# **EVANS SCHOOL OF PUBLIC AFFAIRS**

UNIVERSITY of WASHINGTON

Evans School Policy Analysis and Research (EPAR)

#### LSMS - INTEGRATED SURVEYS ON AGRICULTURE UNITED REPUBLIC OF TANZANIA: INPUT APPENDIX

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#### Appendix: LSMS-ISA: Inputs

The tables below provide the details for analysis done in EPAR Brief #179, including 95% confidence intervals, the number of observations, and p-values where available.

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### National Input Use Rates

National Proportion of Households Using Agricultural Inputs			
Input Type	Estimated Proportion	95% C.I.	Observations
Organic Fertilizer	22%	[19%, 25%]	431 out of 2216
Inorganic Fertilizer	13%	[10%, 16%]	305 out of 2216
Pesticides, Herbicides, or Fungicides	15%	[12%, 17%]	329 out of 2216
IV Seed	22%	[19%, 24%]	429 out of 2140

#### Zonal Input Use Rates

Proportion of Households Using Organic fertilizer by Zone			
Zone	Estimated Proportion	95% C.I.	Observations
Central	33%	[23%, 44%]	44 out of 134
Eastern	5%	[2%, 7%]	17 out of 173
Southern Highlands	24%	[17%, 32%]	78 out of 336
Lake	22%	[15%, 28%]	52 out of 240
Northern	34%	[24%, 44%]	114 out of 324
Southern	8%	[4%, 11%]	34 out of 438
Western	22%	[17%, 27%]	66 out of 317
Zanzibar	11%	[6%, 16%]	26 out of 254

Proportion of Households Using Improved Seeds by Zone			
Zone	Estimated Proportion	95% C.I.	Observations
Central	19%	[9%, 28%]	26 out of 134
Eastern	20%	[14%, 26%]	35 out of 168
Southern Highlands	19%	[13%, 25%]	61 out of 331
Lake	20%	[13%, 26%]	44 out of 232
Northern	39%	[30%, 47%]	124 out of 319
Southern	9%	[6%, 12%]	41 out of 414
Western	22%	[16%, 28%]	66 out of 313
Zanzibar	14%	[8%, 19%]	32 out of 229

Proportion of Households Using Inorganic fertilizer by Zone			
Zone	Estimated Proportion	95% C.I.	Observations
Central	6%	[-2%, 13%]	8 out of 134
Eastern	5%	[0%, 11%]	10 out of 173
Southern Highlands	34%	[24%, 43%]	118 out of 336
Lake	1%	[0%, 2%]	3 out of 240
Northern	15%	[6%, 23%]	46 out of 324
Southern	18%	[10%, 25%]	73 out of 438
Western	7%	[3%, 12%]	25 out of 317
Zanzibar	8%	[4%, 12%]	22 out of 254

Proportion of Households Using Pesticides, Herbicides or Fungicides by Zone			
Zone	Estimated Proportion	95% C.I.	Observations
Central	6%	[-2%, 13%]	8 out of 134
Eastern	5%	[0%, 11%]	19 out of 173
Southern Highlands	34%	[24%, 43%]	74 out of 336
Lake	1%	[0%, 2%]	18 out of 240
Northern	15%	[6%, 23%]	70 out of 324
Southern	18%	[10%, 25%]	88 out of 438
Western	7%	[3%, 12%]	43 out of 317
Zanzibar	8%	[4%, 12%]	9 out of 254

### Regional Input Use Rates

Proportion of Households Using Organic Fertilizer by Region			
Region	Estimated Proportion	95% C.I.	Observations
Manyara	37%	[13%, 61%]	24 out of 62
Arusha	26%	[12%, 41%]	17 out of 64
Kilimanjaro	54%	[38%, 70%]	54 out of 99
Tanga	18%	[2%, 34%]	19 out of 99
Tabora	16%	[8%, 25%]	16 out of 102
Kigoma	15%	[6%, 23%]	13 out of 93
Shinyanga	31%	[24%, 38%]	37 out of 122
Morogoro	2%	[-1%, 4%]	2 out of 88
Pwani	6%	[0%, 12%]	3 out of 49
Dar es Salaam	34%	[15%, 54%]	12 out of 36
Kagera	18%	[7%, 29%]	20 out of 110
Mwanza	22%	[14%, 31%]	20 out of 88
Mara	29%	[19%, 39%]	12 out of 42
Iringa	27%	[16%, 38%]	30 out of 116
Mbeya	25%	[12%, 37%]	33 out of 140
Rukwa	21%	[4%, 38%]	15 out of 80
Singida	44%	[27%, 62%]	21 out of 47
Dodoma	28%	[15%, 41%]	23 out of 87
North Zanzibar	10%	[0%, 20%]	6 out of 60
Urban West Zanzibar	10%	[5%, 16%]	4 out of 38
North Pemba	9%	[0%, 18%]	6 out of 65
South Pemba	2%	[-1%, 4%]	1 out of 70
Lindi	3%	[0%, 5%]	4 out of 137
Mtwara	6%	[3%, 10%]	12 out of 168
Ruvuma	13%	[5%, 20%]	18 out of 133

Proportion of Households Using IV Seed by Region			
Region	Estimated Proportion	95% C.I.	Observations
Manyara	24%	[6%, 42%]	15 out of 62
Arusha	41%	[25%, 57%]	27 out of 64
Kilimanjaro	61%	[50%, 71%]	50 out of 96
Tanga	24%	[10%, 38%]	24 out of 97
Tabora	24%	[14%, 34%]	24 out of 101
Kigoma	5%	[0%, 10%]	4 out of 90
Shinyanga	32%	[24%, 40%]	38 out of 122
Morogoro	16%	[12%, 19%]	14 out of 88
Pwani	30%	[17%, 43%]	14 out of 48
Dar es Salaam	23%	[5%, 40%]	7 out of 32
Kagera	5%	[0%, 10%]	6 out of 108
Mwanza	35%	[25%, 46%]	30 out of 86
Mara	21%	[10%, 31%]	8 out of 38
Iringa	19%	[8%, 30%]	22 out of 112
Mbeya	24%	[14%, 33%]	31 out of 139
Rukwa	9%	[1%, 16%]	8 out of 80
Singida	25%	[6%,45%]	12 out of 47
Dodoma	16%	[6%, 26%]	14 out of 87
North Zanzibar	15%	[4%, 26%]	10 out of 61
Urban West Zanzibar	12%	[4%, 20%]	4 out of 30
North Pemba	9%	[2%, 16%]	5 out of 56
South Pemba	23%	[9%, 36%]	13 out of 64
Lindi	14%	[9%, 19%]	19 out of 136
Mtwara	10%	[4%, 16%]	16 out of 147
Ruvuma	4%	[1%, 8%]	6 out of 131

Proportion of Households Using Inorganic Fertilizer by Region			
Region	Estimated Proportion	95% C.I.	Observations
Manyara	0	-	0 out of 62
Arusha	11%	[-6%, 28%]	6 out of 64
Kilimanjaro	32%	[14%, 49%]	31 out of 99
Tanga	8%	[-6%, 22%]	9 out of 99
Tabora	15%	[3%, 26%]	14 out of 102
Kigoma	6%	[-1%, 12%]	6 out of 93
Shinyanga	4%	[-1%, 8%]	5 out of 122
Morogoro	3%	[0%, 7%]	3 out of 88
Pwani	9%	[-8%, 27%]	4 out of 49
Dar es Salaam	8%	[1%, 16%]	3 out of 36
Kagera	1%	[-1%, 19%]	1 out of 110
Mwanza	2%	[-2%, 5%]	2 out of 88
Mara	0%	-	0 out of 42
Iringa	49%	[33%, 64%]	61 out of 116
Mbeya	33%	[18%, 49%]	47 out of 140
Rukwa	11%	[-1%, 22%]	10 out of 80
Singida	17%	[-3%, 37%]	8 out of 47
Dodoma	0%	-	0 out of 87
North Zanzibar	8%	[-2%, 18%]	5 out of 60
Urban West Zanzibar	7%	[0%, 14%]	3 out of 38
North Pemba	5%	[1%, 10%]	4 out of 65
South Pemba	13%	[5%, 20%]	9 out of 70
Lindi	4%	[1%, 6%]	5 out of 137
Mtwara	7%	[2%, 12%]	13 out of 168
Ruvuma	40%	[23%, 56%]	55 out of 133

Proportion of Households Using Pesticide, Herbicide or Fungicide by Region			
Region	Estimated Proportion	95% C.I.	Observations
Manyara	12%	[5%, 18%]	7 out of 62
Arusha	23%	[9% ,37%]	14 out of 64
Kilimanjaro	40%	[28%,51%]	39 out of 99
Tanga	9%	[-3%, 21%]	10 out of 99
Tabora	19%	[7%, 31%]	20 out of 102
Kigoma	4%	[0%, 9%]	4 out of 93
Shinyanga	15%	[7%, 22%]	19 out of 122
Morogoro	8%	[0%, 17%]	7 out of 88
Pwani	22%	[7%, 36%]	10 out of 49
Dar es Salaam	7%	[-3%, 16%]	2 out of 36
Kagera	4%	[0%, 9%]	5 out of 110
Mwanza	6%	[-1%, 13%]	6 out of 88
Mara	16%	[-1%, 32%]	7 out of 42
Iringa	32%	[19%,45%]	37 out of 116
Mbeya	20%	[9%, 31%]	29 out of 140
Rukwa	11%	[-4%, 26%]	8 out of 80
Singida	17%	[0%, 34%]	8 out of 47
Dodoma	0%	-	0 out of 87
North Zanzibar	5%	[0%, 9%]	3 out of 60
Urban West Zanzibar	6%	[0%, 12%]	2 out of 38
North Pemba	0%	-	0 out of 65
South Pemba	5%	[-1%, 11%]	3 out of 70
Lindi	19%	[9%, 28%]	27 out of 137
Mtwara	26%	[18%, 34%]	44 out of 168
Ruvuma	14%	[1%, 26%]	70 out of 133

Proportion of Households Using Pesticide, Herbicide, Fungicide, or any Fertilizer by Region			
Region	Estimated Proportion	95% C.I.	Observations
Manyara	42%	[19%, 65%]	27 out of 62
Arusha	38%	[21%, 55%]	24 out of 64
Kilimanjaro	75%	[63%, 87%]	74 out of 99
Tanga	21%	[3%, 38%]	22 out of 99
Tabora	38%	[25%, 51%]	38 out of 102
Kigoma	18%	[8%, 28%]	17 out of 93
Shinyanga	39%	[31%, 47%]	48 out of 122
Morogoro	12%	[4%, 21%]	11 out of 88
Pwani	25%	[12%, 39%]	12 out of 49
Dar es Salaam	38%	[20%, 56%]	13 out of 36
Kagera	19%	[7%, 32%]	22 out of 110
Mwanza	24%	[15%, 34%]	22 out of 88
Mara	38%	[24%, 52%]	16 out of 42
Iringa	65%	[51%, 79%]	77 out of 116
Mbeya	51%	[35%, 68%]	71 out of 140
Rukwa	35%	[13%, 57%]	27 out of 80
Singida	57%	[39%, 76%]	27 out of 47
Dodoma	28%	[14%, 42%]	23 out of 87
North Zanzibar	20%	[6%, 33%]	12 out of 60
Urban West Zanzibar	14%	[5%, 24%]	6 out of 38
North Pemba	12%	[4%, 21%]	9 out of 65
South Pemba	17%	[8%, 26%]	12 out of 70
Lindi	21%	[12%, 31%]	31 out of 137
Mtwara	31%	[23%, 40%]	54 out of 168
Ruvuma	53%	[35%, 71%]	72 out of 133

Proportion of households using input in the "breadbasket" of Tanzania( Mbeya, Iringa, Ruvuma) Maize				
Input Type	Estimated Proportion	95% C.I.	Observations	
Organic Fertilizer	23%	[16%,30%]	81 out of 389	
Inorganic Fertilizer	40%	[30%,49%]]	163 out of 389	
Pesticides, Herbicides, or Fungicides	22%	[15%,30%]	83 out of 389	
IV Seed	18%	[12%,24%]	59 out of 382	

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### Input Use by Crop

Proportion of Plots Using IV Seed by Crop					
Region	Estimated Proportion	95% C.I.	Observations		
Maize	16%	[13%, 19%]	299 out of 1995		
Cassava	5%	[1%, 8%]	14 out of 305		
Paddy	5%	[2%, 8%]	29 out of 532		
Sorghum	5%	[0%, 9%]	11 out of 329		
Cowpeas	5%	[1%, <b>9</b> %]	9 out of 147		
Millet	3%	[-2%, 8%]	3 out of 116		
Groundnut	2%	[1%, 4%]	11 out of 363		
Sweet Potatoes	1%	[0%, 3%]	3 out of 225		
Beans	2%	[1%, 3%]	11 out of 609		

Proportion of Plots Applied with Inputs By Crop (Long Rainy Season)				
Maize				
Input Type	Estimated Proportion	95% C.I.	Observations	
Organic Fertilizer	16%	[13%,18%]	238 out of 1607	
Inorganic Fertilizer	16%	[12%,20%]	276 out of 1607	
Pesticides, Herbicides, or Fungicides	11%	[7%,14%]	179 out of 1607	

Proportion of Plots Applied with Inputs By Crop (Long Rainy Season) Paddy					
Input Type	Estimated Proportion	95% C.I.	Observations		
Organic Fertilizer	5%	[1%,8%]	20 out of 487		
Inorganic Fertilizer	9%	[4%,14%]	53 out of 487		
Pesticides, Herbicides, or Fungicides	11%	[3%,19%]	38 out of 487		

Proportion of Plots Applied with Inputs By Crop (Long Rainy Season) Cassava					
Input Type	Estimated Proportion	95% C.I.	Observations		
Organic Fertilizer	6%	[2%,9%]	26 out of 669		
Inorganic Fertilizer	1%	[0%,2%]	10 out of 669		
Pesticides, Herbicides, or Fungicides	1%	[0%,3%]	9 out of 669		

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### Maize Yield Analysis

Average and Median Plot Maize Yields by Input Use (Long Rainy Season )					
	icido by input obc	Mean	Jeason ,		
	Median Yield	Yield			Wald test
	(t/ha)	(t/ha)	95% C.I.	Observations	P-value*
No Fertilizer or IV Seed	0.59	0.80	[0.74, 0.85]	1189 out of 1806	
Organic Fertilizer Only	0.95	1.20	[1.02, 1.37]	153 out of 1337	.0000
Inorganic Fertilizer Only	0.91	1.16	[0.94, 1.38]	167 out of 1351	.0019
IV Seed Only	0.62	0.89	[0.71, 1.07]	145 out of 1334	.3248
Organic Fertilizer and					
IV Seed	0.49	0.78	[0.51, 1.06]	40 out of 1806	
Inorganic Fertilizer and					
IV Seed	1.42	1.71	[1.12, 2.30]	55 out of 1806	
*Compared to plots with paither fortilizer per IV seed in the same sample					

\*Compared to plots with neither fertilizer nor IV seed in the same sample.

### Expenditure on Inputs

Proportion of households that purchased input type					
Type of Input	Estimated Proportion	95% C.I.	Observations		
Any input	66%	[63%, 69%]	1,357 out of 2219		
Organic Fertilizer	4%	[3%, 5%]	87 out of 2216		
Inorganic Fertilizer	13%	[10%, 16%]	305 out of 2216		
Pesticides, Herbicides, Fungicides	15%	[12%, 17%]	329 out of 2216		
Traditional Seeds	<b>49</b> %	[46%, 52%]	947 out of 2140		
Improved Seeds	18%	[16%, 21%]	345 out of 2140		

Median household expenditure for each input among those who purchased inputs				
Type of Input	Median Household Expenditure	Observations		
All Inputs	\$10.43	1355		
Organic Fertilizer	\$8.34	86		
Inorganic Fertilizer	\$39.62	305		
Pesticides, Herbicides, Fungicides	\$8.34	329		
Traditional Seeds	\$7.01	246		
Improved Seeds	\$7.51	345		

Proportion of total value represented by each input					
Type of Input	Value of input (USD)	95% C.I.	Observations	Estimated Proportion of Value	
All inputs	1.39E+08			100%	
Organic Fertilizer	3.79E+06	[2.39E+06, 5.19E+06]	108	3%	
Inorganic Fertilizer	7.20E+07	[4.4E+07, 1.0E+07]	487	52%	
Pesticide, Herbicide, and Fungicide	1.76E+07	[1.33E+07, 2.18E+07]	488	13%	
Traditional Seeds	3.23E+07	[2.68E+07, 3.79E+07]	632	23%	
Improved Seeds	1.33E+07	[1.07E+07, 1.59E+07]	447	10%	

Proportion of households that purchased inputs by zone					
Type of Input	Estimated Proportion	95% C.I.	Observations		
All zones	66%	[63%, 69%]	1357 out of 2219		
Central	<b>59</b> %	[47%, 71%]	77 out of 134		
Eastern	70%	[61%, 80%]	116 out of 174		
Southern Highlands	66%	[57%, 74%]	220 out of 336		
Lake	64%	[57%, 71%]	155 out of 240		
Northern	65%	[58%, 72%]	209 out of 324		
Southern	60%	[54%, 67%]	262 out of 439		
Western	80%	[74%, 85%]	249 out of 317		
Zanzibar	27%	[21%, 33%]	69 out of 255		

# Descriptive Statistics for the 95<sup>th</sup> Percentile by Total Expenditure on Inputs

Five most common seasonal crops grown by households in the 95 <sup>th</sup> percentile					
In the 95th Percentile	Estimated Proportion	95% C.I.	Observations		
Maize	96%	[91%, 100%]	69 out of 73		
Beans	50%	[35%, 65%]	34 out of 73		
Tobacco	34%	[14%, 54%]	22 out of 73		
Groundnut	21%	[12%, 30%]	15 out of 73		
Sunflower	<b>19</b> %	[9%, 30%]	12 out of 73		

Proportion of household growing crops for those not in the 95th percentile					
Percentile Estimated Proportion 95% C L Observations					
		7570 C.1.			
Maize	89%	[87%, 91%]	1092 out of 1282		
Beans	39%	[34%, 43%]	447 out of 1282		
Cassava	34%	[30%, 39%]	490 out of 1282		
Groundnut	25%	[21%, 29%]	285 out of 1282		
Paddy	20%	[16%, 24%]	283 out of 1282		

Average household expenditure per hectare for those in and out the 95th percentile				
Percentile	Mean Expenditure(USD)	95% C.I.	Observations	
Not in the 95th			(00)	
Percentile	17.64	[15, 20.27]	1281	
In the 95th Percentile	182.77	[136.39, 229.14]	73	

Distribution of those in the 95 <sup>th</sup> Percentile across zones						
Zone	Estimated Proportion	95% C.I.	Observations			
Southern Highlands	38%	[17%, 59%]	35 out of 73			
Northern	23%	[5%, 40%]	9 out of 73			
Western	21%	[2%, 40%]	12 out of 73			
Central	13%	[-6%, 31%]	5 out of 73			
Southern	6%	[0%,11%]	12 out of 73			
Eastern	No Observations	-	0 out of 73			
Lake	No Observations	-	0 out of 73			
Zanzibar	No Observation	-	0 out of 73			

		a state state					
Proportion of male and female headed household for those in the 95 <sup>th</sup> percentile							
Gender of Household Head	Estimated Proportion	95% C.I.	Observations				
Male	87%	[80%, 95%]	64 out of 73				
Female	13%	[5%, 20%]	9 out of 73				
Proportion of male and fen	nale headed households for the	se not in the 95 <sup>th</sup> perce	entile				
Percentile	Estimated Proportion	95% C.I.	Observations				
Male	77%	[75%, 80%]	286 out of 1282				
Female	23%	[20%, 25%]	996 out of 1282				
Mean education level of ho	usehold head for those in and	out of the 95th percent	ile				
Dercentile	Mann advication loval (vira)		Observations				
Percentile	mean education level(yrs)	95% C.I.	Observations				
Not in the 95th Percentile	5.3	[5.1, 5.6]	1222				
Not in the 95th Percentile In the 95th Percentile	5.3 6.7	[5.1, 5.6] [6, 7.3]	1222 69				
Not in the 95th Percentile In the 95th Percentile	5.3 6.7	[5.1, 5.6] [6, 7.3]	1222 69				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea	6.7 d for those in and out of the 9	5.1, 5.6] [6, 7.3] 5th percentile	1222 69				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea	5.3 6.7 d for those in and out of the 9	53% C.I. [5.1, 5.6] [6, 7.3] 5th percentile	0bservations				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea Percentile	Mean age(yrs)	55% C.I. [5.1, 5.6] [6, 7.3] [6, 7.3] [6, 7.3]	Observations Observations				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea Percentile Not in the 95th Percentile	Mean education tever(yrs) 5.3 6.7 Ind for those in and out of the 9 Mean age(yrs) 46.8	55% C.I. [5.1, 5.6] [6, 7.3] 5th percentile 95% C.I. [45.8, 47.9]	Observations 1222 69 Observations 1282				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea Percentile Not in the 95th Percentile In the 95th Percentile	Mean age(yrs) 46.8 41.8	55h percentile 95% C.I. [45.8, 47.9] [38.4, 45.2]	Observations 1222 69 Observations 1282 73				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea Percentile Not in the 95th Percentile In the 95th Percentile	Mean age(yrs) 46.8 41.8	95% C.I.         [5.1, 5.6]         [6, 7.3]         5th percentile         95% C.I.         [45.8, 47.9]         [38.4, 45.2]	Observations 1222 69 Observations 1282 73				
Not in the 95th Percentile         In the 95th Percentile         Mean age of household heat         Percentile         Not in the 95th Percentile         In the 95th Percentile         Mean household landholding	Mean education revel(yrs)         5.3         6.7         ad for those in and out of the 9         Mean age(yrs)         46.8         41.8         ng size for those in and out of t	5th percentile 95% C.I. [45.8, 47.9] [38.4, 45.2] he 95 <sup>th</sup> percentile	Observations       1222       69       Observations       1282       73				
Not in the 95th Percentile         In the 95th Percentile         Mean age of household heat         Percentile         Not in the 95th Percentile         In the 95th Percentile         Mean household landholdin	Mean education revel(yrs)         5.3         6.7         ad for those in and out of the 9         Mean age(yrs)         46.8         41.8	5th percentile 95% C.I. [45.8, 47.9] [38.4, 45.2] he 95 <sup>th</sup> percentile 95% Confidence	Observations       1222       69       Observations       1282       73				
Not in the 95th Percentile In the 95th Percentile Mean age of household hea Percentile Not in the 95th Percentile In the 95th Percentile Mean household landholdin Percentile	Mean education tevel(yrs) 5.3 6.7 Mean age(yrs) 46.8 41.8 mg size for those in and out of t Mean plotsize (ha)	55.1, 5.6] [6, 7.3] 55.1, 56.2] [6, 7.3] 55.1, 56.2] [6, 7.3] 55.1, 56.2] [6, 7.3] 55.1, 56.2] [6, 7.3] 55.1, 56.2] [6, 7.3] 55.1, 56.2] [6, 7.3] [6, 7.3] [45.8, 47.9] [38.4, 45.2] 55.2]	Observations       000000000000000000000000000000000000				

[2.5, 5.3]

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3.9

In the 95th Percentile

### Bivariate Analysis of Factors Affecting Input Use

Bivariate analysis results for the probability of inorganic fertilizer use						
Variable	Coefficient	P value	95% C.I.	Marginal Effects	Observations	
Amount spent on hired labor (USD)	0.002	0.004	[0.001, 0.004]	0.0003	1013	
Education of household head	0.145	0	[0.095, 0.196]	0.0150	2121	
Age of household head	-0.002	0.668	[-0.013, 0.008]	-0.0003	2216	
Advice from extension officer	0.997	0	[0.636, 1.358]	0.1051	2216	
Farmers' cooperative present	-0.100	0.718	[-0.643, 0.444]	-0.0111	2157	
Female household head	-0.237	0.175	[-0.580, 0.106]	-0.0266	2216	
Household landholding size (acres)	0.011	0.264	[-0.008, 0.029]	0.0012	2214	

#### Bivariate analysis results for the probability of inorganic fertilizer use (over Zone)

Zone	Coefficient	P Value	95% C.I.	Marginal Effects	Observations
Central	-0.999	0.168	[-2.421, 0.422]	-0.1131	2216
Eastern	-1.017	0.09	[-2.194, 0.161]	-0.1128	2216
Southern Highlands	1.695	0	[1.150, 2.240]	0.1618	2216
Lake	-3.005	0	[-4.531, -1.479]	-0.307	2216
Northern	0.184	0.618	[-0.542, 0.910]	0.0206	2216
Southern	0.423	0.157	[-0.163, 1.010]	0.0485	2216
Western	-0.741	0.039	[-1.443, -0.0384]	-0.828	2216
Zanzibar	-0.543	0.064	[-1.119, 0.0319]	-0.0587	2216

Bivariate analysis results for the probability of IV seed use							
Variable	Coefficient	P value	95% C.I.	Marginal Effects	Observations		
Amount spent on hired labor (USD)	0.002	0.001	[0.001, 0.004]	0.0004	989		
Education of household head	0.103	0	[0.063, 0.144]	0.0171	2048		
Age of household head	-0.003	0.457	[-0.010, 0.005]	-0.0005	2140		
Advice from extension officer	0.970	0	[0.693, 1.247]	0.1589	2140		
Farmers' cooperative present	-0.236	0.162	[-0.566, 0.095]	-0.0396	2085		
Female household head	-0.430	0.007	[-0.744, -0.117]	-0.0727	2140		
Household landholding size (acres)	0.021	0.003	[0.007, 0.036]	0.0036	2138		

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Bivariate analysis results for the probability of IV seed use (over Zone)						
Zone	Coefficient	P value	95% C.I.	Marginal Effect	Observations	
Central	-0.206	0.536	[-0.858, 0.447]	-0.035	2,140	
Eastern	-0.092	0.646	[-0.487, 0.303]	-0.0157	2,140	
Southern Highlands	-0.216	0.324	[-0.645, 0.214]	-0.0366	2,140	
Lake	-0.149	0.525	[-0.611, 0.312]	-0.0255	2,140	
Northern	1.039	0	[0.639, 1.439]	0.1708	2,140	
Southern	-1.121	0	[-1.529, -0.713]	-0.1767	2,140	
Western	0.015	0.94	[-0.372, 0.402]	0.0025	2,140	
Zanzibar	-0.562	0.026	[-1.057, -0.066]	-0.0926	2,140	

# Bivariate analysis results for the probability of pesticide, herbicide, or fungicide use

Variable	Coefficient	P value	95% C.I.	Marginal Effect	Observations
Amount spent on hired labor (USD)	0.003	0.001	[0.001, 0.005]	0.0005	1,013
Education of household head	0.126	0	[0.087, 0.165]	0.0152	2,121
Age of household head	-0.01	0.018	[-0.018, -0.002]	-0.0012	2,216
Advice from extension officer	1.088	0	[0.775, 1.401]	0.1276	2,216
Farmers' cooperative present	-0.059	0.784	[-0.482, 0.364]	-0.0074	2,157
Female household head	-0.529	0.002	[-0.867, -0.191]	-0.0657	2,216
Household landholding size (acres)	0.022	0.006	[0.006, 0.037]	0.0027	2,214

Bivariate analysis results for the probability of pesticide, herbicide, or fungicide use (over zone)						
Zone	Coefficient	P value	95% C.I.	Marginal Effect	Observations	
Central	-1.173	0.078	[-2.479, 0.134]	-0.1481	2,216	
Eastern	-0.237	0.534	[-0.985, 0.512]	-0.0297	2,216	
Southern Highlands	0.606	0.018	[0.105, 1.107]	0.0742	2,216	
Lake	-0.904	0.017	[-1.647, -0.161]	-0.1148	2,216	
Northern	0.593	0.017	[0.107, 1.079]	0.073	2,216	
Southern	0.409	0.067	[-0.029, 0.847]	0.0524	2,216	
Western	-0.207	0.414	[-0.705, 0.291]	-0.026	2,216	
Zanzibar	-1.519	0	[-2.218,-0.820]	-0.1704	2,216	