



Agricultural Policy Research in Africa



# AGRICULTURAL COMMERCIALISATION IN SOUTH-WESTERN GHANA

Louis S. Hodey and Fred M. Dzanku

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## 1. Introduction

The Agricultural Policy Research in Africa (APRA) study in Ghana consists of three work streams. This report contains results of the analyses of Work Stream 1 (WS1) baseline and endline survey datasets for Ghana. Baseline and endline data were collected in November/December 2017 and November/December 2019 respectively.

Oil palm commercialisation arrangements and outcomes are the focus of WS1 in Ghana. Case studies have been carried out in two districts – Ahanta West and Mpohor – in Western Region. This report highlights the changes between 2017 and 2019 for five APRA indicators, including agricultural commercialisation (input and output), employment, poverty (income, subjective poverty and household asset ownership), food security and women empowerment. We grouped households into four oil palm commercialisation channels in our analysis – Norpalm Ghana Ltd (NGL), Benso Oil Palm Plantation (BOPP), B-BOVID, and an independent channel (this includes those selling directly to the market, selling to small-scale processors, and those processing their own output). NGL and BOPP are two of Ghana's 'big four' oil palm companies, while B-BOVID is a medium-scale producer.

Based on a t-test of differences, between baseline and endline means of the key indicators, we find that except for the quantity of chemical fertiliser used per hectare, generally, input commercialisation has not changed significantly between 2017 and 2019. Even for quantity of fertiliser used per hectare, only farmers engaged in the NGL and B-BOVID channels reported significant changes. Further, our results show that though there is no significant change in the overall household commercialisation index, the oil palm commercialisation index significantly increased in the study area between 2017 and 2019. Similarly, we find

significant increases in the share of land devoted to oil palm, and the share of land devoted to non-food cash crops. Generally, poverty indicators have revealed a significant decline in poverty among oil palm farmers in the study area. Further, though there was no significant change in household dietary diversity, there was some improvement in the food security situation. Indeed, the incidence of moderate or severe food insecurity declined significantly, yet the minimum dietary diversity for women declined. On employment indicators, we find significant increases in the imputed remuneration for household farm workers, and the yearly returns to regular employment. We find no significant change in women empowerment indicators, however, in the study area between 2017 and 2019.

## 2. Data and changes in key APRA indicators

Baseline and endline data were collected in oil palm producing communities across the Ahanta West and Mpohor districts of Ghana's Western Region in November/December 2017 and November/December 2019.

Using the t-test of differences in means, we analysed the changes between baseline and endline APRA indicators – agricultural commercialisation (input and output), employment, poverty (income, subjective poverty and household asset ownership), food security and women empowerment.

### 2.1. Agricultural commercialisation

The agricultural commercialisation indicators were broadly categorised into input commercialisation and output commercialisation indicators. First, the input commercialisation indicators included value of

**Table 1: Distribution of sample across four oil palm commercialisation channels, 2017 and 2019**

Commercialisation channel	2017	2019	Total
NGL	100	98	198
	(13.8)	(12.2)	(13.0)
BOPP	140	125	265
	(19.3)	(15.6)	(17.4)
B-BOVID	79	111	190
	(10.9)	(13.8)	(12.4)
Independent	406	468	874
	(56.0)	(58.4)	(57.2)
Total	725	802	1,527
	(100.0)	(100.0)	(100.0)

Note: Figures in parentheses are cell percentages.

Source: Authors' own, based on APRA-Ghana WS1 data, 2017 and 2019

purchased inputs, purchased inputs per hectare, the use of chemical fertiliser, quantity of chemical fertiliser used per hectare, the use of hired labour, and the cost of hired labour used. Generally, we find no significant changes in the input commercialisation indexes between 2017 and 2019 in the study area. The only exception is chemical fertiliser used per hectare which recorded an increase from 19.95 kg/ha in 2017 to 24.42 kg/ha in 2019 (Table 1 and Table 2). Among the four commercialisation channels, farmers engaged in the NGL and B-BOVID channels reported increases in chemical fertiliser used per hectare and a significant increase in purchased input per hectare.

The output commercialisation indicators included the household commercialisation index, purely commercialised households, the oil palm commercialisation index, oil palm's contribution to household commercialisation, cocoa's contribution to household commercialisation, the share of land devoted to non-food crops, and the share of land devoted to oil palm. Though we find no significant change in the household commercialisation index for the overall sample, significant differences were seen for farmers engaged in the BOPP and independent channels. Next, we find significant increases in the number of purely commercialised households, the oil palm commercialisation index, the share of land devoted to oil palm, and the share of land devoted to non-food cash crops. Specifically, the index of purely commercialised households increased from 0.34 in 2017 to 0.46 in 2019, the overall oil palm commercialisation index increased by 4.0 percentage points over the period, and the share of land devoted to oil palm and the share of land devoted to non-food cash crops respectively increased by 3.9 and 19.1 percentage points (Table 1 and Table 2). Across the commercialisation channels, only farmers engaged in the B-BOVID channel showed significant increases in the oil palm commercialisation index.

## 2.2. Poverty

The key indicators used to measure household poverty status are the money metric indicators (per capita net income and the poverty headcount ratio), the asset index (composite assets, productive assets, consumer assets, housing and services assets), and the subjective poverty index (subjective poverty headcount ratio and the subjective poverty index). We find that respectively, the per capita net income (PPP US\$/capita) and the per capita net income (PPP US\$/adult equivalent) significantly increased by 484.50 and 298.38 between 2017 and 2019 in the study area. Similarly, poverty headcount ratio at US\$1.90 (PPP/capita/day) and the poverty headcount ratio at US\$1.90 (PPP/adult equivalent/day) significantly declined between 2017 and 2019 by -0.09 and -0.05 respectively. Across the output commercialisation channels, farmers engaged in

the NGL and independent channels recorded significant increases in per capita net income. Among the household asset indicators, the composite asset index and the consumer asset index significantly increased over the period by 0.017 and 0.019 respectively. Overall, the subjective poverty index declined from 0.486 to 0.312 between 2017 and 2019 (Table 1 and Table 2). Compared to their counterparts in the other output commercialisation channels, farmers in the NGL and BOPP channels showed significant declines in the subjective poverty index.

## 2.3. Food security

We used the dietary diversity score (minimum dietary diversity for women and household dietary diversity), and the food insecurity experience scale, to measure household food security status. First, we find that minimum dietary diversity for women significantly declined from 0.18 to 0.16 between 2017 and 2019 (Table 1 and Table 2). Among the commercialisation channels, only farmers engaged in the NGL and independent channels reported declines in women dietary diversity. Second, the incidence of moderate or severe food insecurity declined significantly from 0.52 to 0.37 over the period. However, this finding differed markedly between the commercialisation channels. Specifically, only households in the B-BOVID and independent channels experienced significant declines in moderate and severe food insecurity between 2017 and 2019.

## 2.4. Employment

The employment indicators in the study include days worked on the farm per family farm worker, imputed remuneration for household farm workers, total farm labour days per hectare, hired labour share of farm labour per hectare, returns to labour, yearly returns to regular employment, and yearly returns to self-employment. Our results show that for all the commercialisation channels, the imputed remuneration for household farm worker increased significantly over the period. Overall, there was an increase by US\$334.19 between 2017 and 2019. Additionally, the yearly returns to regular employment increased by US\$72.09 over the period. Among the commercialisation channels, households in the NGL and BOPP channels reported significant increases in the yearly returns to regular employment by US\$68.75 and US\$495.57 respectively (Table 1 and Table 2).

## 2.5. Women empowerment

Plot management, input use, crop sale, and crop revenue use decisions of women relative to men are the key indicators used to determine the level of women empowerment in the study. Our results do not point to any significant change in women empowerment across the various channels of output commercialisation over the period (Table 1 and Table 2).

**Table 1: Distribution of sample across four oil palm commercialisation channels, 2017 and 2019**

Indicator	ALL			NGL			BOPP			B-BOVID			Independent		
	2017	2019	Change	2017	2019	Change	2017	2019	Change	2017	2019	Change	2017	2019	Change
<b>Input commercialisation indicators</b>															
Purchased input (US\$)	576.12	570.04	-6.08	435.10	887.83	452.74	830.67	597.80	-232.87	486.07	409.75	-76.32	517.38	530.52	13.15
Purchased input per hectare (US\$/ha)	422.24	235.52	-186.71	76.09	222.07	145.98	288.60	269.37	-19.23	450.22	530.34	80.12	557.83	162.40	-395.43
Chemical fertiliser use (1/0)	0.21	0.23	0.02	0.30	0.27	-0.04	0.19	0.23	0.04	0.20	0.22	0.02	0.19	0.22	0.03
Chemical fertiliser (kg/ha)	19.95	24.42	4.47	11.40	16.65	5.25	13.50	14.10	0.60	12.90	11.10	-1.80	5.13	5.98	0.85
Hired labour (1/0)	0.63	0.61	-0.02	0.56	0.55	-0.02	0.77	0.72	-0.05	0.46	0.56	0.10	0.62	0.60	-0.02
Value of labour hired (US\$)	537.81	476.03	-61.78	428.87	540.64	111.77	715.10	541.61	-173.49	546.05	338.76	-207.29	477.50	472.55	-4.95
<b>Output commercialisation indicators</b>															
Household commercialisation index (HCI) (%)	80.33	78.81	-1.52	0.373	85.63	85.38	-0.25	0.950	83.06	89.34	6.28	0.038	75.08	83.85	8.77
Purely commercialised household (1/0)	0.34	0.46	0.12	0.000	0.58	0.48	-0.09	0.227	0.27	0.65	0.38	0.000	0.39	0.51	0.12
Oil palm commercialisation index (%)	87.03	91.23	4.20	0.001	88.68	93.79	5.11	0.120	85.23	89.63	4.40	0.227	85.04	94.11	9.08
Oil palm's contribution to HCI (%)	70.97	71.85	0.89	0.662	0.72	0.73	0.02	0.742	56.62	58.10	1.47	0.759	67.80	71.30	3.51
Cocoa's contribution to HCI (%)	13.28	10.78	-2.50	0.603	1.71	1.09	-0.62	0.136	37.42	34.85	-2.57	0.540	15.21	13.98	-1.23
Share of land to oil palm (%)	69.11	72.98	3.87	0.012	67.49	76.31	8.81	0.043	55.37	55.55	0.18	0.966	68.84	70.19	1.35
Share of land to non-food cash crops (%)	74.20	80.78	19.11	0.000	55.32	74.43	19.11	0.000	82.16	83.08	10.25	0.044	65.77	76.02	10.25
<b>Employment indicators</b>															
Days worked on farm per family farm worker	41.70	43.40	1.70	34.31	32.89	-1.42	61.18	57.22	-3.96	34.46	37.42	2.96	41.49	76.09	34.60
Imputed remuneration of household farm labour (US\$/worker)	504.85	649.21	144.36	334.19	396.95	62.76	956.93	1102.19	145.26	437.57	517.83	-400.15	324.28	810.67	486.39
Total farm labour days per hectare	39.45	43.70	4.25	35.65	31.90	-3.75	40.85	42.38	1.53	43.11	57.80	14.69	40.88	48.19	7.31
Hired labour share of farm labour per hectare	0.22	0.24	0.02	0.25	0.27	0.02	0.24	0.38	0.14	0.16	0.21	0.05	0.21	0.18	-0.03
Returns to labour (US\$/worker)	502.84	548.48	45.64	554.38	561.74	7.36	832.00	854.44	22.44	295.58	338.76	43.18	326.96	442.02	115.06
Yearly returns to regular employment (US\$/worker)	914.37	986.46	72.09	759.73	828.48	68.75	1336.70	1832.27	495.57	1146.79	1201.83	55.04	759.56	783.03	23.47
Yearly returns to self-employment (US\$/worker)	595.79	542.60	-53.19	496.50	469.22	-27.28	623.57	648.22	24.65	521.94	838.76	316.82	598.32	880.38	282.06

Indicator	ALL			NGL			BOPP			B-BOVID			Independent		
	2017	2019	Change	2017	2019	Change	2017	2019	Change	2017	2019	Change	2017	2019	Change
<b>Income poverty indicators</b>															
Per capita net income (PPP US\$/capita)	1028.00	1512.50	484.50	1073.58	1588.85	515.27	1578.18	1675.52	97.34	929.24	991.39	62.15	953.00	1249.94	296.94
Per capita net income (PPP US\$/adult equivalent)	1422.00	1720.38	298.38	1387.10	1941.45	554.35	1952.94	1984.92	31.99	1219.30	1232.19	12.89	1229.00	1448.09	219.09
<b>Indicator</b>															
Poverty headcount ratio at US\$1.90 PPP/capita/day (%)	0.50	0.41	-0.09	0.41	0.32	-0.09	0.32	0.30	-0.02	0.58	0.51	-0.07	0.60	0.42	-0.18
Poverty headcount ratio at US\$1.90 PPP/adult equivalent/day (%)	0.43	0.38	-0.05	0.44	0.21	-0.23	0.21	0.18	-0.03	0.48	0.44	-0.04	0.52	0.41	-0.11
<b>Household asset indicators</b>															
Composite asset index	0.314	0.331	0.017	0.275	0.309	0.033	0.353	0.353	-0.001	0.322	0.327	0.005	0.309	0.332	0.023
Productive asset index	0.259	0.254	-0.004	0.246	0.247	0.001	0.301	0.282	-0.019	0.243	0.255	0.012	0.250	0.249	-0.001
Consumer asset index	0.346	0.365	0.019	0.303	0.340	0.037	0.389	0.388	-0.001	0.354	0.359	0.005	0.339	0.365	0.025
Housing and services asset index	0.600	0.608	0.008	0.510	0.603	0.093	0.634	0.625	-0.009	0.580	0.588	0.008	0.614	0.610	-0.004
<b>Food security indicators</b>															
Minimum dietary diversity for women	0.18	0.16	-0.02	0.13	0.16	0.03	0.20	0.17	-0.03	0.176	0.152	-0.024	0.19	0.17	-0.03
Household dietary diversity share	0.19	0.18	-0.01	0.14	0.18	0.04	0.21	0.19	-0.02	0.168	0.178	0.010	0.18	0.18	0.00
Experienced moderate or severe food insecurity	0.52	0.37	-0.15	0.62	0.48	-0.13	0.50	0.43	-0.08	0.576	0.367	-0.209	0.49	0.33	-0.16
<b>Subjective poverty indicators</b>															
Subjective poverty headcount ratio	0.205	0.271	0.066	0.211	0.144	-0.067	0.145	0.137	-0.008	0.254	0.235	-0.019	0.212	0.205	-0.007
Subjective poverty index	0.486	0.312	-0.174	0.504	0.302	-0.202	0.469	0.409	-0.06	0.474	0.4332	-0.0408	0.483	0.295	-0.188
<b>Women's empowerment indicators</b>															
Plot management decisions relative to men (share)	0.411	0.390	-0.022	0.330	0.284	-0.046	0.361	0.419	0.059	0.494	0.425	-0.068	0.433	0.396	-0.038
Output use decisions relative to men (share)	0.420	0.390	-0.031	0.345	0.289	-0.056	0.389	0.407	0.018	0.487	0.425	-0.062	0.437	0.398	-0.039
Crop sale decisions relative to men (share)	0.287	0.255	-0.032	0.273	0.198	-0.075	0.193	0.218	0.025	0.435	0.234	-0.202	0.299	0.284	-0.015
Crop revenue use decisions relative to men (share)	0.271	0.258	-0.013	0.253	0.188	-0.066	0.175	0.216	0.041	0.442	0.261	-0.181	0.280	0.287	0.007

Source: Authors' own, based on APRA-Ghana WS1 Data, 2017 and 2019

**Table 3: P-values from the test for difference between means (2017 versus 2019)**

Indicator	P-values (2017 versus 2019)				
	All	NGL	BOPP	B-BOVID	Independent
<b>Input commercialisation indicators</b>					
Purchased input (US\$)	0.929	0.086	0.205	0.501	0.871
Purchased input per hectare (US\$/ha)	0.236	0.022	0.928	0.888	0.110
Chemical fertiliser use (1/0)	0.387	0.603	0.487	0.800	0.361
Chemical fertiliser (kg/ha)	0.007	0.043	0.219	0.033	0.402
Hired labour (1/0)	0.468	0.831	0.382	0.207	0.593
Value of labour hired (US\$)	0.363	0.675	0.262	0.095	0.955
<b>Output commercialisation indicators</b>					
Household commercialisation index (HCI) (%)	0.373	0.950	0.038	0.083	0.022
Purely commercialised household (1/0)	0.000	0.227	0.000	0.123	0.005
Oil palm commercialisation index (%)	0.001	0.120	0.227	0.031	0.123
Oil palm's contribution to HCI (%)	0.662	0.742	0.759	0.610	0.514
Cocoa's contribution to HCI (%)	0.603	0.136	0.540	0.302	0.887
Share of land to oil palm (%)	0.012	0.043	0.966	0.776	0.000
Share of land to non-food cash crops (%)	0.000	0.000	0.044	0.044	0.002
<b>Employment indicators</b>					
Days worked on farm per family farm worker	0.418	0.692	0.400	0.544	0.019
Imputed remuneration of household farm labour (US\$/worker)	0.032	0.011	0.002	0.010	0.000
Total farm labour days per hectare	0.391	0.712	0.793	0.041	0.181
Hired labour share of farm labour per hectare	0.108	0.403	0.037	0.429	0.619
Returns to labour (US\$/worker)	0.061	0.204	0.118	0.292	0.014
Yearly returns to regular employment (US\$/worker)	0.047	0.038	0.000	0.871	0.489
Yearly returns to self-employment (US\$/worker)	0.336	0.576	0.303	0.029	0.022
<b>Income poverty indicators</b>					
Per capita net income (PPP US\$/capita)	0.000	0.014	0.232	0.183	0.041
Per capita net income (PPP US\$/adult equivalent)	0.000	0.034	0.529	0.291	0.044
Poverty headcount ratio at US\$1.90 PPP/capita/day (%)	0.014	0.034	0.046	0.039	0.015
Poverty headcount ratio at US\$1.90 PPP/adult equivalent/day (%)	0.028	0.018	0.024	0.040	0.031
<b>Household asset indicators</b>					
Composite asset index	0.033	0.106	0.976	0.848	0.039
Productive asset index	0.511	0.964	0.229	0.534	0.860
Consumer asset index	0.033	0.106	0.976	0.848	0.039
Housing and services asset index	0.286	0.000	0.683	0.746	0.657
<b>Food security indicators</b>					
Minimum dietary diversity for women	0.006	0.046	0.102	0.195	0.003
Household dietary diversity share	0.244	0.000	0.043	0.478	0.523
Experienced moderate or severe food insecurity	0.000	0.124	0.266	0.015	0.000
<b>Subjective poverty indicators</b>					
Subjective poverty headcount ratio	0.178	0.034	0.664	0.248	0.612
Subjective poverty index	0.021	0.041	0.025	0.589	0.000
<b>Women's empowerment indicators</b>					
Plot management decisions relative to men (share)	0.241	0.310	0.163	0.203	0.139
Output use decisions relative to men (share)	0.095	0.216	0.663	0.251	0.121
Crop sale decisions relative to men (share)	0.169	0.198	0.614	0.006	0.654
Crop revenue use decisions relative to men (share)	0.596	0.263	0.411	0.017	0.834

Source: Authors' own, based on APRA WS1 Data, 2017 and 2019

## **Conclusions**

This report aims to assess the changes in key agricultural commercialisation and key household outcome indicators in south-western Ghana between 2017 and 2019. We analysed changes in broad APRA indicators such as agricultural commercialisation indicators, poverty, food security, employment, and women empowerment. Overall, we find significant changes in certain agricultural commercialisation indicators (the quantity of chemical fertiliser used per hectare, the oil palm commercialisation index, the share of land devoted to oil palm, and the share of land devoted to non-food cash crops), poverty (per capita net income, poverty headcount ratio, and the subjective poverty index), food security (minimum dietary diversity for women, and the incidence of moderate or severe food insecurity), and employment (the imputed remuneration for household farm worker, and the yearly returns to regular employment). However, we find no significant changes in women's empowerment indicators in the study area over the period. Our findings suggest that between 2017 and 2019 there were marked differences in the changes in agricultural commercialisation indicators and household outcomes in the study area.

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