

Electronic Supplementary Material

Table A1. Crop production estimates, PFJ and selected non-PFJ crops, 2016-2019

	Year crop added to PFJ	Production ('000 mt)			Avg. annual growth 2016- 2019 (%)	Area ('000 ha)			Avg. annual growth 2016- 2019 (%)	Yield (mt/ha)			Avg. annual growth 2016- 2019 (%)	Yield growth share output growth
		2016	2019	Change		2016	2019	Change		2016	2019	Change		
<u>Planting for Food and Jobs (PFJ) crops</u>														
Maize	2017	1,722	2,896	1,174	18.9	865	1,149	284	9.9	1.99	2.52	0.5	8.2	44.8
Rice	2017	688	920	232	10.2	236	281	45	6.0	2.92	3.27	0.4	3.9	38.7
Sorghum	2017	230	346	117	14.7	201	226	25	4.0	1.14	1.53	0.4	10.3	73.1
Cowpea	2019	206	247	41	6.2	147	169	23	4.9	1.41	1.46	0.1	1.2	19.5
Groundnuts	2018	426	558	132	9.4	327	336	9	0.9	1.30	1.66	0.4	8.5	91.3
Soybean	2017	143	193	50	10.5	87	112	25	8.9	1.65	1.72	0.1	1.4	13.0
Cassava	2018	17,798	22,127	4,329	7.5	879	1,021	142	5.1	20.25	21.67	1.4	2.3	30.3
Sweet potatoes	2019	145	155	10	2.2	74	74	0	0.0	1.94	2.08	0.1	2.3	100.0
Yam	2019	7,440	8,753	1,312	5.6	427	500	72	5.4	17.42	17.52	0.1	0.2	3.4
Plantain	2019	4,000	4,887	886	6.9	358	409	51	4.5	11.17	11.94	0.8	2.3	32.7
Tomatoes	2017	376	420	44	3.8	49	52	3	2.2	7.68	8.03	0.3	1.5	39.8
Onions	2017	153	166	13	2.8	9	9	0	1.4	17.42	18.12	0.7	1.3	47.8
Chili (green)	2017	129	141	13	3.2	15	16	1	1.6	8.61	9.02	0.4	1.6	49.8
<u>Other crops</u>														
Millet	N/A	159	230	71	13.2	137	148	11	2.6	1.16	1.56	0.4	10.3	81.3
Cocoyam	N/A	1,344	1,413	70	1.7	206	214	8	1.3	6.53	6.60	0.1	0.4	21.7
Oil palm	N/A	1,867	2,080	213	3.7	338	360	22	2.1	5.52	5.77	0.2	1.5	40.9
Cocoa	N/A	859	947	89	3.3	1,684	1,785	102	2.0	0.51	0.53	0.0	1.3	40.0

Source: Author's compilation based on MoFA (2020) and FAO (2020).

Note: Carrot, cucumber, lettuce, and cabbage were added as priority crops in 2018, but no crop production estimates are available for these vegetables. Although detailed crop estimates for 2020 were not yet available at the time of writing, provisional production estimates for maize (3,071,000 mt), paddy rice (973,000 mt) and sorghum (356,000 mt) were published in MoFA & GHS (2021). These numbers suggest a slight slowdown in crop output growth in 2020—despite a large increase in subsidized inputs—resulting in average annual growth over the period from 2016 to 2020 declining to 15.6, 9.1, and 11.6 percent for maize, rice, and sorghum, respectively.

Table A2. Impact assessment tool: input allocation module

	2014	2015	2016	2017	2018	2019	2020
Subsidized seed supplies, mt							
Maize seed (PFJ)				2,370	4,029	9,031	13,951
Rice seed (PFJ)				1,698	2,399	6,544	10,951
Fertilizer supplies, mt ⁽¹⁾	104,825	282,213	239,858	440,661	310,866	423,604	505,788
Subsidized (FSP) ⁽²⁾		89,200	134,227	176,000			
o/w applied to maize		31,910	48,309	67,230			
o/w applied to rice		8,456	13,168	16,437			
Subsidized (PFJ) ⁽³⁾				121,000	242,866	325,166	423,473
o/w applied to maize				58,691	115,059	150,640	202,411
o/w applied to rice				21,672	36,182	65,470	95,331
Commercial ⁽⁴⁾	104,825	193,013	105,631	143,661	68,000	98,438	82,315
o/w applied to maize	35,400	58,270	31,966	46,491	22,055	33,951	29,591
o/w applied to rice	7,756	15,442	8,713	11,367	5,613	8,307	6,984
Land allocation ⁽⁵⁾							
Total maize land, ha ('000)	1,024.5	880.3	865.3	984.5	1,020.5	1,149.3	1,263.4
FSP beneficiaries (fertilizer only)		85.1	128.8	179.3			
PFJ beneficiaries (fertilizer & seed)				105.3	179.1	401.4	539.8
PFJ beneficiaries (seed only)							80.3
PFJ beneficiaries (fertilizer only)				51.2	127.8	0.3	
Non-beneficiaries	1,024.5	795.2	736.5	648.7	713.7	747.6	643.3
Total rice land, ha ('000)	224.5	233.3	235.9	240.7	259.7	281.2	298.2
FSP beneficiaries (fertilizer only)		21.1	32.9	41.1			
PFJ beneficiaries (fertilizer & seed)				42.5	60.0	163.6	238.3
PFJ beneficiaries (seed only)							35.4
PFJ beneficiaries (fertilizer only)				11.7	30.5	0.1	
Non-beneficiaries	224.5	212.1	202.9	145.4	169.3	117.5	24.4

Source: Modeled estimates

Notes: ⁽¹⁾ Compare Figure 1. ⁽²⁾ Approximately 37 percent of FSP fertilizer is allocated to maize and 10 percent to rice, based on non-cocoa fertilizer use by crop (Table 2). Note fertilizer allocation shares vary slightly each year as cropped areas change.⁽³⁾ Approximately 47 percent of PFJ fertilizer is allocated to maize and 20 percent to rice, based on seed supply ratios and recommended fertilizer application rates (i.e., 375 and 400 kilograms per hectare for maize and rice, respectively). ⁽⁴⁾ Approximately 32 percent of FSP fertilizer is allocated to maize and 8 percent to rice, based on fertilizer use by crop (Table 2). Note fertilizer allocation shares vary slightly each year as cropped areas change. ⁽⁵⁾ Land allocations are based on input application rates, including fertilizer use rates as reported above and seed application rates of 22.5 and 40.0 kilograms per hectare for maize and rice, respectively. Fertilizer and seed quantities are not necessarily balanced each year, resulting in some farmers only receiving one of the two outputs in some years. Total cropland is exogenous, based on official crop estimates, and non-beneficiary land is a residual after land has been allocated to beneficiary farmers.

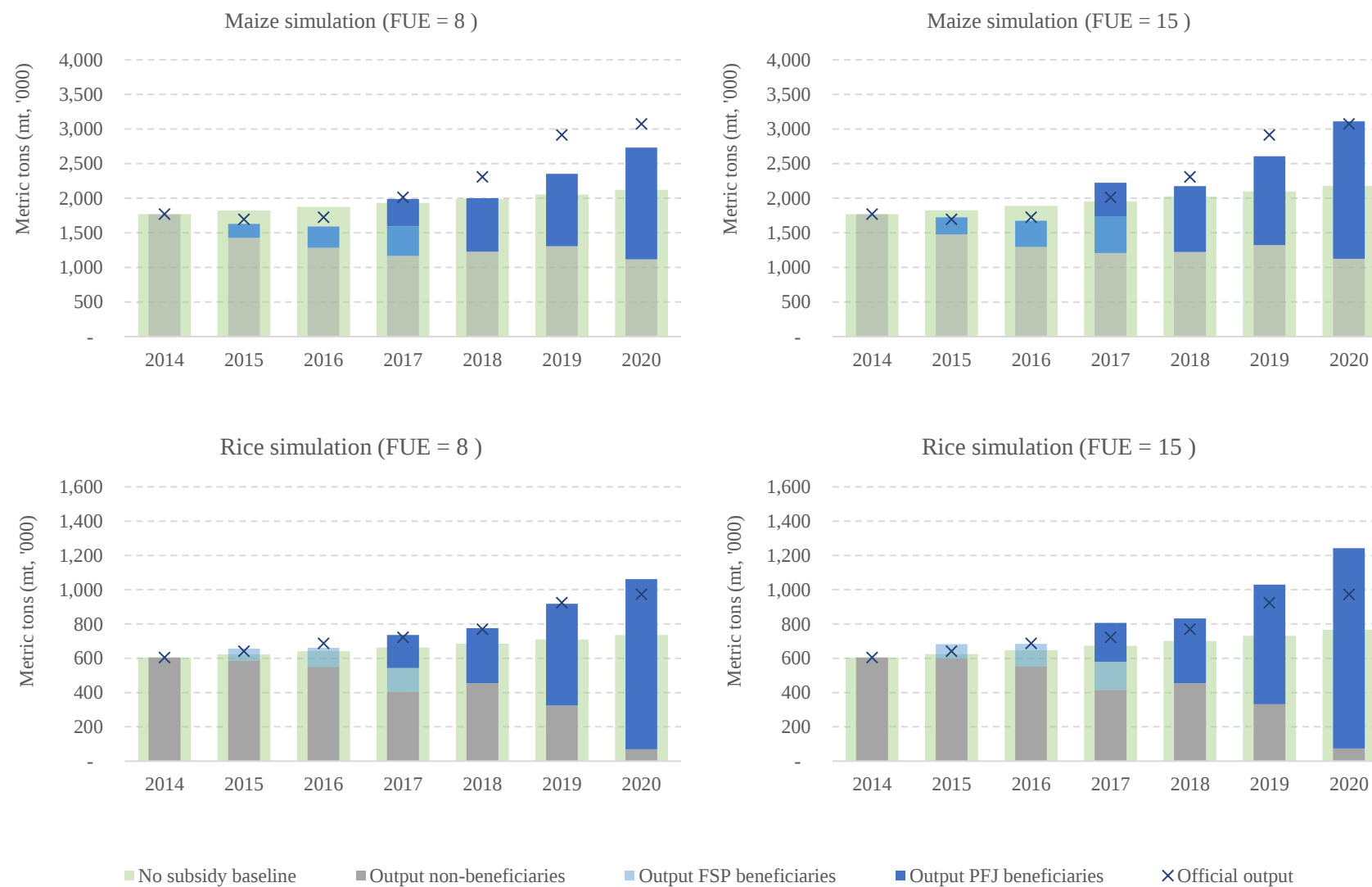
Table A3. PFJ value-cost ratios

	Maize					Paddy rice				
	2017	2018	2019	2020	Average ⁽³⁾	2017	2018	2019	2020	Average ⁽³⁾
Farmgate price (GH¢/mt)	1,109	1,344	1,054	977		880	1,479	1,426	1,325	
Marginal output, mt ('000)										
FUE = 8	58.0	7.3	299.5	609.9		73.7	90.7	207.9	326.5	
FUE = 15	269.8	149.0	506.1	928.5		133.2	131.4	297.0	475.0	
Marginal output value, GH¢ mil.										
FUE = 8	64.3	9.8	315.6	595.8		64.9	134.1	296.4	432.4	
FUE = 15	299.2	200.2	533.4	907.0		117.2	194.3	423.5	629.2	
Farmers' marginal cost ⁽¹⁾	100.0	102.6	204.1	305.9		36.2	41.3	114.8	194.9	
Total marginal cost ⁽²⁾	213.1	322.9	513.3	852.9		78.8	121.7	274.4	509.0	
Value-cost ratio (farmers)										
FUE = 8	0.64	0.10	1.55	1.95	1.06	1.79	3.25	2.58	2.22	2.46
FUE = 15	2.99	1.95	2.61	2.96	2.63	3.24	4.70	3.69	3.23	3.71
Value-cost ratio (total)										
FUE = 8	0.30	0.03	0.61	0.70	0.41	0.82	1.10	1.08	0.85	0.96
FUE = 15	1.40	0.62	1.04	1.06	1.03	1.49	1.60	1.54	1.24	1.47

Source: Modeled estimates. Farmgate prices are from FAO (2020).

Notes: ⁽¹⁾ Farmers marginal costs are estimated as the cost of acquiring subsidized seed and fertilizer—we assume this matches the government expenditure on these two inputs considering a subsidy rate of 50 percent—minus the cost of inputs that would have been procured in the commercial market in the absence of the subsidy program. ⁽²⁾ Total marginal cost is the farmers' cost plus the full government expenditure on PFJ as reported in Table 1. ⁽³⁾ The average column is a simple average across the four years (see Figure 3). The shaded rows represent the simulated outcomes that most closely match official reported crop estimates.

Figure A1. Impact assessment tool: projected outputs with and without subsidy, 2014 to 2020



Source: Modeled estimates