



Agricultural Policy Research in Africa



IMPACT OF COMMERCIALISATION PATHWAYS ON INCOME AND ASSET ACCUMULATION: EVIDENCE FROM SMALLHOLDER FARMING IN ZIMBABWE

Godfrey Mahofa, Vine Mutyasira and Chrispen Sukume

Working Paper

WP|89
April 2022

CONTENTS

Acknowledgements	3
Executive summary	4
1 Introduction	5
2 Literature review	7
3 Data and methods	9
3.1 Survey and sample description.....	9
3.2 Commercialisation pathway indicators.....	9
3.3 Income, poverty and asset accumulation indicators.....	9
4 Empirical approach	10
5 Discussion of results	11
5.1 Household characteristics.....	13
5.2 Econometric results.....	13
6 Conclusions and policy recommendations	19
References	20
Appendix	22

List of tables:

Table 1.1: Cropping patterns in Mvurwi and Concession.....	6
Table 5.1: Selected household characteristics.....	14
Table 5.2: Impact of commercialisation on income and asset accumulation.....	16
Table 5.3: Impact of commercialisation on farm income and asset accumulation-fixed effects estimates.....	17

List of figures

Figure 5.1: Annual farm income (US\$), 2018 and 2020.....	11
Figure 5.2: Log farm income density functions.....	12
Figure 5.3: Asset value (US\$), 2018 and 2020.....	12

ACKNOWLEDGEMENTS



We are grateful for the contribution of extension officers in Mvurwi and Concession areas and also research assistants who made data collection possible. Special thanks also goes to all of the respondents for providing useful insights. This research was conducted under the Agricultural Policy Research in Africa programme. The authors would like to acknowledge the financial and technical support from the Institute of Development Studies.

Godfrey Mahofa is a post-doctoral research fellow in the school of economics at the University of Cape Town. Chrispen Sukume is an economist at the Livestock and Meat Advisory Council. Vine Mutyasira is a programme officer, policy quantitative modelling and data analytics with the Alliance for a Green Revolution in Africa.

This working paper is funded with UK aid from the UK Government (Foreign, Commonwealth and Development Office, formerly the Department for International Development). The opinions are the authors and do not necessarily reflect the views or policies of the Institute of Development Studies or the UK Government.

EXECUTIVE SUMMARY



Smallholder agricultural commercialisation has been seen as an important pathway out of rural poverty in developing countries. However, little empirical evidence is available in sub-Saharan Africa that examines the relationship between commercialisation pathways taken by farmers and welfare outcomes, such as farm income and asset accumulation. This paper fills this gap by taking advantage of data from two rounds of surveys conducted in 2018 and 2020 of smallholder farmers in Zimbabwe. We exploit the panel nature of the data and found that agricultural commercialisation through participation in tobacco and soyabean markets result in large increases in farm income. Participating in

soyabean markets only, tobacco only and food crop-based commercialisation (maize) also leads to large increases in farm income, but the magnitude of the increase is lower than that of those participating in both tobacco and soyabean markets. We find no evidence of the relationship between various commercialisation pathways and asset accumulation. Agricultural development policies that focus on increasing farm income and reducing poverty of rural households need to recognise the importance of improving farmer participation in output markets, particularly tobacco and soyabean, with a combination of strategies that increase productivity.

1. INTRODUCTION

Agricultural development is an important pathway out of rural poverty for many countries in sub-Saharan Africa, since the agricultural sector employs the majority of the rural workforce (World Bank, 2021). It is estimated that growth in the agricultural sector is two to four times more effective in raising incomes among the poorest compared to other sectors (World Bank, 2021). In sub-Saharan Africa, the number of poor people continue to rise, and it is the region with the highest poverty rate, despite the overall decline in poverty in recent years. Estimates show that the number of poor people continues to rise despite the poverty rate declining from 56 per cent in 1990 to 40 per cent in 2018 (World Bank, 2020). The poverty rate has not fallen fast enough to keep up with population growth in the region, and 433 million Africans were estimated to live in extreme poverty in 2018 – rising from 284 million in 1990. Commercialisation of smallholder agriculture, and the different pathways taken to get there, has been considered as one of the critical strategies for improving agricultural growth and consequently, contribute to poverty reduction. As countries and development organisations prioritise the importance of commercialising smallholder agriculture, a better understanding of the relationship between commercialisation pathways and poverty, and the channels through which commercialisation affect poverty – such as its relationships with agricultural income – should also remain a research priority.

It is not clear whether commercialisation of agriculture helps the poor. Some view commercialisation as important for agricultural growth and hence, improving employment opportunities and expanding incomes and food supply, all aspects which are important for poverty alleviation (von Braun and Binswanger, 1991). On the other hand, commercialisation can be harmful when it induces institutional and market failures (such as contract farming schemes that favour powerful contracting firms) that have adverse consequences for the poor (von Braun and Binswanger, 1991). There is a growing body of literature that examines the relationship between agricultural commercialisation and income and poverty, however, the results are mixed and not conclusive. Available empirical evidence has shown that smallholder agricultural commercialisation

is positively related with various measures of welfare and livelihoods outcomes (Govereh and Jayne, 2003; Masanjala, 2006; Muriithi and Matz, 2015; Carletto, Corral and Guelfi, 2017; Ogutu, Godecke and Qaim, 2020). On the other hand, Cazzuffia, McKay and Perge (2020) found that commercialisation had a positive and significant relationship with household asset accumulation, but a negative relationship with consumption expenditure in Vietnam. Additionally, Tankari (2017) showed that that production of cash crops in Senegal is associated with a reduction in welfare of smallholder farmers. There is also little evidence available that investigates the impacts of different commercialisation pathways adopted by farmers on income and asset accumulation. Yet, there is some evidence pointing to the fact that different commercialisation models, such as contract farming, plantations and medium-scale commercial farming, lead to different outcomes in terms of income and overall economic development, with contract farming showing a beneficial effect on poor rural farmers as compared to other models in Ghana (Yaro, Teye and Torvikey, 2017). Our study will take advantage of newly available panel data for rural households in Zimbabwe to examine the impacts of commercialisation on farm income and asset accumulation. Specifically, we seek to ask whether participating in tobacco and food crop markets improve farm incomes and asset accumulation of smallholder farmers in the Mvurwi and Concession areas of Zimbabwe.

Available empirical studies examining the relationship between commercialisation and welfare outcomes has been based on single cross-sectional survey data. The results from such analysis are likely biased however, due to omitted, unobserved household and regional characteristics likely related to both commercialisation and farm income, such as unmeasured managerial and entrepreneurial ability of farmers. Using two repeated rounds of surveys collected from the same households in 2018 and 2020, we are able to control for these unobserved factors. The availability of this data allows us to exploit the variation in changes in commercialisation and farm income over time to identify the relationship between commercialisation and farm income. Since it is assumed that participation

Table 1.1: Cropping patterns in Mvurwi and Concession

Crop	2017	2019
Proportion of households (%)		
Maize	98,23	97,48
Tobacco	66,13	60,54
Groundnut	30,00	28,11
Beans	16,61	19,64
Soyabean	31,77	25,23
Proportion of crop sold (%)		
Maize	52,10	33,95
Tobacco	99,65	100,00
Groundnut	25,37	27,31
Beans	50,20	31,08
Soyabean	79,94	54,87

Source: Authors' own

in output markets is likely to improve productivity and farm incomes, and adoption of lucrative export cash crops such as tobacco is likely to generate more income, our main hypothesis is that the tobacco-based commercialisation pathway will lead to higher incomes and greater asset accumulation as compared to the food-based commercialisation pathway.

Mvurwi and Concession have high numbers of private-sector contracting companies, bulk traders, and aggregators (for example maize, soyabean and horticulture products); links to auction markets (for tobacco); and local spot markets (for horticulture and maize). There is increased competition among traders and contracting companies for farm products, and we expect a greater number of households to engage with the various markets available. Table 1.1 shows that the main crops grown in Mvurwi and Concession are maize

and tobacco, followed by soyabean and groundnuts. The majority of farmers in Concession grow maize and soyabeans, which is mainly driven by the type of soil in the region – red clay. Soyabean has also emerged as a key cash crop for Concession farmers. Mvurwi has sandy soils suitable for tobacco production. In addition, historically, Mvurwi has been an area where tobacco production was the major agricultural activity and resettled small-scale farmers also continued with tobacco production – taking advantage of the available skills and knowledge gained from the former large-scale white settler farmers. The region has seen a rapid growth in tobacco production as the dominant commercial crop since 2007 due to engagement with various marketing arrangements, including through contract farming and direct sales via auction floors (Scoones et al., 2018).

2. LITERATURE REVIEW

The relationship between agricultural commercialisation pathways and farm income and asset accumulation is not straightforward. Much of the literature supports the notion that agricultural commercialisation increases asset accumulation and income, and consequently reduces poverty. On the other hand, von Braun and Binswanger (1991) note various ways in which commercialisation can be both harmful and beneficial to the poor. For instance, commercialisation can be harmful if, first, it leads to the decline of agricultural prices, given the inelastic demand for most farm products. Prices decline with production expansion and a flooding of the market with agricultural commodities. Such declines reduce the gains from commercialisation for producers.

The commercialisation of cash crops, such as tobacco, can also be harmful to the poor by driving up local food prices in both adopting and non-adopting regions. This happens when production of food crops is displaced by the cash crops, which leads to food shortages and price increases. The poor are more affected in this instance since they have to buy food at higher prices. Finally, commercialisation has also been associated with coerced production. For example, when powerful contracting firms are trying to capture excessive profits by enticing farmers into contract farming schemes, as is the case with tobacco farming. Since the poor, rural farmers usually hold a very weak negotiating position, they are particularly vulnerable to price manipulations of their final product.

In terms of the benefits for the poor, von Braun and Binswanger (1991) argue that commercialisation is important for poverty-alleviating agricultural growth. Regions where the majority of farmers produce crops for sale are better off than regions under subsistence production. Participation in output and input markets is also associated with interactions that improve information and knowledge sharing among farmers, which is important for improving agricultural productivity and income growth. Increased incomes realised from crop sales help reduce poverty at commercialised farms and commercialised farms demand more labour, which, in turn, creates employment opportunities for the poor and landless to sell their labour for cash.

Empirical studies have shown that the adoption of cash crops helps to increase overall agricultural productivity in the household, since increased incomes from the sale of cash crops may be used to acquire inputs for the production of other crops (Govere and Jayne, 2003). Similarly, Masanjala (2006) showed that households that grow cash crops (tobacco) had higher incomes than those that did not grow cash crops.

Recent empirical evidence has also shown that agricultural commercialisation is positively associated with income, asset accumulation and poverty reduction. For instance, Muriithi and Matz (2015), use panel data to show that smallholder horticultural commercialisation in Kenya is positively associated with household welfare – the effect differing depending on which market channels are used. Horticultural commercialisation through the export market is found to be positively associated with income (not wealth), whereas there is little evidence for the domestic marketing channel positively influencing either income or asset accumulation.

Other related studies using data from 805 farm households in Kenya show that commercialisation reduces both income poverty and multidimensional poverty (Qaim and Ogutu, 2019). In another related study in China, Meng et al. (2020) found that cash crop cultivation has a positive and statistically significant impact on household income. Cazzuffia, McKay and Perge (2020) show that there is a significant and positive relationship between commercialisation of smallholder agriculture in Vietnam and household asset accumulation, but a negative association with consumption expenditure. Similar evidence has also shown in Senegal, where the production of cash crops is associated with a reduction in welfare of smallholder farmers (Tankari, 2017).

These results suggest that, in some cases, commercialisation may reduce welfare, but most studies support the idea that commercialisation improves the welfare of farm households. Further, Zhou, Minde and Mtigwe (2013), for instance, note that while some negative welfare effects can emerge, the expected positive income effects of commercialisation at the household and community level are greater.

Other studies have examined the effects of particular forms of commercialisation such as contract farming, and found smallholder farm households participating in contract farming to enjoy higher levels of welfare (Barrett et al., 2012; Bellemare, 2012). On the other hand, Meemken and Bellemare (2020), using nationally representative data from six countries, show that contract farming increased household incomes only in some countries, casting doubt on earlier findings that show that contract farming increases income unambiguously. The majority of studies examining the relationship between commercialisation and household income have relied on cross-sectional data and results from such are likely to be biased. This is because they are not able to control for unobserved shocks (such as unmeasured managerial and entrepreneurial ability) that are jointly related to commercialisation and welfare outcomes. Some cross-sectional studies have controlled for endogeneity using instrumental variables (Tankari, 2017; Bellemare, 2012) and few panel data

studies have employed fixed effect estimates (Muriithi and Matz, 2015).

Studies that use panel data, including those that exploit the changes in commercialisation and welfare outcomes over time, are rare. We do this by controlling for time-invariant unobserved characteristics. Our study examines the extent to which smallholder commercialisation, based on tobacco and food crops such as soyabeans and maize, impacts rural farm incomes and other welfare outcomes such as asset accumulation. To examine the potential of cash and food crop commercialisation as an important strategy to reduce poverty, there is need for consistent estimation of the livelihood impacts of smallholder commercialisation. Issues arising from whether to participate or not in commercialisation need to be addressed. Our study attempts to do this with the help of panel data by controlling for time-invariant unobserved characteristics across farmers.

3. DATA AND METHODS

3.1 Survey and sample description

To examine the impacts of different commercialisation pathways on farm income and asset accumulation, we use two rounds of survey data collected in April 2018 (reflecting the 2016 to 2017 growing season) and December 2020 (reflecting the 2019 to 2020 growing season). Since the target population for the study was small-scale farmers from Mazowe District, purposive sampling of farm schemes (villages) and household in each of the two regions was done with the assistance of extension officers – so as to reflect a balanced, holistic picture of the different farming systems, farmer gender, and a sufficient geographical spread. A1 resettlement farmers are beneficiaries of the country's fast track land reform programme in 18 resettled former large-scale commercial farms. Under the land reform programme, each household was allocated about 5ha of land to pursue agricultural livelihoods.

We selected the Mvurwi area to represent the northern part of the district and because this area has a higher population of A1 farmers. Tobacco production is common due to the suitability of the sandy soils. We chose 11 farming schemes (former large-scale commercial farms) to capture a good geographical representation of the area. In the south-east part of the district, we selected Concession; the western part of the region is more populated by larger A2 farms. Concession has fewer A1 farms than Mvurwi and is characterised by red clay soils that are suitable for soyabean and maize production. We selected seven farming schemes in Concession – also making sure to capture a sufficient geographical spread.

Households were selected in each scheme with the assistance of extension officers and local leadership by also taking into consideration the need for geographical representation and gender within the farming schemes. Data was collected from 620 households in the first survey in 2018 to gather information on the production and marketing of various crops, agricultural production, household demographics, land ownership and use, household assets including livestock and agricultural assets, off-farm income, food security indicators, remittances,

market access and market characteristics, access to credit, and women empowerment. In a follow up survey in 2020, 555 households were interviewed – the list of farming schemes and the total number of households interviewed can be found in Table A1 in the Annex. Across the two rounds, 533 household responses matched. We use the information gathered from both rounds to create our main outcome variable and explanatory variables of interest.

3.2 Commercialisation pathway indicators

Our household commercialisation indicators use dummy variables that capture whether a household sold a particular crop or not. This is created from a variable that asks households whether they sold any crop. Five dummy variables were created, 1) Sell tobacco only ($TbCom_{it}$) – identifying households that sold tobacco only and not any other crop; 2) Sell soyabean only ($SyCom_{it}$) – identifying households that sold soyabeans only and not any other crop; 3) Sell soyabeans and tobacco (Tb_SyCom_{it}) – identifying households that sold both soyabeans and tobacco only; 4) No tobacco and soyabeans ($NoTbSyCom_{it}$) – identifying households that sold maize only; and 5) No sale ($NoSale_{it}$) – identifying households that did not sell anything, that is, subsistence farmers.

3.3 Income, poverty and asset accumulation indicators

Our measure of farm income is the value of agricultural production obtained using sales prices reported by farmers. However, this may be an underestimate/overestimate of the true value of farm income since we do not take into consideration some costs of taking products to the market. For asset accumulation, we use total value of assets owned as reported by households.

4. EMPIRICAL APPROACH

To estimate the relationship between agricultural commercialisation pathways and income and asset accumulation, we specify and estimate the following panel regression equation;

$$Y_{it} = \theta + \gamma_1 TbCom_{it} + \gamma_2 SyCom_{it} + \gamma_3 Tb_SyCom_{it} + \gamma_4 NoTbSyCom_{it} + \gamma_5 NoSale_{it} + x_{it}\beta + \alpha_i + \tau T + \mu_{it} \quad (1)$$

$i=1,2,\dots,N; t=0,1;$

The dependent variable (Y_{it}) will be an indicator of income or asset accumulation and the explanatory variables of interest are household commercialisation pathways ($TbCom_{it}, SyCom_{it}, Tb_SyCom_{it}, NoTbSyCom_{it}, NoSale_{it}$) as defined above. θ is an intercept. Our empirical strategy employs methods that will help to solve the problem of endogeneity arising from omitting important variables. Endogeneity will be minimised by the use of household fixed effects (α_i) and time effects (T) in the panel data. Household fixed effects will allow us to control for time-invariant unobserved effects and time effects will allow us to control for economic shocks that are common to all households. A question that may arise is what if the unobserved factors are time varying. We try to solve this by including a wide range of time varying control variables (x_{it}) that are available at both household and scheme/community level.

We also control for factors that are related to farm income, including area cultivated, rainfall, livestock type, number of adults in a household, extension contact, education, measure of hired labour, number of cattle, tractor use, inputs expenditure, contract farming and distance to markets.

The amount of crop output produced is directly related to area planted and quality of the land. The amount of rainfall received in the season and region also has a direct impact on crop production. Labour and skills are an important input in agricultural production and are expected to have a positive influence on farm incomes. We capture this by using hired labour man-days; the number of adults in a household, that is, those household members above 15 and below 60 years; access to extension and years of schooling are included to capture skill level.

Productive capital such as draft animal and working capital to purchase inputs such as seeds and chemicals are important for improving agricultural productivity and income. We capture this by including variables such as number of cattle owned by the household, use of tractor services, expenditure on inputs (seeds and chemicals), and a variable identifying whether the household is engaged in contract farming or not.

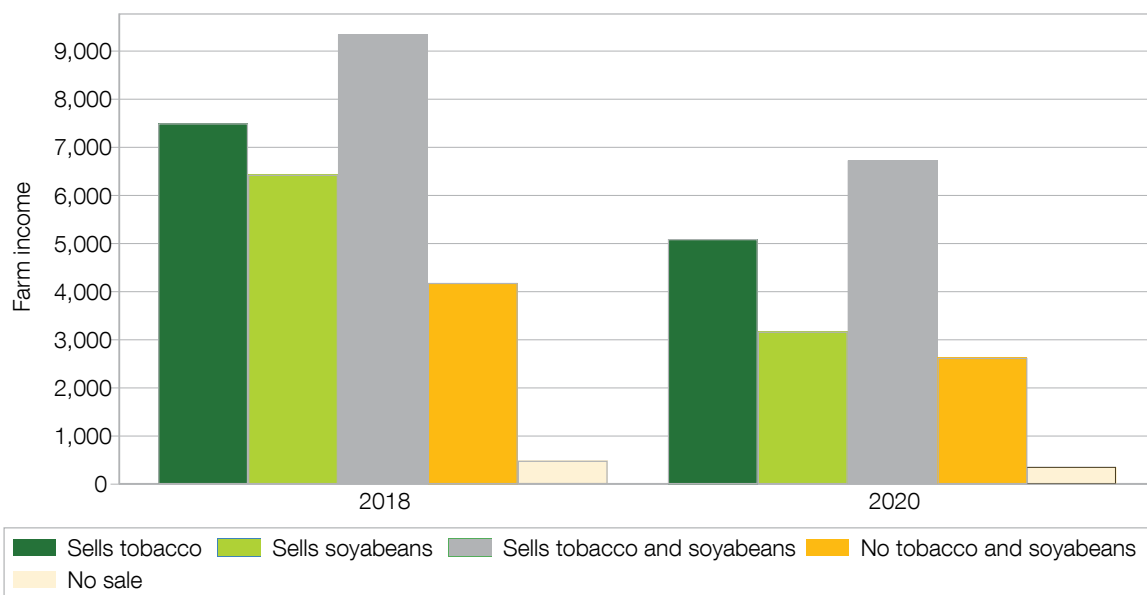
5. DISCUSSION OF RESULTS

We begin by examining the differences in agricultural income and asset accumulation by commercialisation pathway. Figure 5.1 shows the patterns of agricultural income by whether a household sells tobacco, soyabeans, both tobacco and soyabeans, does not sell tobacco and soyabeans and does not sell anything (subsistent) over the two study periods. As expected, results show that annual household farm income was highest for households that sold both tobacco and soyabeans in both survey periods. Those households that sold tobacco only received farm incomes higher than those obtained by households who sold soyabeans only, and those who sold maize only. Households who did not sell any crops did receive a low farm income, probably from the sale of livestock and livestock products. This pattern is consistent over the two study periods and is not surprising because tobacco and soyabeans have high returns – as compared to other crops in the study area. The results are also in line with our earlier discussion and literature findings that adoption of cash crops is associated with higher income. We notice from Figure 5.1 that overall farm income declines between the two study periods; this may be due to the drought season of 2019/2020, during which the majority of farmers suffered crop losses and their crop revenue was eroded.

The low farm income of the 2019/2020 season is further depicted in Figure 5.2, which shows kernel density functions for 2018 and 2020. The kernel density estimates reveal a leftward shift of the entire distribution over the two time periods, which implies a decrease in the median income. The extremely left-skewed shape of the distribution points to the fact that only very few households received an income lower than the lower and middle class and hence, there is a gap in the income distribution.

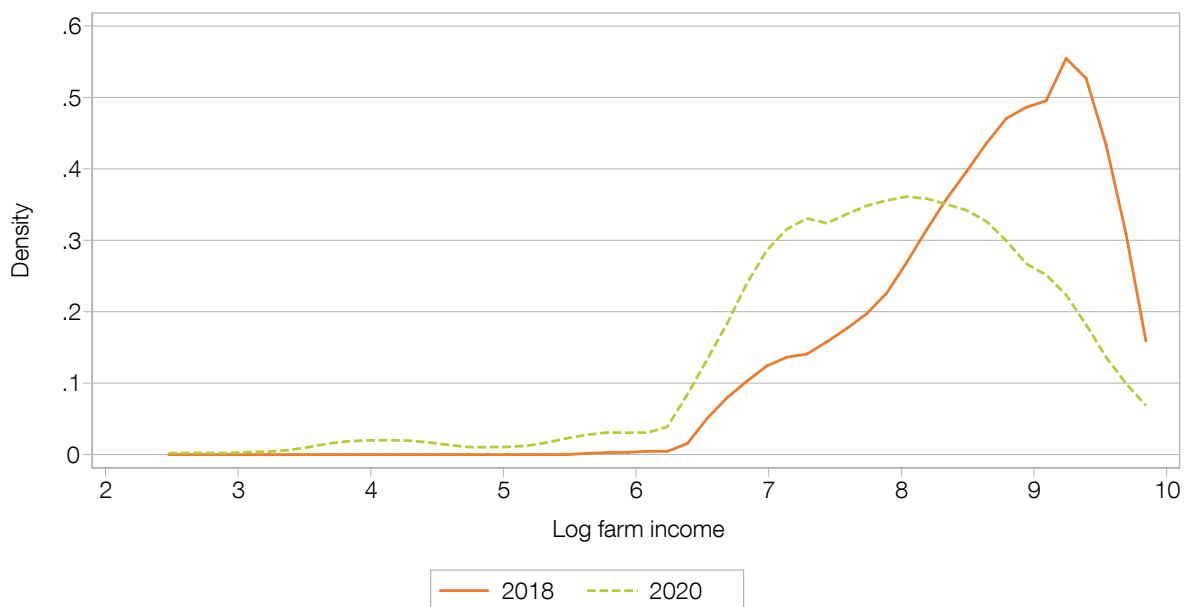
Figure 5.3 shows the differences in total asset values owned by households and their commercialisation pathways across the two study periods. The results are not different from those of annual agricultural income – we see that households that sell tobacco and soyabean own the most highly-valued assets followed by households that sell tobacco only. Households that do not sell any crops own less-valuable assets. This pattern of difference in asset values across commercialisation pathways is similar for both survey years.

Figure 5.1: Annual farm income (US\$), 2018 and 2020



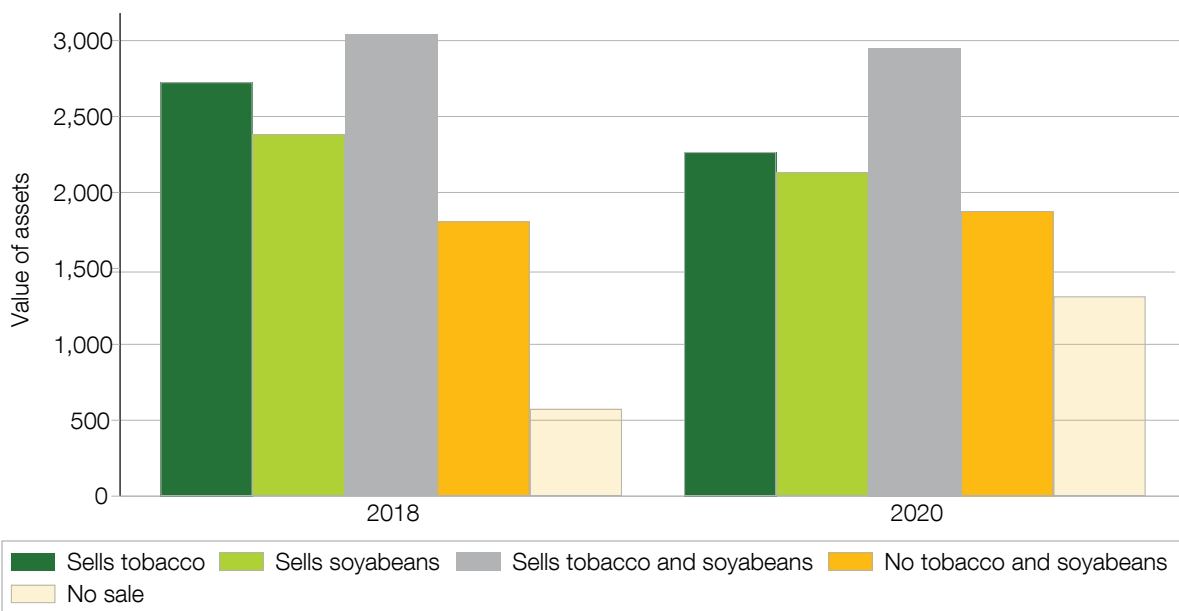
Source: Authors' own

Figure 5.2: Log farm income density functions



Source: Authors' own

Figure 5.3: Asset value (US\$), 2018 and 2020



Source: Authors' own

5.1 Household characteristics

Table 5.1 shows household characteristics by region and gender over the two time periods. We notice that, of the total households in 2018, 57 per cent sold tobacco only, 15 per cent sold soyabeans only, 12 per cent sold tobacco and soyabeans, 14 per cent did not sell tobacco and soyabeans (sold maize only), and 2 per cent did not sell anything. In 2020, 54 per cent sold tobacco only, 10 per cent sold soyabeans only, 6 per cent sold tobacco and soyabeans, 20 per cent

did not sell tobacco and soyabeans, and 10 per cent did not sale anything. More people were pushed into subsistence in 2020 because of the drought.

In 2018, 71 per cent of the Mvurwi households sold tobacco and 4 per cent sold soyabeans whereas in Concession, 27 per cent sold tobacco and 40 per cent sold soyabeans. This highlights that the main crop for commercialisation in Mvurwi is tobacco whilst in Concession, its soyabeans, as noted earlier in this paper. In both regions in 2018, about 60 per cent of

the male-headed households sold tobacco compared to 42 per cent of female-headed households, whereas in 2020, 58 per cent of male-headed households sold tobacco compared to 37 per cent of their female counterparts. In 2018, 29 per cent of female-headed households did not sell tobacco and soyabeans and similarly, in 2020, 30 per cent of female-headed households did not sell tobacco and soyabeans. This suggests that female-headed households are likely to be involved in selling food crops, such as maize, and are less involved in cash crop commercialisation.

In terms of household characteristics, results show that in Concession, there are more older households and female-headed households are older. The proportion of households with children out of school declined from 14 per cent in 2018 to 11 per cent in 2020. Household heads in Mvurwi and male-headed households in both areas have slightly more years of schooling. Household size was higher for farmers in Mvurwi and for male-headed households in both areas. The number of productive adults in a household was higher in male-headed households in both areas and across both survey rounds. Male-headed households and the majority of households in Mvurwi grow a variety of crops.

The proportion of households with a member working for a wage is high in Concession (16 per cent and 13 per cent in 2018 and 2020 respectively) and among male-headed households for both areas (15 per cent and 11 per cent in 2018 and 2020 respectively). Results from the table also show that households in Mvurwi own high-value production assets¹ as compared to those in Concession across all the survey years. In terms of gender, male-headed households have on average higher value production assets compared to female-headed households across the two regions and survey years. Households in Concession own consumption assets² that are of high value as compared to those households in Mvurwi across all survey years. Farm income was higher in Concession than Mvurwi in 2018, whilst Mvurwi reported the higher farm income in 2020.

Male-headed households reported the highest farm income in both areas. Spending on inputs was higher in Mvurwi than Concession and among male-

headed households for both areas. Male-headed households hired more labour; the majority of farmers in Concession and male-headed households in both areas used tractors; and the area planted was higher in Concession and in male-headed households for both areas.

5.2 Econometric results

Table 5.2 presents pooled Ordinary Least Squares results of our specification in equation 4 for different outcome variables. Column one present results for farm income and column two shows results for asset accumulation measured by total value of assets. The dependent variables are transformed to natural logarithms. Results in Table 5.2 assume that agricultural commercialisation is exogenous, that is, the choice to produce crops for the market is independent of any other factors that are jointly related to commercialisation and welfare outcomes. So, we pooled data for households over the two survey rounds of 2018 and 2020. In this case, we are just using the cross-sectional variation in commercialisation across households to explain the relationship between commercialisation and various welfare outcomes.

Our results show that commercialisation pathways are related to farm income but not to asset accumulation. Looking at the different commercialisation pathways, we notice that the cash crop-based commercialisation pathway – those selling tobacco and soyabeans – has a higher impact on farm income, followed by those who sell tobacco only, and then soyabeans only. Results for other characteristics show that spending on inputs, number of cattle owned, rainfall and area planted have positive and statistically significant relationships with farm income. However, these results suffer from bias since there are some confounding factors that may be related to commercialisation pathway and welfare outcomes. These unobserved confounding factors may include some abilities and skills of farm households we are not able to measure such managerial and entrepreneurial ability.

In Table 5.3, we present and discuss results from fixed effect estimation of equation 4. In this estimation, we use both the cross-sectional and time variation in commercialisation and farm income to address the problem of endogeneity arising from omitted variables.

1 Production assets include hoe, spade, axe, sickle, shears, knife, animal cart, plow/harrow, sprayer, water pump and tractor.

2 Consumption assets comprise mattress, stove, radio, television, telephone/landline, mobile phone, fridge, bicycle, motorcycle and car/truck.

Table 5.1: Selected household characteristics

	2018					2020				
	Total	Mvurwi	Concession	Female	Male	Total	Mvurwi	Concession	Female	Male
Sells tobacco	0.57	0.71	0.27	0.42	0.60	0.54	0.63	0.34	0.37	0.58
Sells soyabean	0.15	0.04	0.40	0.19	0.15	0.10	0.03	0.24	0.17	0.08
Sells tobacco and soyabean	0.12	0.07	0.24	0.09	0.13	0.06	0.05	0.09	0.01	0.08
Does not sell soyabean or tobacco	0.14	0.16	0.09	0.29	0.11	0.20	0.21	0.18	0.30	0.18
Subsistence	0.02	0.02	0.01	0.01	0.02	0.10	0.07	0.16	0.15	0.09
Household with children out of school	0.14	0.15	0.11	0.13	0.14	0.11	0.11	0.11	0.13	0.10
Age of household head	51.66	50.51	54.24	55.83	50.86	53.37	52.11	56.18	56.91	52.61
Years of schooling of head	8.89	8.95	8.76	7.03	9.25	9.15	9.21	9.02	7.22	9.57
Monogamously married	0.77	0.77	0.79	0.12	0.90	0.74	0.75	0.73	0.12	0.88
Female-headed household	0.16	0.17	0.15	1.00	0.00	0.18	0.18	0.16	1.00	0.00
Household size	6.14	6.20	5.99	5.53	6.25	6.20	6.22	6.17	5.77	6.30
Number of adults in household	3.54	3.55	3.51	3.17	3.61	3.58	3.57	3.61	3.33	3.64
Distance to market	29.89	30.67	28.04	23.88	30.87	21.60	19.66	25.68	23.15	21.24
Poultry	19.52	19.26	20.13	14.82	20.45	25.02	24.58	26.03	18.70	26.25
Crop count	2.68	2.77	2.46	2.51	2.71	2.51	2.60	2.30	2.34	2.54
Tropical livestock units	5.96	5.71	6.55	3.96	6.36	5.41	4.83	6.76	3.85	5.74
Household member working for wage	0.14	0.13	0.16	0.07	0.15	0.10	0.09	0.13	0.07	0.11
July–June total rainfall (mm) current season	723.33	712.71	747.01	723.00	723.39	572.08	578.03	558.80	582.00	570.02
Value of production assets	736.60	739.41	730.34	583.66	766.03	581.31	582.71	578.19	425.63	616.03
Value of consumption assets	1920.69	1888.17	1993.22	1290.50	2041.93	1572.41	1540.14	1644.39	1143.55	1673.45
Annual farm income	7069.09	6954.10	7322.22	5490.60	7374.03	4147.12	4337.38	3708.90	2947.99	4420.26
Per adult male equivalent annual farm income	1660.13	1579.88	1836.79	1600.60	1671.63	946.22	967.29	897.69	783.66	985.98
Household commercialisation index	84.82	85.07	84.28	79.63	85.83	81.45	82.51	78.83	73.46	83.03

	2018					2020				
	Total	Mvurwi	Concession	Female	Male	Total	Mvurwi	Concession	Female	Male
Maize commercialisation index	25.06	21.76	32.47	32.24	23.65	29.01	26.22	35.05	34.56	27.84
Tobacco commercialisation index	68.92	70.78	62.50	66.91	69.19	75.44	76.67	70.99	79.80	74.81
Soyabean commercialisation index	23.37	12.73	28.11	26.31	22.79	23.87	16.91	27.95	26.43	22.26
Total spending on inputs	1887.66	1917.46	1821.37	1444.57	1973.10	1511.43	1560.07	1402.59	1187.48	1588.00
Cattle owned	6.60	6.77	6.21	5.01	6.90	5.89	5.59	6.56	4.59	6.17
Hired labour days	24.68	24.27	25.61	20.59	25.47	16.46	17.42	14.30	9.85	18.02
Tractor tillage use (1=Yes)	0.57	0.49	0.75	0.49	0.59	0.44	0.38	0.57	0.41	0.44
Engaged in contract farming (1=Yes)	0.39	0.33	0.52	0.31	0.40	0.54	0.57	0.48	0.37	0.58
Access to extension (1=Yes)	0.86	0.82	0.94	0.87	0.85	0.87	0.89	0.85	0.88	0.87
Access to credit (1=Yes)	0.13	0.13	0.12	0.13	0.13	0.04	0.03	0.06	0.08	0.03
Area planted (hectares)	3.75	3.50	4.31	3.53	3.80	3.59	3.45	3.89	3.23	3.67
Number of households	533	368	165	86	447	533	368	165	94	435

Source: Authors' own

Household fixed effects allows us to control for unobserved time-invariant factors that may be related to farm income, and time fixed effects allow us to control for shocks that are common to all households. Our results still show that commercialisation is positively related to farm income, but no relationship with asset accumulation.

In terms of commercialisation pathways, we note that the cash crop-based commercialisation pathway is positively associated with farm income and the result is statistically significant. Selling tobacco and soyabeans only will lead to increases in farm income by 194 per cent, all else being equal. This implies that selling tobacco and soyabeans will increase average farm income over the two study periods from US\$5,626.42 to US\$16,541.67. Selling soyabeans only will increase farm income by 193 per cent, suggesting that average farm income will increase from US\$5,626.42 to US\$16,485.42. Selling tobacco only will increase income by 177 per cent (average farm income will increase from US\$5,626.42 to US\$15,585.19), whereas for those who sell maize only, farm income will increase

by 151 per cent (average farm income will increase from US\$5,626.42 to US\$14,122.31).

These results imply that commercialisation through tobacco and soyabeans, which are the main cash crops in the region of study, will lead to increases in income by a higher magnitude as compared to other pathways. This finding is consistent with findings from earlier literature, which shows that adoption of cash crops will lead to increases in income by a higher magnitude as compared to other pathways. This finding is consistent with findings from earlier literature, which shows that adoption of cash crops will lead to increases in smallholder farmers income (Masanjala, 2006; Muriithi and Matz, 2015; Meng et al., 2020).

The relationship between farm income and other household characteristics is also shown in Table 5.3. Holding other things constant, spending on inputs has a positive and statistically significant effect on farm incomes. The results suggest that a unit increase in spending on inputs will increase farm incomes by 0.042 per cent. For example, if a farmer spends an additional

Table 5.2: Impact of commercialisation on income and asset accumulation

	Log farm income	Log asset value
	(1)	(2)
Sells tobacco only (1=Yes)	2.124***	0.0149
	(0.172)	(0.114)
Sells soyabean only (1=Yes)	2.072***	0.00951
	(0.157)	(0.133)
Sells tobacco and soyabean (1=Yes)	2.225***	-0.0495
	(0.195)	(0.120)
Does not sell tobacco or soyabean (1=Yes)	1.820***	-0.0532
	(0.209)	(0.110)
Spending on inputs	0.000423***	0.000277***
	(0.0000314)	(0.0000553)
Years of schooling of household head	0.00115	0.0215
	(0.00661)	(0.0131)
Number of adults	0.0102	0.0684***
	(0.00834)	(0.0221)
Cattle owned	0.0212***	0.0442***
	(0.00256)	(0.00452)
Hired labour days	0.000511	0.000765
	(0.000716)	(0.00113)
Used tractor for tillage (1=Yes)	0.0146	0.113*
	(0.0463)	(0.0555)
Engaged in contract farming	0.0932	0.164*
	(0.0664)	(0.0913)
Access to extension (1=Yes)	-0.0132	-0.213*
	(0.0811)	(0.112)
Log of July–June total rainfall (mm)	1.213***	0.771***
	(0.182)	(0.205)
Log of distance to market (km)	-0.0185	-0.000575
	(0.0371)	(0.0378)
Log of area planted	0.202***	0.243***
	(0.0444)	(0.0599)
Constant	-2.557*	0.758
	(1.220)	(1.316)
Number of observations	793	811
R-squared	0.757	0.411

Notes: Sample is restricted to households who appeared in both rounds. Robust standard errors clustered at the farm scheme level (we have 18 farm schemes) in parentheses (* p<0.10, ** p<0.05, *** p<0.010).

Source: Authors' own

Table 5.3: Impact of commercialisation on farm income and asset accumulation-fixed effects estimates

	Log farm income	Log asset value
	(1)	(2)
Sells tobacco only (1=Yes)	1.772***	0.0219
	(0.257)	(0.160)
Sells soyabeans only (1=Yes)	1.925***	-0.00785
	(0.256)	(0.138)
Sells tobacco and soyabeans (1=Yes)	1.944***	0.126
	(0.302)	(0.216)
Does not sell tobacco or soyabeans (1=Yes)	1.510***	0.00354
	(0.223)	(0.152)
Spending on inputs	0.000418***	0.000111
	(0.0000403)	(0.0000769)
Years of schooling of household head	0.00434	0.00309
	(0.0219)	(0.0264)
Number of adults	0.0180	0.0150
	(0.0263)	(0.0295)
Cattle owned	0.0126	0.0238
	(0.0129)	(0.0143)
Hired labour days	0.00141	0.00120
	(0.00153)	(0.00113)
Used tractor for tillage (1=Yes)	0.108	0.242**
	(0.0880)	(0.108)
Engaged in contract farming	0.0716	0.133
	(0.0842)	(0.0896)
Access to extension (1=Yes)	0.101	0.0799
	(0.0818)	(0.112)
Log of July–June total rainfall (mm)	-0.413	0.609
	(0.646)	(0.454)
Log of distance to market (km)	-0.0327	-0.0265
	(0.0243)	(0.0526)
Log of area planted	0.107**	0.0308
	(0.0434)	(0.123)
Constant	8.159*	2.977
	(4.409)	(3.265)
Number of observations	793	811
R-squared	0.686	0.189

Notes: Sample is restricted to households who appeared in both rounds. All estimates include household and year fixed effects. Robust standard errors clustered at the farm scheme level (we have 18 farm schemes) in parentheses (* p<0.10, ** p<0.05, *** p<0.010)

Source: Authors' own

US\$50 on inputs, average farm income will change by US\$118.

An increase in area planted is also positively associated with farm incomes and the result is statistically significant. A 10 per cent increase in area planted, for instance, will increase farm incomes by 1.1 per cent, and the results suggest that if average area planted is increased by 1ha, average farm income will increase by US\$167.10.³ The results also show that the association

between other household characteristics and farm income are not statistically significant, suggesting that there is no relationship between these variables and farm income. In terms of asset accumulation, our results show that commercialisation pathways are not associated with asset accumulation as all the coefficients are statistically insignificant. Only tractor use has a positive and statistically significant relationship with asset accumulation.

³ Given that average area planted is 3.66ha and an increase by a hectare corresponds to a 27 per cent increase, the increase in farm income is 27×0.11 (2.97 per cent).

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

The main objective of this study was to investigate the relationship between smallholder agriculture commercialisation and farmers' economic wellbeing – to shed some light on the ongoing debate as to whether or not commercialisation may be an engine of agricultural growth that can help reduce poverty in sub-Saharan African countries. The main contribution of this study is the use of panel data to exploit both the cross-sectional and time variation in commercialisation and welfare outcomes, such as farm income and asset accumulation. We also contribute to the literature by investigating the effects of smallholder commercialisation through different pathways, such as food crop-based (maize) and cash crop-based (tobacco and soyabeans) on income and asset ownership in Zimbabwe.

Our results show that commercialisation of Zimbabwean smallholder agriculture through participation in tobacco and soyabeans markets leads to higher smallholder farm incomes, but is not related to asset accumulation. Overall, we conclude that smallholder agricultural commercialisation, through these particular markets, has a higher impact on household welfare outcomes, such as income, than other markets, and the effect is economically significant. We also find evidence of

increasing income for those participating in soyabean only, tobacco only and maize only commercialisation pathways, although the effect is smaller than that of those participating in both tobacco and soyabean markets. Our findings that participation in lucrative markets for cash crops increases farm income is in line with earlier literature findings, as well as anecdotal evidence highlighting the importance of cash crops in improving incomes and consequently, reducing poverty.

Agricultural development policies that focus on reducing poverty of rural households need to recognise the importance of improving participation of farmers in output markets, particularly tobacco and soyabean markets. This should also be combined with strategies that improve the performance and efficiency of agricultural output markets. Tobacco is the main cash crop used as a pathway for agricultural commercialisation among smallholder farmers in the study area, given that the crop is highly profitable. However, given the changes in global market conditions with regards to the health implications of tobacco, it might be prudent for the government to explore other viable crop diversification options.

REFERENCES

- Barrett, C.B., Bachke, M.E., Bellemare, M.F., Michelson, H.C., Narayanan, S. and Walker, T.F. (2012) 'Smallholder participation in contract farming: comparative evidence from five countries', *World Development* 40(4): 715-730.
- Bellemare, M.F. (2012) 'As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming', *World Development* 40(7): 1418-1434.
- Biyase, M. and Zwane, T. (2018) 'An empirical analysis of the determinants of poverty and household welfare in South Africa', *The Journal of Developing Areas* 52(1): 115-130.
- von Braun, J. (1995) 'Agricultural commercialization: impacts on income and nutrition and implications for policy', *Food Policy* 20(3): 187-202.
- von Braun, J., and Binswanger, H. (1991) 'Technological Change and Commercialization in Agriculture: The Effect on the Poor', *The World Bank Research Observer* 6(1): 57-80.
- Carletto, C., Corral, P. and Guelfi, A. (2017) 'Agricultural Commercialization and Nutrition Revisited: Empirical Evidence from Three African Countries', *Food Policy* 67: 106-118.
- Cazzuffia, C., McKay, A. and Perge, E. (2020) 'The impact of agricultural commercialisation on household welfare in rural Vietnam', *Food Policy* 94: 101811.
- Govere, J. and Jayne, T.S. (2003) 'Cash Cropping and Food Crop Productivity: Synergies or Trade-Offs', *Agricultural Economics* 28(1): 39-50.
- Masanjala, W.H. (2006) 'Cash crop liberalization and poverty alleviation in Africa: evidence from Malawi', *Agricultural Economics* 35(2006): 231-240.
- Meemken, E.-M. and Bellemare, M.F. (2020) 'Smallholder farmers and contract farming in developing countries', *Proceedings of the National Academy of Sciences* 117(1): 259-264.
- Meng, L., Gan, C., Ma, W. and Jiang, W. (2020) 'Impact of cash crop cultivation on household income and migration decisions: Evidence from low-income regions in China', *Journal of Integrative Agriculture* 19(10): 2571-2581.
- Muriithi, B.W. and Matz, J.A. (2015) 'Welfare Effects of Vegetable Commercialization: Evidence from Smallholder', *Food Policy* 50: 80-91.
- Ogotu, S.O., Godecke, T. and Qaim, M. (2020) 'Agricultural Commercialisation and Nutrition in Smallholder Farm Households', *Journal of Agricultural Economics* 71(2): 534-555.
- Qaim, M. and Ogotu, S.O. (2019) 'Commercialization of the small farm sector and multidimensional poverty', *World Development* 114(2019): 281-293.
- Scoones, I., Mavedzenge, B., Murimbarimba, F. and Sukume, C. (2018) 'Tobacco, contract farming, and agrarian change in Zimbabwe', *Journal of Agrarian Change* 18(1): 22-42. <https://doi.org/10.1111/joac.12210>.

Tankari, M.R. (2017) 'Cash crops reduce the welfare of farm households in Senegal', *Food Security* 9: 1105-1115. doi:10.1007/s12571-017-0727-6

Tavares, F. and Betti, G. (n.d.) *Vulnerability, poverty and COVID-19: risk factors and deprivations in Brazil*. Preliminary briefing. Available at: https://www.researchgate.net/publication/340660228_Vulnerability_Poverty_and_COVID-19_Risk_Factors_and_Deprivations_in_Brazil (Accessed: 20 August 2021).

World Bank (2020) *Poverty and Shared Prosperity 2020: Reversals of Fortune*. Washington DC: World Bank.

World Bank (2021) 'Agriculture and Food', *World Bank* [online], 4 October. Available at: <https://www.worldbank.org/en/topic/agriculture/overview#1> (Accessed 20 September 2021).

Yaro, J.A., Teye, J.K. and Torvikey, G.D. (2017) 'Agricultural commercialisation models, agrarian dynamics and local development in Ghana', *The Journal of Peasant Studies* 44(3): 538-554.

Zhou, S., Minde, I.J. and Mtigwe, B. (2013) 'Smallholder agricultural commercialization for income growth and poverty alleviation in southern Africa: A review', *African Journal of Agricultural Research* 8(22): 2599-2608.

APPENDIX

Table A1: List of schemes and total sample in 2017

Region	Scheme	Sample
Concession	A of Cranham Extension	39
	Cranham Extension	7
	Ardura	29
	Barwick M	27
	Falling Waters	26
	Glegrey	48
	Glendevon	32
	Total	208
Mvurwi	Blighty	30
	Chipanza	33
	Edmonston	26
	Forrester J	27
	Forrester K	33
	Four Streams	45
	Lucknow Estate	37
	Lucknow Extension	34
	Omeath B	64
	Omeath E	31
	Stockbury	52
	Total	412
Total sample		620

Source: Authors' own

Mahofa, G., Mutyasira, V. and Sukume, C. (2022) *Impact of Commercialisation Pathways on Income and Asset Accumulation: Evidence from Smallholder Farming in Zimbabwe*. APRA Working Paper 89. Brighton: Future Agricultures Consortium.

© APRA 2022

ISBN: 978-1-78118-980-1

DOI: 10.19088/APRA.2022.024



This is an Open Access report distributed under the terms of the Attribution-Non Commercial-No Derivs 4.0 Unported (CC BY-NC-ND 4.0) Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. NonCommercial — You may not use the material for commercial purposes. NoDerivatives — If you remix, transform, or build upon the material, you may not distribute the modified material. You are free to: Share — copy and redistribute the material in any medium or format.

<https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode>

If you use the work, we ask that you reference the APRA website (www.future-agricultures.org/apra/) and send a copy of the work or a link to its use online to the following address for our archive: APRA, Future Agricultures Consortium, University of Sussex, Brighton BN1 9RE, UK (apra@ids.ac.uk)

All APRA Working Papers go through a review process before publication.



DO YOU HAVE COMMENTS ON THIS PAPER?

We would welcome your feedback on this working paper!

To provide brief comments, please follow this link to our short APRA Working Paper Feedback form: <https://goo.gl/forms/1iVnXhhrlGesfR9P2>

The Agricultural Policy Research in Africa (APRA) programme is a five-year research consortium.
APRA is funded with UK aid from the UK government and will run from 2016-2021.

The programme is based at the Institute of Development Studies (IDS), UK (www.ids.ac.uk), with regional hubs at the Centre for African Bio-Entrepreneurship (CABE), Kenya, the Institute for Poverty, Land and Agrarian Studies (PLAAS), South Africa, and the University of Ghana, Legon. It builds on more than a decade of research and policy engagement work by the Future Agricultures Consortium (www.future-agricultures.org) and involves new partners at Lund University, Sweden, and Michigan State University and Tufts University, USA.

Funded by



The views expressed do not necessarily reflect the UK government's official policies.