The Impact Evaluation of the SHEP Program in Kenya

Satoshi Shimizutani

JICA Ogata Research Institute

Original article

- Satoshi Shimizutani (JICA), Shimpei Taguchi (JICA), Eiji Yamada (JICA) and Hiroyuki Yamada (Keio) (2022). "The Impact of "Grow to Sell" Agricultural Extension on Smallholder Horticulture Farmers: Evidence from a Market-Oriented Approach in Kenya."
- Full paper is available at https://ies.keio.ac.jp/en/publications/14828/
- The views expressed in the article and the presentation are personal and do not represent those of JICA.
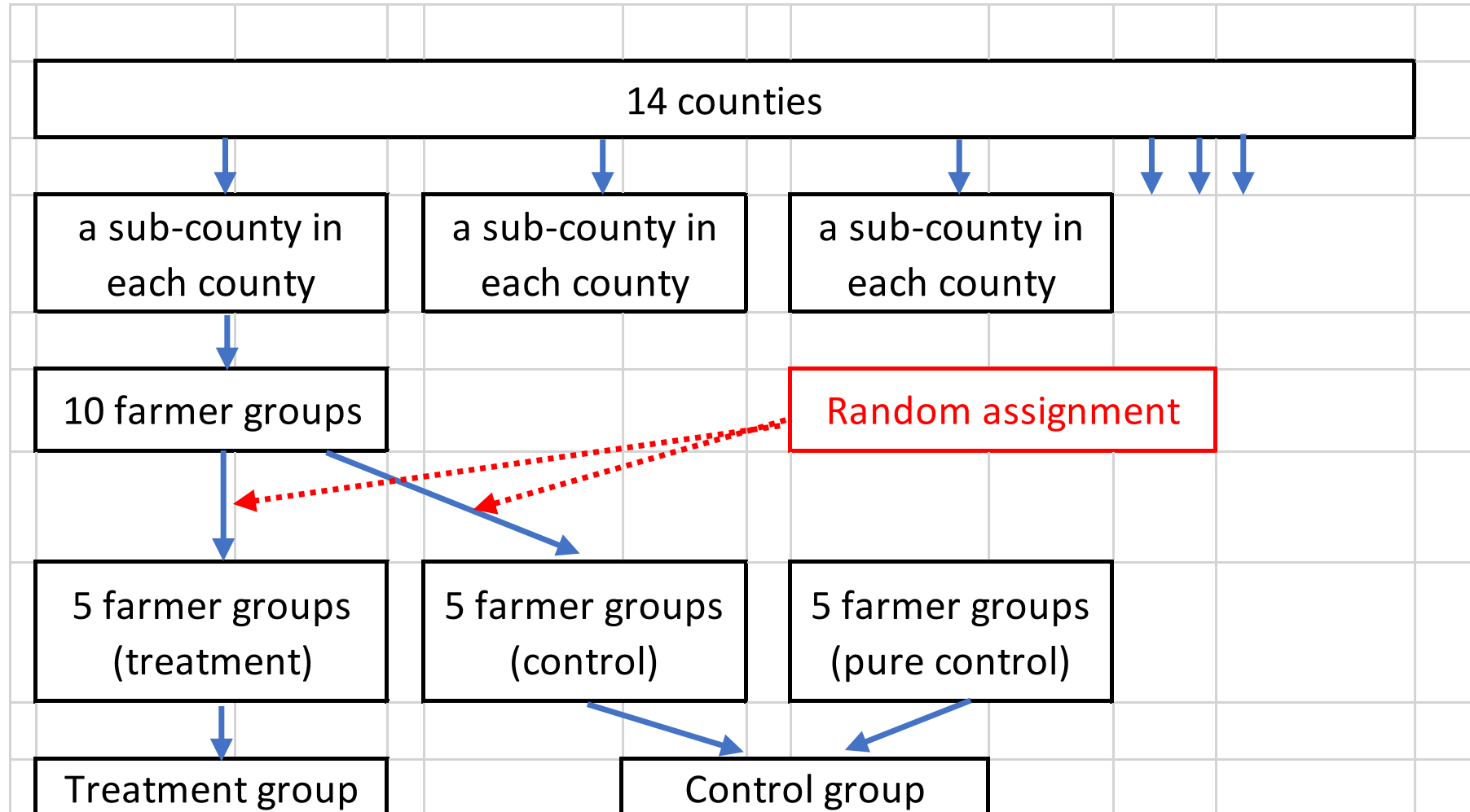
Outline of the paper

- First evidence on the impact of the SHEP (Smallholder Horticulture Empowerment and Promotion) program in Kenya.

- Large scale RCT (Randomized Controlled Trial) over two years to evaluate the SHEP impact.

- Expected and unexpected results.

Research design (1) RCT

- Third phase of SHEP ("SHEP PLUS": Smallholder Horticulture Empowerment and Promotion Project for Local and Up-scaling) in 2015-2019.
- 14 counties in Kenya: one sub-county in each county.
- 10 farmer groups are selected in a sub-county as potential beneficiary groups.
- Randomly assigned to "treatment" group (5) and "control" group (5) in a sub-county (Randomized Controlled Trial: RCT)
- In addition, 5 groups in a neighboring sub-county with similar characteristics ("pure control group")
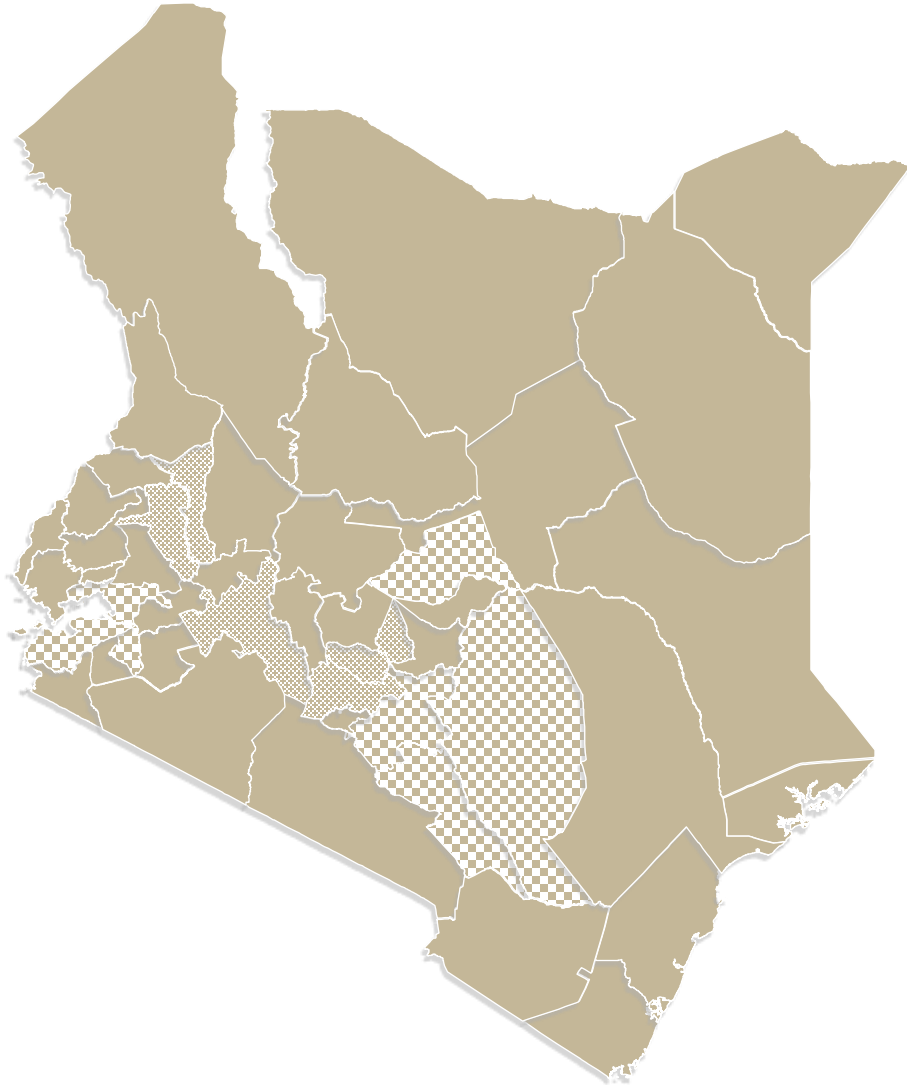
Research Design (2) Selection process

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│                        14 counties                          │
└─────────────────────────────────────────────────────────────┘
         │                    │                    │        │ │ │
         ▼                    ▼                    ▼        ▼ ▼ ▼
┌──────────────────┐ ┌──────────────────┐ ┌──────────────────┐
│  a sub-county in │ │  a sub-county in │ │  a sub-county in │
│    each county   │ │    each county   │ │    each county   │
└──────────────────┘ └──────────────────┘ └──────────────────┘
         │
         ▼
┌──────────────────┐              ┌──────────────────────────┐
│ 10 farmer groups │              │   Random assignment      │
└──────────────────┘              └──────────────────────────┘
    │
    ▼
┌──────────────────┐ ┌──────────────────┐ ┌──────────────────┐
│  5 farmer groups │ │  5 farmer groups │ │  5 farmer groups │
│    (treatment)   │ │    (control)     │ │   (pure control) │
└──────────────────┘ └──────────────────┘ └──────────────────┘
         │                    │                    │
         ▼                    ▼                    ▼
┌──────────────────┐        ┌──────────────────────────┐
│ Treatment group  │        │      Control group       │
└──────────────────┘        └──────────────────────────┘
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Research Design (3) Impact evaluation
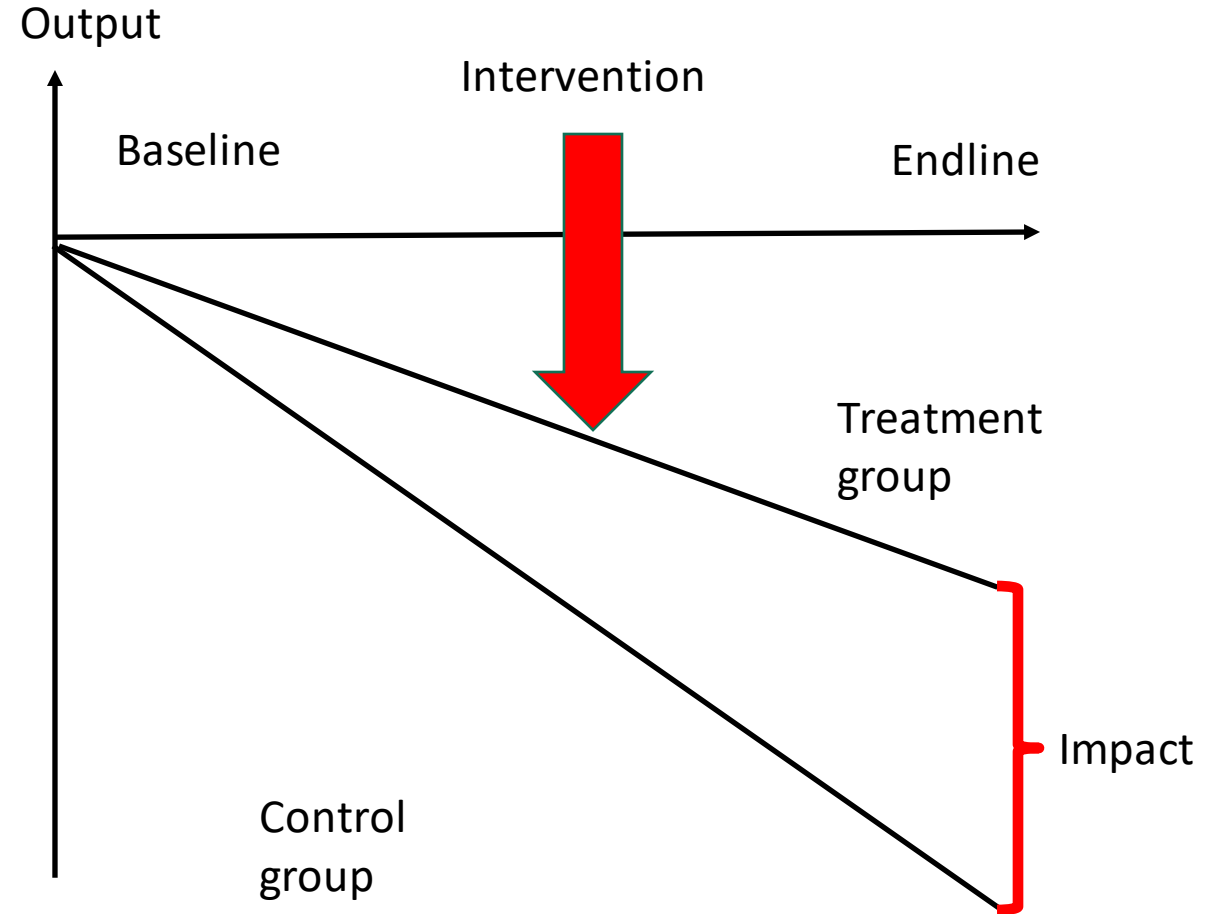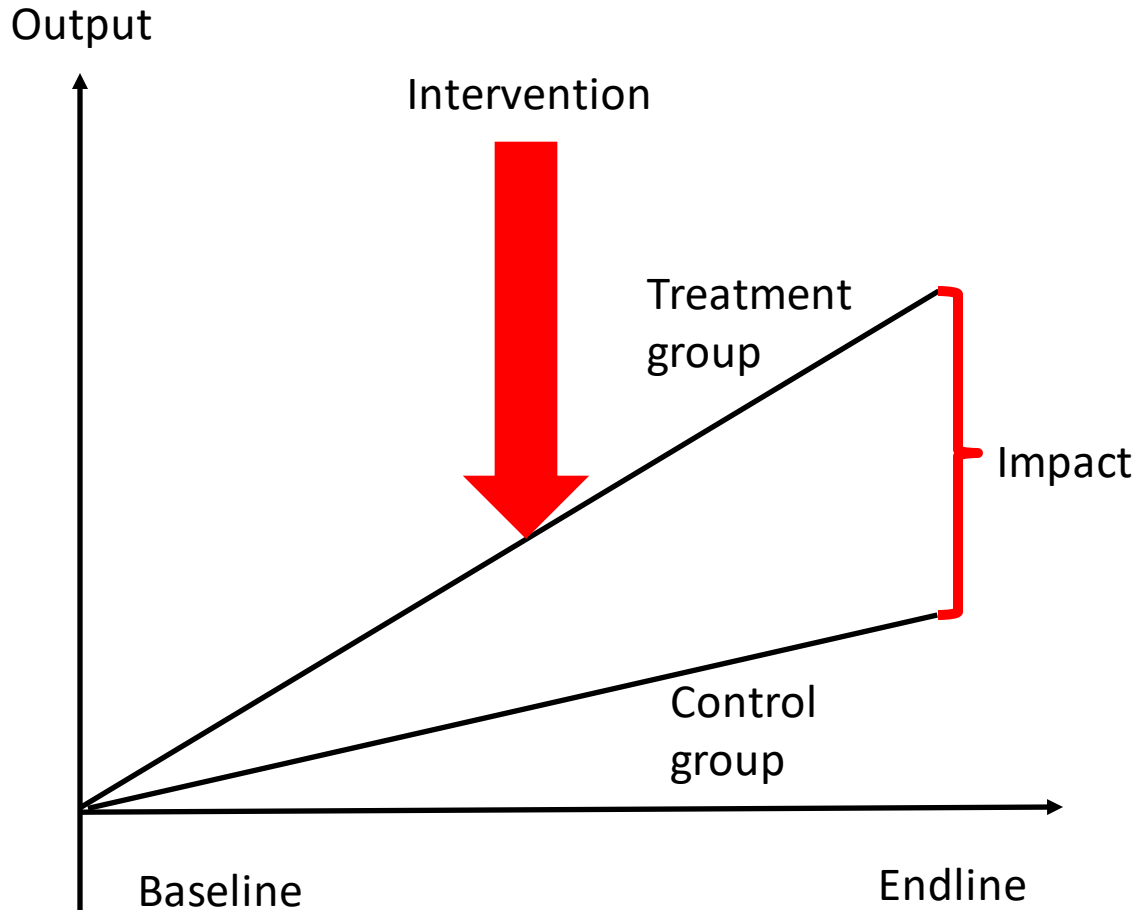
Study areas

Batch 1 Counties
 Elgeyo-Marakwet
 Kiambu
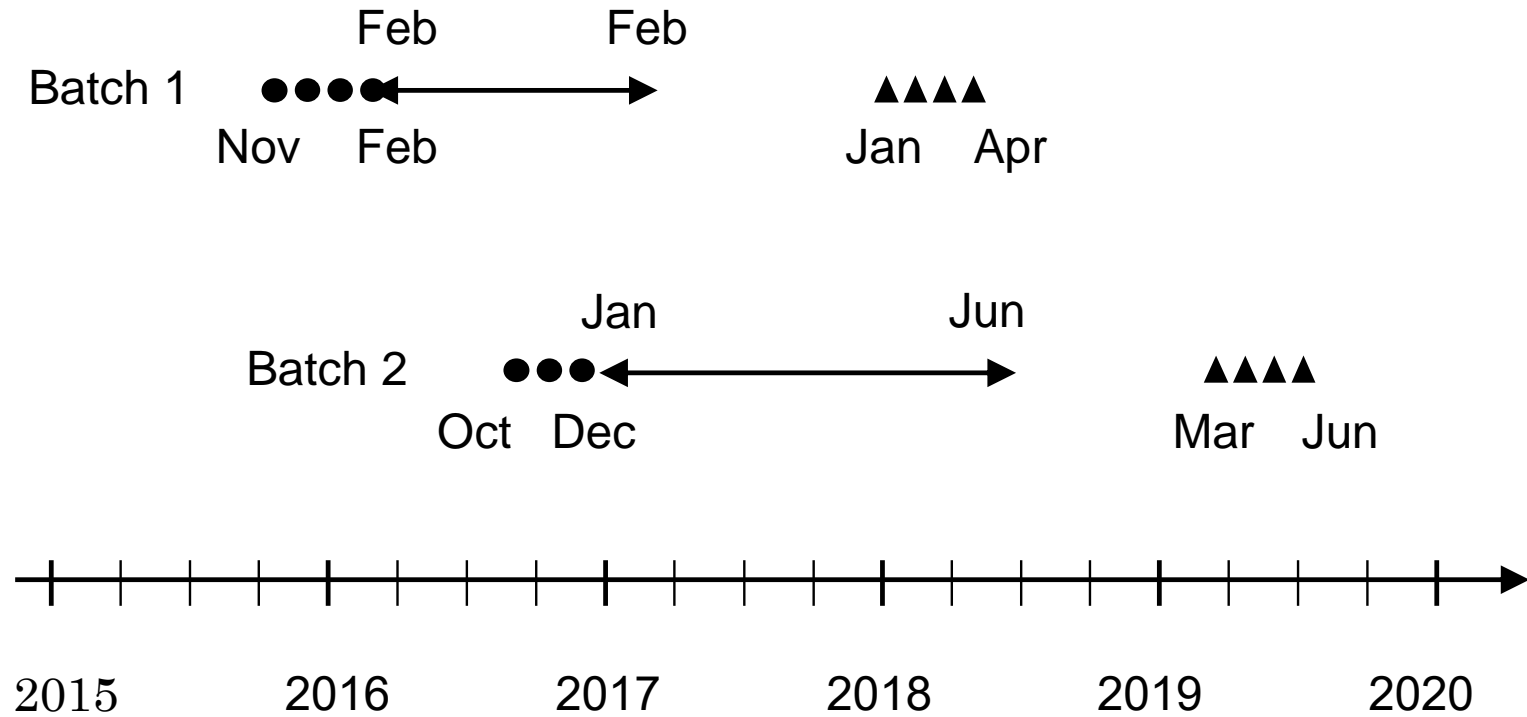 Kirinyaga
 Muranga
 Nakuru
 Uasin-Gishu

Batch 2 Counties
 Embu
 Homa Bay
 Kisumu
 Kitui
 Machakos
 Makueni
 Meru
 Nyamira

Timeline

(note) "follow-up" refers to "endline".

Balance test

- <u>No significant difference</u> between treatment and control group at the baseline survey (before receiving SHEP training) in terms of

1. Crop sales (total, horticulture), household consumption, assets (farming, livestock, total)

2. Agricultural activities (total costs, fertilizer, pesticide, chemical, seeds purchased, transportation, labor inputs)

3. Household characteristics (family size, age and gender of head of household etc.)

Empirical Specification

- $Y_{ij1} = \alpha + \boxed{\beta D_i} + \epsilon_{ij}$ (1)

- $Y_{ij1} = \alpha + \boxed{\beta D_i} + \theta Y_{ij0} + \epsilon_{ij}$ (2)

- $\Delta Y_i = \alpha + \boxed{\beta D_i} + \Delta \epsilon_i$ (3)

- $Y_{ijt} = \alpha + \boxed{\beta (D_i \times POST_t)} + \gamma POST_t + \delta D_i + \epsilon_{ijt}$ (4)

- $Y_{ijt} = \alpha + \boxed{\beta (D_i \times POST_t)} + \gamma POST_t + \delta D_i + \zeta SC_j + \epsilon_{ijt}$ (5)

Y_{ijt}: Outcomes (i : HH, j : sub-county, t : 0 (baseline) or 1(endline))

D_i: 0 (control group) or 1 (treatment group)

$POST_t$: 0 (baseline) or 1 (endline)

Impact on main outcomes (1)

	(1) Difference at endline	(2) with lag	(3) First difference	(4) Difference in difference	(5) Difference in difference with covariates
Total sales of crops (log)	0.352	0.311	0.226	0.226	0.228
	[0.370]	[0.299]	[0.291]	[0.292]	[0.294]
Total sales of horticultural crops (log)	0.682	0.676**	0.664**	0.664*	0.673**
	[0.413]	[0.342]	[0.337]	[0.337]	[0.341]
Household annual aggregate consumption (log)	0.025	0.014	-0.004	-0.004	0.003
	[0.048]	[0.044]	[0.045]	[0.045]	[0.044]
Annual aggregate consumption per capita (log)	0.034	0.018	0.001	0.001	-0.012
	[0.052]	[0.046]	[0.047]	[0.047]	[0.047]
Total farming assets (log)	0.006	-0.134	-0.232	-0.232	-0.205
	[0.331]	[0.178]	[0.148]	[0.149]	[0.150]
Total livestock assets (log)	0.097	0.062	0.022	0.022	0.036
	[0.138]	[0.101]	[0.108]	[0.108]	[0.110]
Household assets purchased in last one year (log)	0.144	0.144	0.150	0.150	0.153
	[0.197]	[0.197]	[0.211]	[0.211]	[0.210]
Household assets (current Value)	-0.105	-0.077	-0.058	-0.058	-0.066
	[0.275]	[0.172]	[0.182]	[0.182]	[0.179]
Number of observations	3,177	3,177	3,177	6,354	6,354

Impact on main outcomes (2)

- The coefficients on horticultural crop sales are positive and statistically significant (except (1)).
- The treatment group enjoyed larger horticultural sales than the control group <u>by 70% on average (=30% annually)</u>.
- <u>"Intention-to-treat" (ITT)</u> estimate: not all took SHEP training.
- No significant impact on total crop sales or household consumption/assets.
- Smaller share of horticultural sales (20-25%) and/or huge measurement errors.

Impact on farming activities

- Positive and significant effects on total agricultural inputs (60%), fertilizer costs (70-80% in (1) and (2)), pesticide costs (50%) and purchased seeds (60-70%) <u>for horticultural crops</u>.

- The increase in horticultural crop sales is associated with larger agricultural inputs into horticultural crops.

- No significant impact on farming activities for all crops.

Impact on horticultural sales by subgroup (1)

- Gender: positive and significant for <u>female-headed</u> households (122% (2.2 times)).

- Education: positive and significant for households whose head is <u>less educated</u> (less than junior secondary school) (71%).

- Age: positive and significant for households whose head is <u>older</u> (94%).

- Past experience: <u>comparable</u> impact between households with and without horticultural sales at baseline.

Impact on horticultural sales by subgroup (2)

- Positive and significant impact on horticultural income is pronounced for <u>"vulnerable" households</u> whose head is female, less educated, or older, but it is irrelevant to having any market experience prior to the intervention.

- Successful "<u>humanized agricultural extension</u>" focusing on autonomy of farmers in context of social, cultural and political factors.

Effects of each training activity

- 16% of households in the control group are familiar with SHEP: Complier Average Causal Effect (or LATE).
- Group exercise activities (market survey etc.) : 103% increase in horticultural sales.
- Farm Business Linkage Stakeholder Forum (FABLIST) : 128%
- Gender mainstreaming training : 112%
- At least one activity : 86%
- Positive impact of the SHEP program on horticultural income is larger among compliers.

Take-home messages

- <u>SHEP works</u>: SHEP improves horticultural income by 70% over 2 years on average.

- <u>SHEP is for all</u>: effective for vulnerable farmers (head of household was female, less educated and older) and irrelevant to horticultural experience, contrasting to the "common sense" of traditional agricultural extension.

- <u>SHEP rallies power of activities</u>: Farm Business Linkage Stakeholder Forum and Gender Mainstreaming Training play an important role together with group exercises.

Thank you!