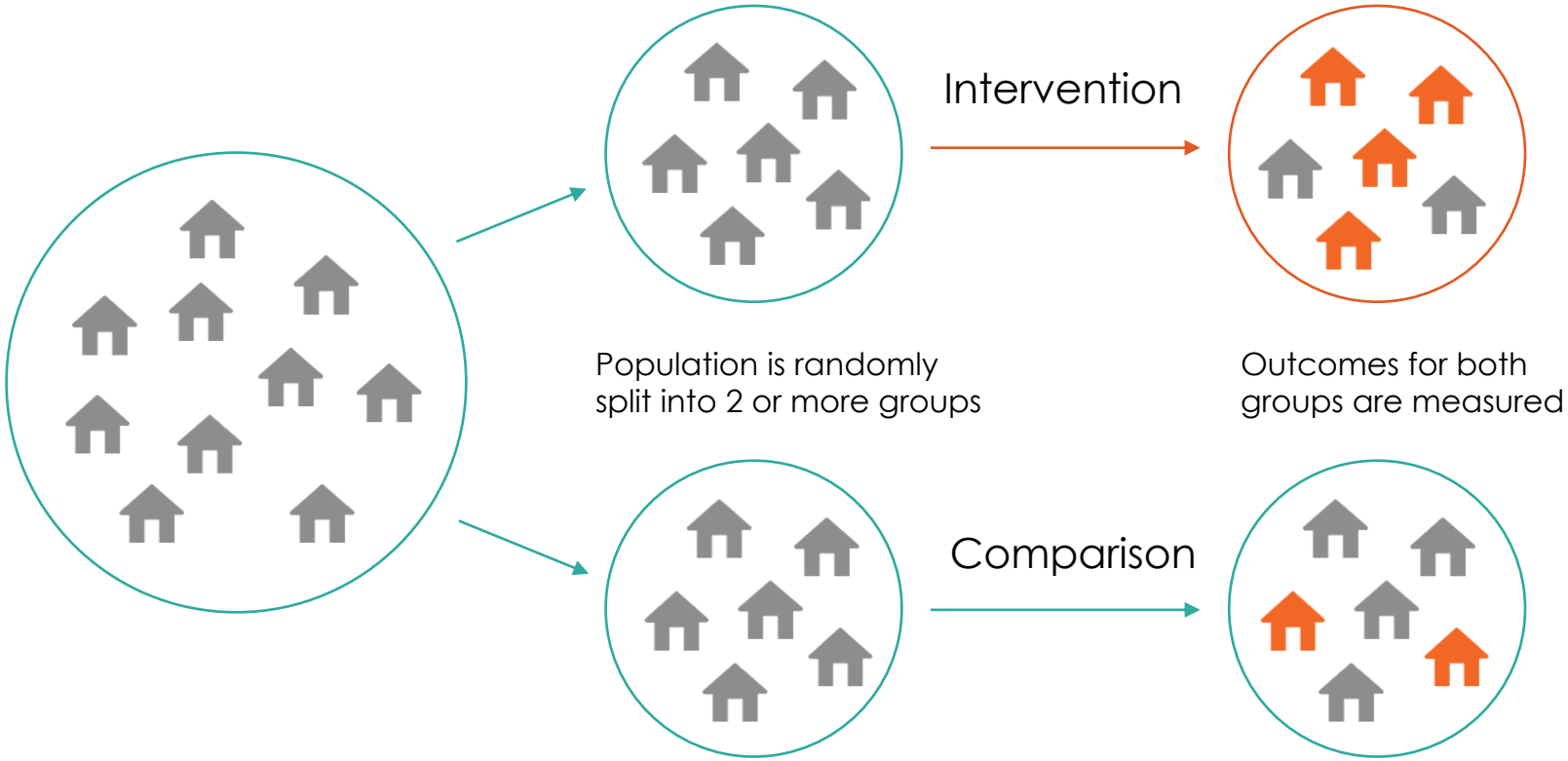
UKaid from the British people

Randomized evaluations provide a highly rigorous estimate of program impact

Before the program starts, eligible individuals are randomly assigned to two or more groups so that they are statistically identical before the program.



Two groups continue to be identical, except for treatment

Any differences in outcomes between the groups can be attributed to the program

Emerging insights on information and extension

- Information helps farmers assess novel technologies, their risk profile and potential profitability
- Getting extension right is particularly important in contexts where farmers are not familiar with the improved technology and may have limited access
- Extension can be effective when:
  - Introducing new or novel technologies
  - Revealing hidden qualities of technology
  - Mobilizing networks
  - Overcoming a behavioral bias
  - Providing accessible, tailored, and timely information

Why do farmers need information?

- Assessing a new agricultural technology is a fundamentally hard learning problem
- If a farmer is to use a new technology effectively they need to know:
  - That it **exists**
  - Something **about its benefits and costs**
  - How to **use it effectively**
- Learning is complicated by plot heterogeneity, input usage, and weather realizations
- Information helps famers assess novel technologies, their risk profile and potential profitability

Potentially big costs to ignoring training

Upland NERICA Rice introduced in Sierra Leone

- In villages where seeds coupled with extension, yields increased by 16%
- In villages where seeds were simply distributed, yields fell

Without extension, hard for farmers to learn about variety's yield potential, and necessary agronomic practices to reap benefits

Glennerster and Suri, forthcoming

Farmers are more likely to follow advice from **demonstrations that reflect their own characteristics**

Encourage social learning to expand reach

- (Much) extension relies centrally on social learning for the last mile
- Lots of good evidence that social learning happens in agriculture

Key question: How to design extension services to maximize social learning?

Ben Yishay et al. 2015, Beaman et al. 2015, Tjernstrom 2015, BenYishay and Mobarak 2013

Encourage social learning to expand reach

- The messenger(s) matters
  - Lead farmers most closely resembling target farmers may be more effective at promoting a new technology
  - A farmer is more likely to demand a new technology if a greater proportion of his/her network is demonstrating it

- Farmers need to be able to observe multiple data points
  - Need multiple demo plots or lead farmers per village
  - Intensity of exposure may be more important than equity

Ben Yishay et al. 2013, Beaman et al. 2015, Tjernstrom 2017, BenYishay and Mobarak 2017

Use **simple and accessible channels**, provide **timely guidance**, and **focus on important aspects that are difficult to observe**

Extension / information helps when learning is hard

Simple tools and messaging to aid learning

- Visual tools or physical aids to guide fertilizer application
- Information that highlights hard to observe traits
- Clear, tailored messages that match farmers technical knowledge

Hanna et al. 2012, Duflo et al. forthcoming, Islam 2014 . IMAGE: IRRI

Extension / information helps when farmers procrastinate

Timed nudges and guidance based on the planting cycle

- Large potential for ICTs
- Well-timed information delivery on agricultural activities
- Reminders to use inputs

Casaburi et al 2018; Casaburi and Kremer (forthcoming)

Harness ICT to reach farmers directly

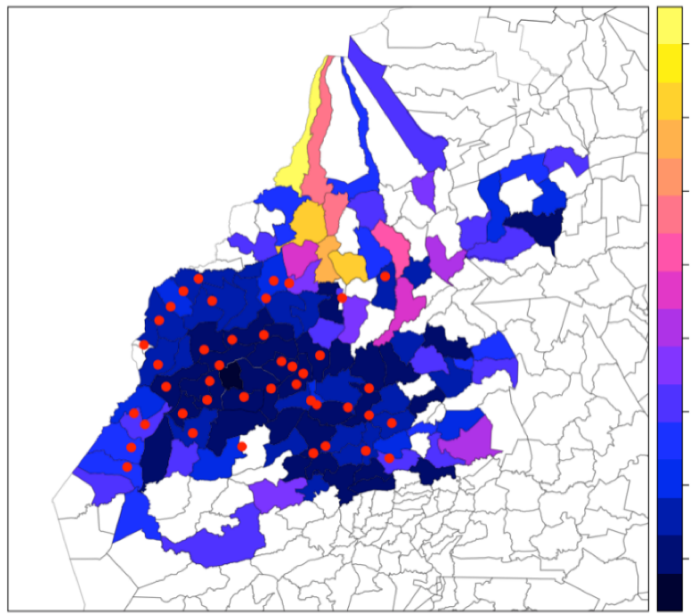
Mobile IVR extension in India (Awaaze.de)

- Hotline to ask agricultural experts questions, listen to other farmers' questions
- Weekly information and tips via automated voice message
- **High take up and use of mobile platform**
- **Farmers changed their sowing and input use decisions**
  - Switched to more effective pesticides
  - Increased adoption of cumin
  - Yield increases and (suggestive) profit gains for cotton and cumin
- **Cost-effective but low willingness to pay**
  - Estimated return of $10 per $1 spent

Cole and Fernando 2012, Cole and Fernando 2016

Precision Agriculture for Development (PAD)

- Founded by two ATAI affiliates; awarded funding for three projects
- Currently working in Kenya, Ethiopia, India, Pakistan, Ecuador
  - Scoping Uganda and Rwanda
  - Works with agriculture ministries, social enterprises, & NGOs
  - Refine and improve existing programs; develop new systems
- ICT extension, information, & alerts
- Soil health cards



Emerging insights on information and extension

- General extension is often ineffective
- Improved extension may be critical for new technology adoption
  - When technology is not readily understood
  - When adoption may be complicated by heterogeneity
- Extension may be improved through:
  - Using social networks and systematic selection of messengers to spread learnings
  - Introducing simple tools and messaging to encourage learning
  - Leveraging ICTs to provide timely, accurate information with greater reach

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Thank you!

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