Accelerating technical change through video-mediated agricultural extension: Evidence from Ethiopia

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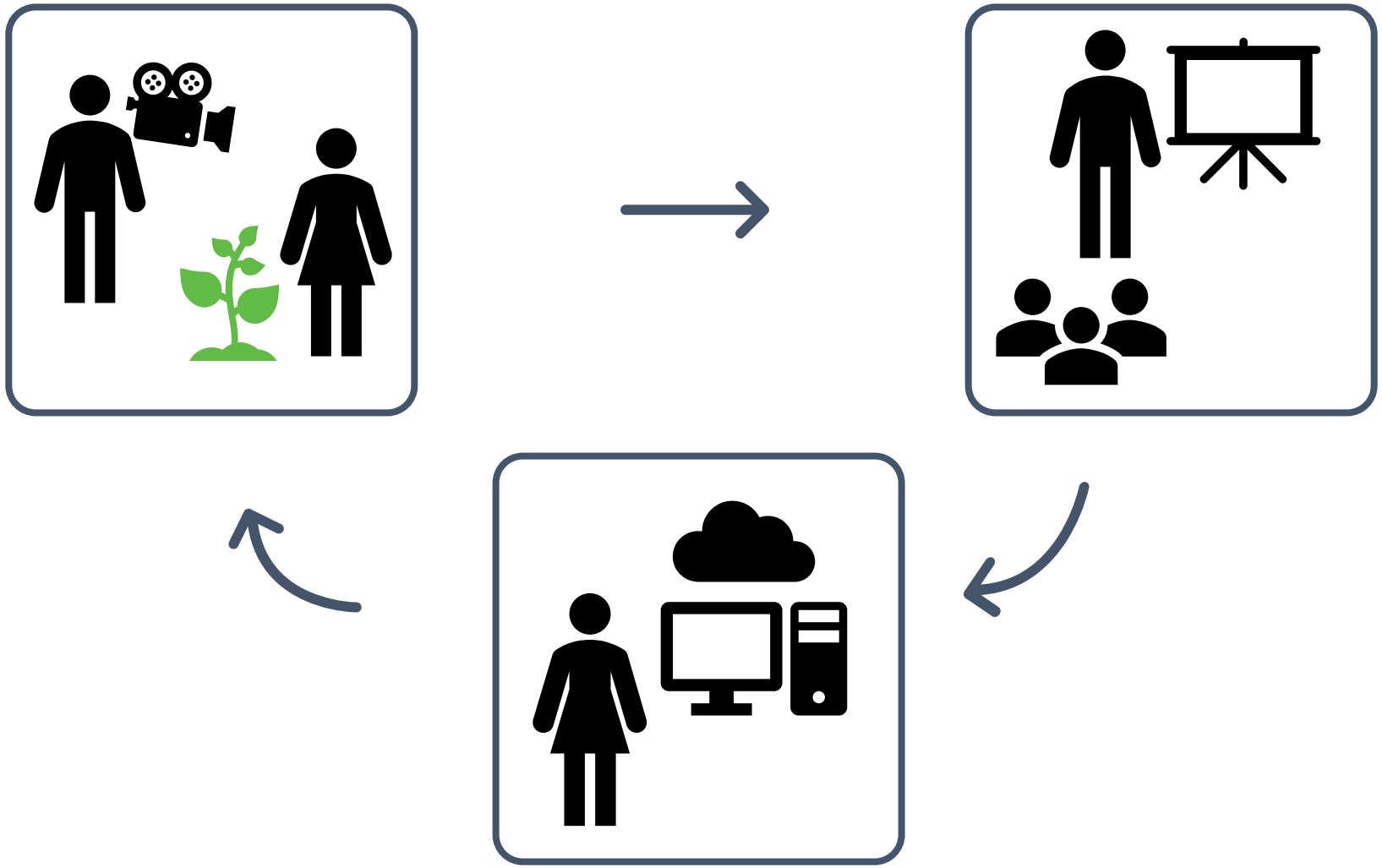
Motivation

- Video is a powerful medium – appealing, customized, consistent, low cost
  - Women's fertility and autonomy (Chong and La Ferrara 2009, Jensen and Oster 2009)
  - Financial literacy (Berg and Zia 2013)
  - HIV prevention (Banerjee et al. forthcoming)
  - Aspirations (Bernard et al. 2014)
- Limited evidence on the effectiveness of ICT-mediated extension
  - Need for more evidence on ICTs generally (Aker 2011; Nakasone and Torero 2016)
  - Video-based extension in India (Gandhi et al. 2007, Vasilaky et al. 2015)
- New opportunities to test video-mediated extension in Ethiopia
  - Since 2014, Digital Green and Govt. of Ethiopia have been piloting a video-mediated approach to extension
  - Evidence in support of ongoing reforms in Ethiopia's extension system

The Digital Green (DG) approach



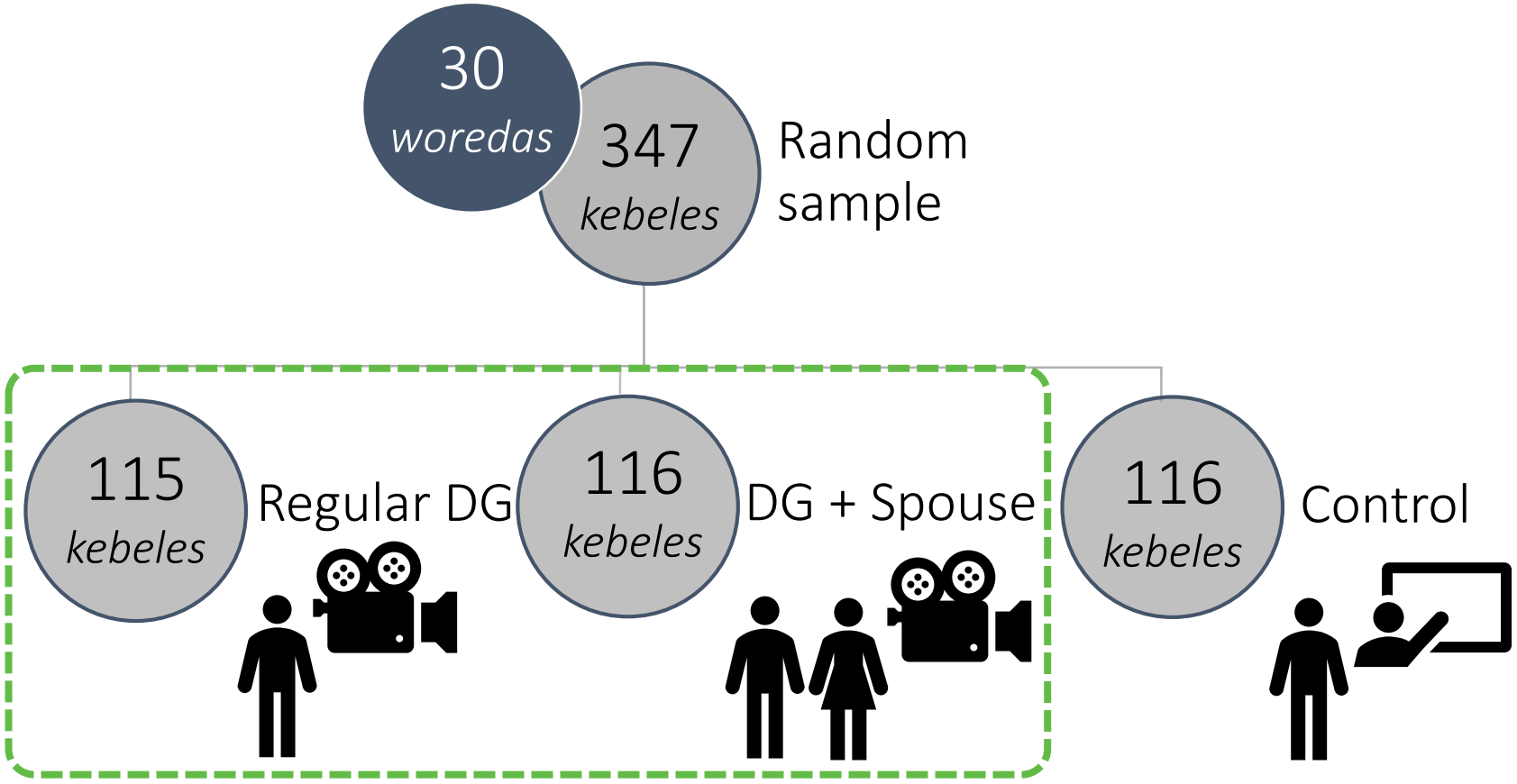
Research questions

1. Does video-mediated extension increase farmers' uptake of agricultural technologies?

2. Is video-mediated extension more effective when targeted at both spouses of the household (rather than the household head only)?

Experimental design

- Stratified, cluster RCT
- 4 regions of Ethiopia in 2017 *meher* (rainy) season
- Teff, wheat, maize
- Row planting, lower seeding rate, urea top dressing
- Screening at development group level



Experimental integrity

	Regular DG	DG + Spouse	Control
Compliance Development groups in which videos screened	57%	61%	6%
Uptake Farmer attended at least one video screening	41%	42%	4%

Balance

- The treatment and control groups are balanced on most time-invariant variables and baseline levels of primary outcome variables
- We control for imbalances wherever required

Empirical strategy

$$y_i = \alpha + \beta T_k + X_i'\delta + \mu_w + \varepsilon_i$$

Pooled treatment effect

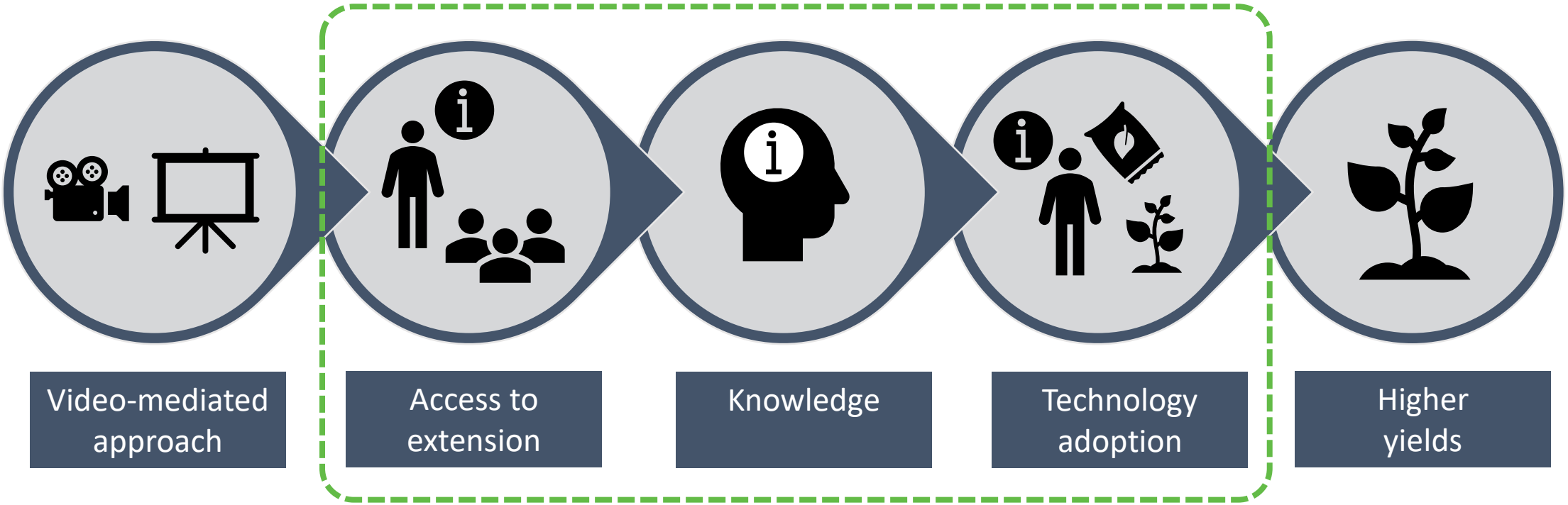
- y_i – level of outcome y measured at the household level i
- T_k – treatment status of *kebele* k where the household lives
- X – vector of household- and development group-level characteristics that account for baseline imbalances
- μ_w – *woreda*-level fixed effects that account for *woreda*-level stratification
- Standard errors clustered at the *kebele* level

$$y_i = \alpha + \beta^1 T_k^1 + \beta^2 T_k^2 + X_i'\delta + \mu_w + \varepsilon_i$$

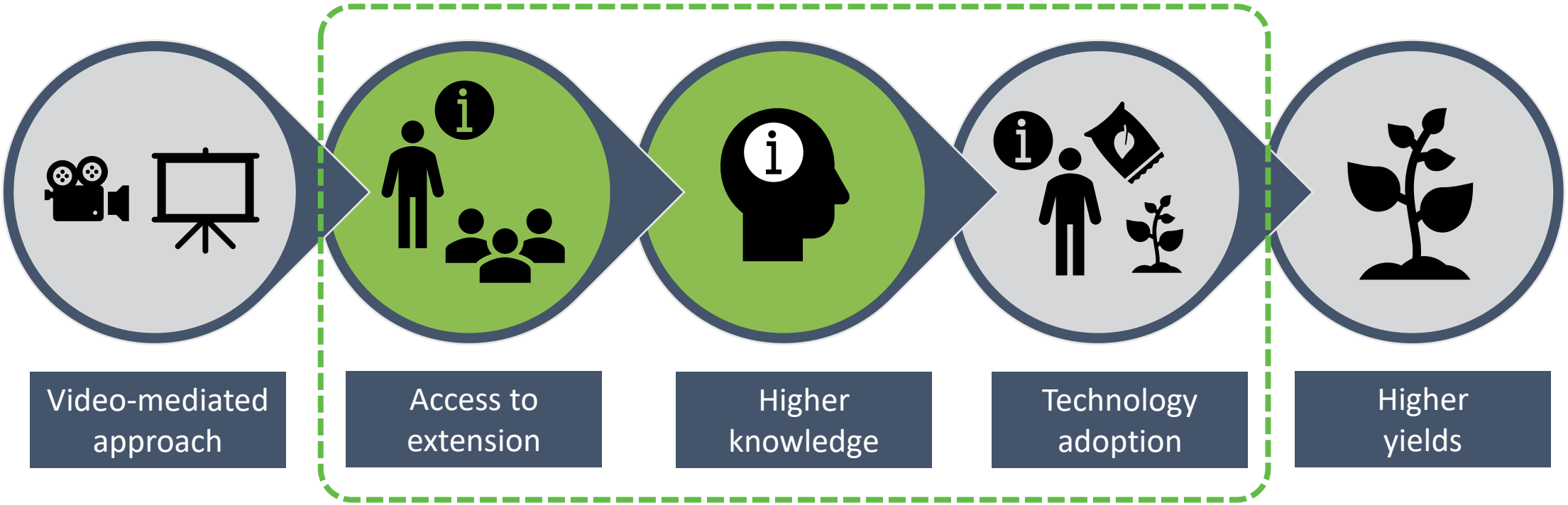
Differential treatment effects

- T_k^1 – Regular DG treatment
- T_k^2 – DG + spouse treatment

Impact pathway



Impact pathway



Access to DA advice

	Teff		Wheat		Maize	
	Advice provided	Frequency	Advice provided	Frequency	Advice provided	Frequency
Pooled DG treatment	0.108***	0.381***	0.156***	0.557***	0.124***	0.430***
	(0.0243)	(0.111)	(0.0247)	(0.103)	(0.0270)	(0.114)
Increase over control	24%	30%	37%	48%	25%	29%
Control mean	0.453	1.285	0.425	1.162	0.497	1.466
Observations	1,540	1,540	1,492	1,492	1,332	1,332
R-squared	0.341	0.263	0.371	0.291	0.350	0.288

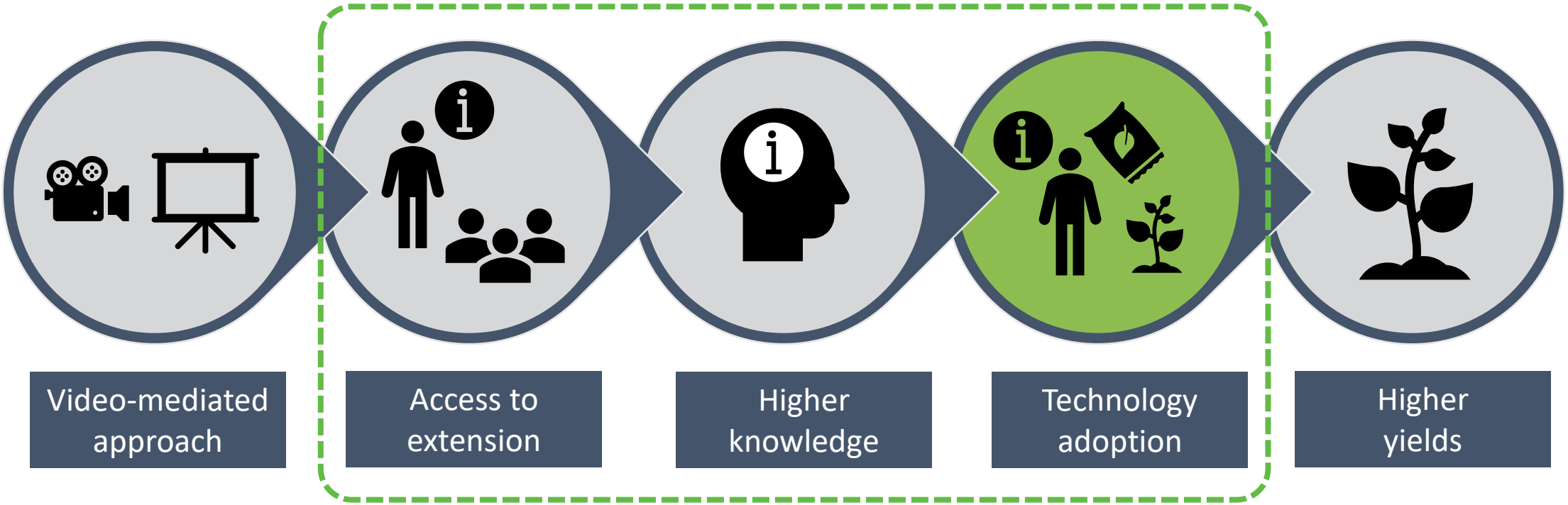
Note: Robust, clustered SEs, district FE, controls for baseline imbalance and distance to FTC

Agricultural knowledge

	Teff	Wheat	Maize
	Score (percent)	Score (percent)	Score (percent)
Pooled DG treatment	1.808***	1.144	0.939
	(0.684)	(0.795)	(0.748)
Increase over control	5%		
Control mean	37.455	38.289	43.750
Observations	1,540	1,492	1,332
R-squared	0.176	0.135	0.209

Note: Robust, clustered SEs, district FE, controls for baseline imbalance and distance to FTC

Impact pathway



Adoption

	Row Planting	Lower seeding rate	Urea top dressing
Pooled DG treatment	0.0426**	0.0782***	0.0693***
	(0.0206)	(0.0214)	(0.0201)
Increase over control	10%	19%	14%
Control mean	0.437	0.413	0.493
Observations	2,422	2,422	2,422
R-squared	0.422	0.165	0.304

Adoption, row planting

	Teff		Wheat		Maize	
	Row planted	% area row planted	Row planted	% area row planted	Row planted	% area row planted
Pooled DG treatment	0.0576***	0.0673***	0.0340	0.0529**	0.0355*	0.00345
	(0.0215)	(0.0182)	(0.0224)	(0.0222)	(0.0205)	(0.0217)
Increase over control	36%	48%		23%	5%	
Control mean	0.160	0.140	0.230	0.226	0.650	0.795
Observations	1,540	1,540	1,492	1,492	1,332	1,332
R-squared	0.457	0.463	0.448	0.531	0.398	0.371

Note: Robust, clustered SEs, district FE, controls for baseline imbalance and distance to FTC

Adoption, lower seed rate

	Teff	Wheat	Maize
	Lower seeding rate	Lower seeding rate	Lower seeding rate
Pooled DG treatment	0.0697***	0.0857***	0.0336
	(0.0266)	(0.0259)	(0.0264)
Increase over control	22%	34%	
Control mean	0.311	0.255	0.436
Observations	1,540	1,492	1,332
R-squared	0.173	0.172	0.198

Note: Robust, clustered SEs, district FE, controls for baseline imbalance and distance to FTC

Adoption, urea side dressing

	Teff	Wheat	Maize
	Urea side dressing	Urea side dressing	Urea side dressing
Pooled DG treatment	0.0815***	0.0900***	0.0316
	(0.0239)	(0.0259)	(0.0208)
Increase over control	22%	23%	
Control mean	0.371	0.390	0.506
Observations	1,540	1,487	1,332
R-squared	0.287	0.244	0.439

Note: Robust, clustered SEs, district FE, controls for baseline imbalance and distance to FTC

Conclusion and next steps

- The DG video-mediated extension approach
  - Increased extension coverage in targeted kebeles
  - Improved farmers' knowledge about focal technologies/practices, teff
  - Increased adoption of focal technologies/practices
  - Lends support to the Government's ongoing extension reforms
- Year 2
  - Persistence of impacts
  - Impact on yields

Thank you

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forum mondial pour le conseil rural
foro global para los servicios de asesoría rural

Adoption, row planting

	Teff		Wheat		Maize	
	Row planted	% area row planted	Row planted	% area row planted	Row planted	% area row planted
DG + spouse	0.0547**	0.0643***	0.0297	0.0555**	0.0297	0.000290
	(0.0241)	(0.0209)	(0.0238)	(0.0246)	(0.0233)	(0.0258)
Reg DG	0.0604**	0.0702***	0.0363	0.0503*	0.0414*	0.00671
	(0.0241)	(0.0200)	(0.0277)	(0.0259)	(0.0248)	(0.0248)
Test of equality (F)	0.07	0.1	0.07	0.05	0.22	0.06
Test of equality (Prob > F)	0.7952	0.7544	0.7987	0.8287	0.6407	0.8074
Control mean	0.160	0.140	0.230	0.226	0.650	0.795
Observations	1,540	1,540	1,492	1,492	1,332	1,332
R-squared	0.457	0.463	0.45	0.531	0.398	0.371

Adoption, lower seeding rate

	Teff	Wheat	Maize
	Lower seeding rate	Lower seeding rate	Lower seeding rate
DG + Spouse	0.0639**	0.0908***	0.0331
	(0.0306)	(0.0297)	(0.0296)
Regular DG	0.0755**	0.0826***	0.0341
	(0.0305)	(0.0311)	(0.0312)
Test of equality (F)	0.15	0.07	0
Test of equality (Prob > F)	0.696	0.7935	0.9737
Control mean	0.311	0.255	0.436
Observations	1,540	1,492	1,332
R-squared	0.173	0.173	0.198

Adoption, urea top dressing

	Teff	Wheat	Maize
	Urea top dressing	Urea top dressing	Urea top dressing
DG + spouse	0.0887***	0.0741**	0.0250
	(0.0292)	(0.0292)	(0.0248)
Regular DG	0.0744***	0.0975***	0.0385
	(0.0266)	(0.0303)	(0.0253)
Test of equality (F)	0.25	0.66	0.23
Test of equality (Prob > F)	0.6205	0.4174	0.6318
Control mean	0.371	0.389	0.506
Observations	1,540	1,492	1,332
R-squared	0.287	0.240	0.439