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Gender and Rural Livelihoods: Agricultural Commercialisation and Farm Non-Farm Diversification

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CFU	Conservation Farming Unit
FMF	Female-managed farm
MMF	Male-managed farm
NGO	Non-governmental Organisation
PPP	Purchasing power parity

1. INTRODUCTION[1]

The resurrection of smallholder-based development approaches in the early 2000s renewed a longstanding focus on small farmers after the lost decades of the 1980s and 1990s (Johnston and Mellor 1961; Ellis and Biggs 2001). Under the conceptual umbrella of 'pro-poor agricultural growth', inclusivity and agricultural commercialisation have become the guiding lights of policy agendas devoted to reforming African smallholder agriculture (Dorward, Kydd et al. 2004; World Bank 2007). Linking small farmers to agricultural output markets – whether domestic or global – constitutes a pivotal aspect of such approaches.

The possibilities of linking smallholders to markets rest on supply side as well as demand side factors, related to the production of a marketable surplus as well as the functioning of markets themselves. Much research has been concerned with the gendered patterns of agricultural production, tied to aspects such as cropping patterns (Doss 2002; Carr 2008), technology uptake (Doss and Morris 2001; Doss 2001; Peterman, Quisumbing et al. 2010; Quisumbing and Pandolfelli 2010; Bergman Lodin 2012), gender gaps in productivity and access to extension services (Kilic, Palacios-Lopez et al. 2013). With the exception of the global value chain literature (Barrientos, Dolan et al. 2003, Maertens and Swinnen 2009), much less interest has been devoted to the gender dynamics of commercialisation, both in the mainstream developmentalist literature and in feminist post-structuralist work.

Gender-based studies of rural livelihoods, meanwhile, tend to depart from land and labour ***markets***, whether dealt with through the economic perspectives of allocative inefficiencies (Udry, Hoddinott et al. 1995; Udry 1996) or as seen through the structuralist lens of political economy (Razavi 2009), rather than the empirical question of how women and men make a living in rural areas. Given the well-known male bias in land tenure systems in most of Africa, the relative discrimination of women under these tenure systems is by now well documented (Peters 1997; FAO 2010; Peters 2010; FAO 2011; Peters 2013). Less is known, however, of how or even if, such biases also translate into exclusion from agricultural output markets and how this in turn may be connected to women's access to non-farm sources of livelihood.

This paper uses a cross-country comparative perspective in analysing gendered patterns of agricultural commercialisation and rural livelihoods. A first research question addresses whether female farm managers are in fact excluded from agricultural commercialisation (and by implication incomes) when compared to their male counterparts. Whether the sources of this exclusion can be found in the functioning of markets themselves or factors inherent to the household constitute an important sub-question. Secondly, the paper analyses if and how access to non-farm incomes varies by gender and by extension, whether incomes from the non-farm sector can compensate for poorer access to agricultural incomes among female farm managers. Thirdly, how the prospects vary for commercialisation and livelihood diversification among the two different types of female-headed households (***de facto and de jure***) will be considered. Finally, the income-generation patterns of those women who live in male-headed households will be addressed. The analysis in what follows will be guided by these questions, and positioned in relation to existing theoretical and empirical research frontiers and gaps.

2. THEORETICAL POINTS OF DEPARTURE – COMMERCIALISATION, GENDER AND DIVERSIFICATION

As suggested initially, two main tenets underpin pro-poor growth approaches to agricultural development in sub-Saharan Africa: inclusivity and commercialisation. In the grey area literature, prospects for enhancing inclusivity among female farmers are centred on closing the gender gap in agriculture (World Bank, FAO et al. 2009; FAO 2011) through redressing productivity differentials arising from differences in access to productive resources and non-land inputs.

Policy perspectives in turn draw on a vast literature on gendered access to agrarian resources with respect to factor markets especially, both among agricultural economists in what is sometimes referred to as the mainstream feminist literature (Doss and Morris 2001) as well as political economy approaches (Jackson 2003; Razavi 2003; Razavi 2009; Peters 2013). While the latter bring to the fore issues of power, social relations and historical change that are generally absent in the former, both bodies of scholarship demonstrate a dividing line in the command over agrarian resources based at least in part on gender.

More surprising, given the aspirations of pro-poor growth strategies to 'link smallholders to markets' (Bernstein and Oya 2014), is the limited literature available on gendered aspects of commercialisation, especially for food crops – crops that (often mistakenly) are assumed to be 'women's crops' (Doss 2002; Carr 2008). While women's relatively limited commercialisation at one level is strongly connected to the productivity constraints identified in the literature, situating commercialisation in relation to broader livelihood aspects can shed important light on commercialisation dynamics, especially with respect to food crops.

2.1 Agricultural commercialisation and gender

In a recent review of studies of market engagement among African smallholders, Wiggins and Keats (2013) identify a number of explanations for the limited commercialisation among smallholders in general. Ill-fitting technologies and high transportation costs suppress potential marketable surplus or restrict the profitability of trading. High-risk environments characterised by insecure rights of tenure and erratic government policies supress commercialisation; credit constraints and inflated transaction costs provide further explanations. Monopsonistic output markets in some countries lower producer prices, hampering the incentives for selling produce.

Out of these aspects, the ones that have received the most interest in the literature on gender and commercialisation are farm-based constraints related to technology uptake, extension services and insecurity of tenure, tied explicitly or implicitly to lower productivity and the poorer possibilities for the generation of a marketable surplus.

Beyond the supply-side factors connected to poorer female productivity, two main bodies of literature have emerged in relation to women's commercialisation in sub-Saharan Africa. Numerous studies, both contemporary and historical, concern the male dominance over cash crop production and sales as well as the growing male control over women's crops as they become commercialised (Von Braun and Webb 1989; Moore and Vaughan 1994; Lilja, Sanders et al. 1996; Sørensen 1996; Kasente, Lockwood et al. 2002; Negin, Remans et al. 2009; Bergman Lodin 2012).

A second body of literature departs from (global) value chain analysis and concerns gendered aspects of various value chains as well as the gendered outcomes of different types of marketing arrangements, for instance cooperatives or farmers' groups (see Rubin and Manfre 2014 for a recent review) in such value chains. The bias against women in terms of their relatively limited access to productive assets, technology, credit, information and social networks explain their inability to engage in value chains of higher value or contract farming arrangements (Maertens and Swinnen 2009; Schneider and Gugerty 2010). Demands to meet increasingly taxing food safety and quality standards and the inability to fulfil the volume requirements of large-scale buyers raise the entry costs for high-value markets in particular (Reardon, Barrett et al. 2009).

Studies concerned with the gender dynamics of market coordination arrangements that enable access to global value chains are limited. A study from Tanzania suggests that farmers marketing groups dominated by women are less successful in accessing markets than male groups, although the reasons for this as cautioned by the authors may well rest with the lacking access to natural resources (Barham and Chitemi 2009). Fischer and Qaim (2012) show how collective action among Kenyan small-scale banana farmers is tied to increased male dominance over revenues generated from sales, and that female membership of farmers groups can counteract these tendencies. Intra-household aspects can prevent women in male-headed households from joining marketing cooperatives, however, as members need to overcome 'lack of trust and suspicion concerning their whereabouts' and the husbands' fear of 'losing control over them, restricting their engagement in groups' (Gotschi, Njuki et al. 2009: 272), as noted in the context of Mozambique. Finally, Handschuch and Wollni (2013) identify a general empirical gap in relation to the marketing of food crops, while showing the potential of collective action among female farmers of finger millet in Kenya to increase market participation as well as prices.

2.2 Complementarities and commercialisation

While studies of value chains, commercialisation and market participation focus on particular crops, complementary perspectives are concerned with shifts in intra-household relations and production dynamics connected to processes of commercialisation. In this vein, studies of intra-household division of labour show how women withdraw their labour from production of crops whose commercialisation predominantly benefits their husbands, to engage instead in food crop production or non-farm activities (Whitehead and Kabeer 2001). In this context, it can be noted that a common argument for enhancing women's participation in output markets relates to the perceived potential for augmenting independent female incomes that in turn benefit women through increasing their bargaining power within households (Doss 2013; Doss 2014; Rubin and Manfre 2014).

Political economy perspectives contextualise households and intra-household gender dynamics, stressing the joint as well as conflicting activities, interests and responsibilities of wives and husbands over the life cycle (Jackson 1999; Jackson 2007; O'Laughlin 2007; Okali 2012). The necessity of placing the household in broader economic as well as institutional context is highlighted by these perspectives. The contextual nature of both gender relations and production systems also raise the need for geographical contextualisation.

2.3 Rural livelihoods, gender and non-farm, farm interaction

In this respect, studies of diversification (and livelihood perspectives more broadly speaking) offer a valuable contribution to studies of gender and agricultural commercialisation. As noted above, the sources of female exclusion from agricultural livelihood opportunities are manifold and varied, involving limitations in the access to productive assets and less tangible resources as well as restrictions tied to lacking individual mobility and time poverty. Understanding if and how this exclusion interacts with a marginalisation from non-farm activities, or may indeed be compensated for through engagement in non-agricultural pursuits is crucial to analysing gender relations in rural areas and may also shed light on gendered patterns of commercialisation.

Nonetheless, summarising the literature from the 1990s, Whitehead and Kabeer note that 'there is little systematic research on women's non-farm income activities in sub-Saharan Africa, but what data there is testifies to their active involvement' (2001: 13). As suggested by a recent review by Alobo Loison (2015), numerous studies document the segmentation of non-farm activities into low-entry low-return and high-entry high-return activities respectively (Barrett, Bezuneh et al. 2001; Marenya, Oluoch-Kosura et al. 2003; Reardon, Berdegué et al. 2007). Only a limited number of studies analyse the gender dynamics of this segmentation (Canagarajah, Newman et al. 2001; Lay and Mahmoud 2008) and even fewer consider the gendered ways in which farm- and non-farm activities are linked in rural livelihoods (Yaro 2006; Andersson Djurfeldt, Djurfeldt et al. 2013).

3. DATA SOURCES, RELIABILITY AND ANALYSIS

The analysis in this synthesis relies heavily on a quantitative dataset – collected by the Afrint group[2] in eight African countries in 2002 and 2008 (Ethiopia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania, Zambia) and again in six of these countries in 2013/15 – Ghana (2013), Kenya (2013), Malawi (2013), Mozambique (2015), Tanzania (2015) and Zambia (2013). Hence, the data consist of two panel rounds (2002–2008) and (2008 to 2013/15) and three cross sections: 2002, 2008 and 2013. The data used in this paper will cover those countries for which data are available for all of the data collection rounds, i.e. Ghana, Kenya, Malawi, Mozambique, Tanzania and Zambia. This synthesis uses only cross-sectional data. In what follows, the data is referred to as Afrint I (2002), Afrint II (2008) and Afrint III (2013/15), or descriptively as belonging to the first, second or third round of data collection.

In addition, qualitative data is used from three villages in Malawi and Zambia (collected in 2012), and four villages in Ghana (collected in 2011). However, the analysis is predominantly quantitative, with the qualitative data being used mainly to illustrate and explain the tendencies identified in the quantitative data.

3.1 Sampling strategy and research design

The original data were collected with the aim of assessing the possibilities for an Asian-style Green Revolution in the context of sub-Saharan Africa (Djurfeldt, Holmén et al. 2005). With this overarching objective in mind, a multi-stage purposive design was used to select countries and at a second stage regions that were deemed to be above average in terms of agro-ecology and accessibility, but excluding the most vibrant rural economies. Within each country, variability was used as a sampling criterion to select regions, such that each country sample contains regions that are both dynamic and less dynamic. Within each region, villages were again purposively selected and a random sample of the village population was taken. Hence, the sample is representative at the village level. The dataset contains 15 regions and 56 villages (see Table 3.1).

Table 3.1 Data collection regions and type, Afrint III

Country	Region	Region Type	Number of Villages	Sample size Afrint III
Ghana	Eastern	Dynamic	4	249
	Upper East	Less Dynamic	4	289
Kenya	Kakamega	Less Dynamic	5	150
	Nyeri	Dynamic	5	150
Malawi	Ntchisi	Less Dynamic	2	100
	Thiwi Lifidzi	Less Dynamic	2	99
	Bwanje Valley	Dynamic	2	100
	Shire Highlands	Dynamic	2	103
Tanzania	Morogoro	Dynamic	5	202
	Iringa	Less Dynamic	5	193
Zambia	Mkushi	Less Dynamic	4	268
	Mazabuka	Dynamic	5	214
Mozambique	North	Less Dynamic	4	176
	Centre	Dynamic	5	169
	South	Less Dynamic	2	82

A balanced panel design has been used to take into consideration attrition as well as changes in the village populations between the rounds of data collection, hence maintaining representativity between the rounds of data collection. A balanced panel design entails keeping the size and representativity of the cross sections intact by sampling households to make up for attrition between the rounds of data collection. In addition, substantial changes in the village populations between the rounds of data collection in terms of in-migration are addressed through additional sampling of in-migrants specifically. Hence, the dataset contains three groups of respondents: (1) panel households sampled either in two (panel I or panel II) or all three rounds of data collection (Afrint I, Afrint II and Afrint III); (2) households sampled to make up for attrition (sampled in Afrint II or Afrint III); and (3) migrant households that have been added to take into consideration changes in the composition of the village population, either for the second or third round of data collection.

The ambitions as well as the quality of the data have evolved over the project cycles: the Afrint I data focused on production and technology related to the major grain crops (rice, maize, sorghum, teff) and cassava, whereas the Afrint II survey added a more detailed section on commercialisation and also collected cash income data for the first time. For the final round of data collection, cash income data were individualised, with data being collected separately for all adult household members.

3.2 What the data can and cannot tell us

While the Afrint dataset is unique in the sense that it captures changes in rural livelihoods over time, several caveats need to be borne in mind: firstly, it is representative at the village level and as such is not nationally representative of smallholders in the country as a whole. Conclusions therefore cannot be drawn about general improvements in food security, for instance. Secondly, the dataset has not aimed to collect the detailed type of production data found in agricultural surveys collected by Michigan State University for instance, nor does it provide the detail commonly found in consumption surveys (such as the Demographic Health Surveys). Rather, the dataset provides a set of broad indicators capturing changes in food security status, nutritional diversity and commercialisation.

Another drawback relates to the use of the household as the sampling unit, which is problematic for several reasons related both to assumptions of theory (and the associated presumption of a joint utility function) and methodology (assuming that the household head has

perfect information and as such can speak on behalf of the household).

3.3 Who are the female-headed households?

The self-identified farm manager was interviewed during the survey. For the first round of data collection, the presumption was made that this was the same person as the household head. For the two subsequent rounds, this presumption was shown to be wrong. In the analysis below, the sex of the *farm manager* is used to classify households as female headed. The aspiration is to capture as broad a category of female household headship as possible. However, this objective runs the risk of merging households with quite different characteristics into a single category.

For Afrint III, 734 farms (29 percent) were managed by women. Of these, 124 (17 percent) had a male household head, and they were therefore *de facto* rather than *de jure* female-headed households, i.e. there was a male household head residing elsewhere. The use of the sex of the farm manager to classify households by gender in this sense combines households that are likely to be differently positioned with respect to the agrarian economy. For instance, their access to non-farm incomes as well as male labour may be quite different. Asset data show few differences between the two household types, however, with two major exceptions. Land size is slightly larger among the de facto female-headed households for Afrint III: 1.7 hectares compared with 1.4 hectares for the *de jure* female-headed households (sig. at the 5 percent level) and access to male labour is much higher among these households. With respect to the latter variable, the *de facto* female-headed households replicate the male-headed households rather than the *de jure* female-headed households, with half the adult labour being male in the de facto female-headed households compared with 38 percent for the *de jure* female-headed households (sig. at the 1 percent level).

Taking a closer look at the *de facto* female-headed households suggests that they are strongly concentrated to particular regions and countries with longstanding migrant labour histories. *De facto* female-headed households account for a substantial share of total female-headed households in the Centre region (54 percent) in Mozambique, Nyeri (30 percent) and Kakamega (38 percent), both in Kenya. Together these three regions account for two thirds of the de facto female-headed households. While the differences between household types must be borne in mind, in general the *de facto* female-headed households contribute a very minor share of the female-headed households outside these regions. At the national and regional levels, the sample sizes are too small to statistically test the differences between *de facto* and *de jure* female-headed households, but Section 6 is devoted to discussing differences between the two household types using the full sample. In what follows, the terms farm manager, landholder and household head are used interchangeably in the text to denote the self-identified farm manager.

3.4 Data on commercialisation and livelihoods

Variables are used that concern three aspects of rural livelihoods in particular: commercialisation, cash incomes and cash income composition. For maize – the only grain staple that is grown across the five countries – commercialisation is measured through market participation, share of produce sold and volume sold for 2002, 2008 and 2013, by sex of farm manager. For other food crops, data are only available for market participation and for cash crops only data on whether the crop was grown (with the presumption that cash crops are always sold). Production and commercialisation data for particular crops are only available at the farm level.

For cash income composition, however, two sources of data are available for the Afrint III data: firstly, the farm manager was asked to estimate the size of cash income for the household as a whole and secondly individual cash income data, by source, were collected for all adult household members by sex within each household. Although the lack of individual data for Afrint II prevents outright comparison, differences in size and composition of cash income by sex of farm manager can be traced over time, while gender patterns of intra-household sources of livelihoods can be described for the final round of data collection at least.

The drawbacks of relying on cash income data to analyse livelihoods in contexts where subsistence production is widespread must be acknowledged. Nonetheless, the varied nature of production systems across regions and countries and the lack of detailed production data for roots and tubers prevent the calculation of total household income. While cash income analysis is partial, it is also neutral in the sense that it does not disregard the contribution of non-grain crops to household welfare. Further admonitions related to the limitations of cash income data as reflective of intra-household gender relations are also necessary: while intra-household income data can say something about how women and men make their living, they

say nothing about differences in consumption and expenditure based on sex. Moreover, even if gender-based differences in cash income (whether within or among households) may reflect structural discrimination of women in processes of commercialisation, to what extent such differences translate into differences in household welfare is not possible to assess by using income data alone.

Statistically the analysis is descriptive: data on commercialisation and incomes are compared by sex of farm manager, with differences of means between the two groups tested through ANOVAs. Given the risk of type 1 errors connected to the high number of statistical tests carried out, differences that are statistically significant above the 1 percent level need to be interpreted very cautiously.

3.5 Qualitative data collection

Qualitative fieldwork was carried out in November of 2012 in three villages in Malawi (in Dedza and Ntchisi Districts) and three villages in Zambia (in Mkushi and Mazabuka Districts). In the case of the Malawian villages, both spouses in nuclear households were interviewed as well as women heading their own households. A method was used that had been tested in four villages in Ghana in 2011 (Andersson Djurfeldt, Djurfeldt et al. 2014).

For the Malawian villages, respondents were selected through stratifying households that had been surveyed as part of Afrint II by cash income per adult equivalent in each village. The households were divided into three groups on this basis: below average, average and above average. In each village, the intention was to select three households randomly within each category, with a total sample of nine nuclear households (covering a total of 18 respondents per village). Unfortunately, due to a misunderstanding among the research assistants, there was a slight oversampling of the above-average income bracket in one of the villages, while only the male spouse was interviewed in two households.

The ambition was to also collect data from three households headed by single women in each income segment. Since these households were generally clustered in the below-average income category, and in addition many women had remarried since Afrint II, or were not possible to trace, a supplementary sample of women heading their own households was taken. A total of 80 interviews with individual farmers were carried out by trained research assistants, who were mostly masters-level students. Individual interviews at the household level were complemented with ***key informant interviews*** with the village heads (or in some cases the sub-village heads), members of the water association, lead farmers, members of credit groups and cooperatives. In addition, staff at the Ministry of Agriculture and Food Security at the Dedza District Agricultural Office, as well as the local extension agent, were interviewed.

To triangulate further, focus group discussions were carried out with two gender-separated groups, stratified by age. The respondents in the focus groups were not part of the individual interviews. The key informant interviews and the focus group discussions were carried out by four senior researchers.

In the case of the three Zambian villages, the qualitative data collection at the level of the household was not carried out. Here only key informant interviews and focus group discussions were undertaken. The qualitative data from village and district levels are summarised in Table 3.2.

Table 3.2 Qualitative data at district and village levels from Malawi and Zambia

Malawi
Dedza District November 20-21, 2012
District Agriculture Development Officer (DADO), Dedza District
Extension Methodologies Officer, Dedza District
Methodologies and Gender Officer, Dedza District
Crops Officer, Dedza District
District Irrigation Officer, Dedza District
Ntchisi District Novermber 27, 2012
Research and Business Manager, National Smallholders Farmer's Association of Malawi
World Vision, Assessment Design Monitoring and Evaluation Co-ordinator
Interviews pertaining to the villages
Mzandu, November 25-27, 2012
Headman
Logger
Agricultural Extension Development Officer (AEDO), Ntchisi District, responsible for Malomo, EPA, (interviewed in Dedza)
Sawa groundnut scheme members
Borehole committee
Female focus group
Male focus group
Cholamakanda, November 23-25, 2012
Senior adviser to village headwoman
Headman
Borehole
Borehole Committee/irrigation scheme/lead farmers
Female focus group
Male focus group
Local trader
ROSCA
Lingaka, November 19-21, 2012
Headwoman, Lingaka
Lead Farmer, male
Female Focus group
Male focus group
Borehole committee
Credit group
Agricultural development coordinator, Linthipe EPA (interviewed in Ntchisi)
Agricultural Extension Development Officer (AEDO), responsible for Lingaka (interviewed in Ntchisi)

Zambia
Niikantaka October 13-16, 2012
Chief Naluwama
Community leaders: headman and zone secretary, five headmen out of seven interviewed
Representatives Manyonyo Water Users Association
Women's clubs, representatives from four clubs
Extension officer
Contract farming agents (cotton)
Settlement committee members, Manyonyo, settlement scheme
Women's micro-credit savings group
NGOs (two NGOs present)
Co-operatives: representatives from 9 co-operatives
Women's focus group discussion
Men's focus group discussion
Informal interviews with market traders
Chilekwa, October 18-21, 2012
Senior Chief Chilekwa
Women's Clubs (representatives of 15 clubs)
Representatives of co-operatives (9 co-operatives)
Extension agent
Community leaders: headmen and settlement scheme representatives
NGOs (two within agriculture)
Lead Farmers with dunavant
Water users association (domestic water, not for agriculture)
Women's focus group discussion
Men's focus group discussion
Grain trader
Chilekwa headmaster and Deputy headmaster, chilekwa Basic school
Mkwezi, October 23-25, 2012
Community leaders (village headmen)
Womean's clubs (representatives of 9 clubs)
Co-operatives (representatives of 11 co-operatives)
Extension officer
Headmaster of Mkwezi School
NGOs (DAPP)
FAO contract farmers
Pump mender
Women's focus group discussion
Men's focus group discussion

4. AGRICULTURAL COMMERCIALISATION AND GENDER

Patterns of commercialisation for maize, non-grain food crops and cash crops are analysed below. While the dataset also contains information on rice and sorghum, maize is the only grain crop that is grown across the countries, although its national and regional importance varies greatly.

4.1 Maize

Even at the national level and for one particular crop (in this case maize) it is difficult to draw any clear-cut conclusions with respect to commercialisation or gendered patterns of the same.

4.1.1 Commercialisation tendencies

Whereas food crops such as maize are frequently described as 'women's crops' (Sachs 1996; Arndt and Tarp 2000), commercialisation in terms of market participation in maize is widespread among both male-managed farms (MMFs) and female-managed farms (FMFs) especially in Tanzania and Zambia. While market participation was biased towards MMFs in Ghana and Tanzania at the time of Afrint I, this bias disappeared by the second survey with market participation for maize generally falling for both MMFs and FMFs in Ghana since the start of the project. In the case of Malawi, market participation has increased for male farm managers, but decreased for their female counterparts since Afrint II.

By contrast, commercialisation by all measures has increased for both MMFs and FMFs in Zambia especially during the second period, while marketed volumes were higher in Ghana for both farm types compared to Afrint II (see Table 4.1).

Table 4.1 Commercialisation in maize, Afrint I to III, by country and sex of farm manager

		Afrint I						Afrint II						Afrint III					
		MMF	N	FMF	N	Diff	Sig.	MMF	N	FMF	N	Diff	Sig.	MMF	N	FMF	N	Diff	Sig.
Ghana	Market participation	0.97	156	0.87	46	0.10	**	0.67	296	0.74	73			0.58	337	0.54	81		
	Share sold of production	0.61	150	0.59	40			0.65	199	0.68	54			0.57	197	0.54	44		
	Sale of maize. Kg	481	142	337	39	143	**	516	190	380	54	137	**	655	187	420	44	234	***
Kenya	Market participation	0.21	171	0.16	128			0.31	196	0.33	104			0.34	193	0.34	107		
	Share sold of production	0.39	36	0.34	20			0.51	60	0.46	34			0.44	65	0.38	36		
	Sale of maize. Kg	513	34	513	20			588	57	315	33	273	**	687	63	440	35		
Malawi	Market participation	0.07	239	0.03	160			0.39	224	0.33	171			0.41	275	0.27	125	0.14	****
	Share sold of production	0.17	16	0.09	5			0.25	85	0.20	56			0.22	113	0.24	34		
	Sale of maize. Kg	167	14	81	5			300	79	206	55	94	*	267	103	220	33		

Tanzania	Market participation	0.55	286	0.34	70	0.21	***	0.48	294	0.47	64			0.57	275	0.59	82		
	Share sold of production	0.41	155	0.35	24			0.46	128	0.43	29			0.43	156	0.50	47	-0.07	*
	Sale of maize. Kg	570	150	384	23			711	121	489	29			892	152	695	46		
Zambia	Market participation	0.24	270	0.25	92			0.61	354	0.46	89	0.15	**	0.79	366	0.59	108	0.20	***
	Share sold of production	0.35	65	0.33	23			0.49	215	0.41	41	0.08	**	0.56	290	0.46	64	0.10	***
	Sale of maize. Kg	524	59	324	23	200	*	1880	202	1079	41	801	**	2926	275	1175	63	1750	***
Mozambique	Market participation	0.36	197	0.27	145	0.09	*	0.33	231	0.17	113	0.16	***	0.26	229	0.27	174		
	Share sold of production	0.42	70	0.40	39			0.36	77	0.20	19	0.15	***	0.30	57	0.22	46	0.08	*
	Sale of maize. Kg	218	67	198	39			269	75	136	19		*	226	51	197	45		

Notes: Market participation: share of producing households stating that they sold maize.Share sold of production: share of total production sold.Sale of maize, kg: total amount of maize sold.Extreme cases for amounts of maize sold have been removed at the village level

Maize commercialisation in Zambia was disproportionately favouring MMFs already by the second survey, with 61 percent of maize-growing households in this category participating in the market compared to 46 percent of FMFs. This gap in market participation had expanded further by the time of Afrint III, although both FMFs and MMFs were increasingly selling maize. Whereas the gap in share marketed was largely similar for the second and third phases, again the share marketed had increased for both household types by the time of Afrint III, with MMFs marketing 56 percent of their production, compared with 46 percent for FMFs. The disparity in amounts sold was also much larger by this time, suggesting that the sources of increased differences in commercialisation can be traced to differences in marketable surplus, related to production factors rather than market segmentation or differences in marketing behaviour as such.

Qualitative fieldwork carried out in Zambia and Malawi confirms this notion. In the case of two of the Zambian study sites (Chilekwa and Nikantaka) visited in 2012, the introduction of conservation farming in 2010/11 as well as the re-introduction of fertiliser subsidies were perceived to be sources of increased production and yields as expressed in individual as well as group interviews. Conservation farming was being promoted by a non-governmental organisation (NGO), the Conservation Farming Unit (CFU), in collaboration with the Ministry of Agriculture. While representatives from the CFU in the two sites suggested that female farmers were more actively embracing conservation farming, the labour intensity of conservation farming adds to the workload of women. The latter was identified by female focus groups as the major constraint to production on female-managed farms. The ability to make full use of conservation farming techniques is therefore likely to be limited by labour shortages for female-managed farms especially (Andersson Djurfeldt and Hillbom 2016). The shortage of labour on FMFs was also identified as the distinguishing feature of female farm managers in the focus group discussions across the three Malawian villages where fieldwork was carried out in 2012. The individual interviews with women who were heading their own households also attributed the loss of male labour as a result of divorce, separation or widowhood to a gradual loss of productivity, as soil fertility was not possible to maintain over time.

4.1.2 Markets and prices

Maize markets are generally not physically segmented by gender – maize was sold exclusively within the village by both male and female farm managers in all countries, except for Zambia. In Zambia by contrast, 47 percent of the male farm managers sold maize within the village only, compared to 70 percent of the female farm managers (a difference that is statistically significant at the 1 percent level). Most farmers (79 percent) in the Zambian sample rely on the state marketing

board as their main marketing channel, however, with no statistically significant differences between MMFs and FMFs, suggesting that market accessibility is not differentiated by sex, even if the location of sales differs.

Further support for the interpretation that constraints to women's commercialisation in maize can be found mainly in relation to factors endogenous to the households, rather than in the discrimination of women in output markets, is provided by price data on average maize prices received. Table 4.2 shows that in general prices were the same for both male and female farm managers, with two exceptions – in Ghana for the second round of data collection, the average price received by the latter was actually higher than the former, while the reverse was the case in Malawi. By the time of Afrint III these differences had disappeared, however.

Table 4.2 Mean price of maize per 100 kilograms received by sex of head of household, Afrint II and Afrint III, in 2010 (PPP adjusted USD)

	2008						2013			
	MMF	N	FMF	N	Diff	Sig.	MMF	N	FMF	N
Ghana	65	195	71	52	-6	*	66	195	66	44
Kenya	57	58	52	33			58	62	55	34
Malawi	39	75	36	42	3	*	22	107	22	31
Tanzania	47	132	48	26			28	153	28	47
Zambia	40	173	38	27			36	277	35	61
Mozambique	32	77	28	19			40	49	39	37

Notes: Extreme cases have been removed by region.The number of cases differ slightly from those reported in Table 3.2: this is related to the removal of extreme cases as well as missing price data for Zambia and Mozambique.

Even if price discrimination does not appear to be forthcoming, qualitative data from the three villages in Malawi illustrate the limitations to women's mobility when compared with men. Here intra-household interview data, with both spouses as well as group interviews with women, show how female mobility is restricted by domestic chores, especially related to caring for young children and family members suffering from ill health. While the data underscore the need for contextualisation and point to some similarities in commercialisation patterns between MMFs and FMFs, they also indicate gendered differences in the ability to participate in markets, related primarily to labour constraints and the lack of marketable surplus.

4.2 Non-grain food crops

The gender dynamics of both production and commercialisation change over time and are also to some extent country specific as suggested by the data on non-grain food crops. A few trends are suggested by the data in Table 4.3: firstly, at a general level, despite the large number of crops covered, there are few strongly significant differences in market participation based on the sex of the farm manager and secondly, patterns shift over time. For Ghana, a movement into markets for plantains and out for groundnuts can be noted since the first survey, with no statistically significant differences in market participation between the farm types. In Kenya, Irish potatoes have become increasingly commercialised during the same period, again without any gendered biases in production or market participation. For sweet potatoes and millet, moreover, market participation is skewed towards FMFs, with male market participation declining and female market participation increasing for these crops since Afrint I. In turn, this suggests a feminisation of these particular markets over time, despite an earlier male bias.

In Malawi, male farm managers have increased their participation in the sweet potato market relative to female farm managers. Meanwhile, market participation in cassava has increased disproportionately among MMFs, while both female and male farm managers have withdrawn from vegetable markets. Although the production of vegetables has increased among both MMFs and FMFs since Afrint II, market participation has declined (significant at the 1 percent level) and a male-biased gender gap in market participation has emerged in the process. In Tanzania, a gender-based difference in the market for beans has re-emerged since the first phase of the project, with MMFs having significantly higher market participation than FMFs by the concluding survey. Meanwhile, the female biases in three crops – peas, yams and other food crops – have disappeared. There seems to be some signs of the displacement of female farm managers in these markets, as market participation of male farm managers has increased at

the same time. In Zambia, despite the large gender-based differences in the commercialisation of maize, there were no statistically significant differences in market participation for any of the food crops in any of the years. The largest number of gender gaps in market participation is found in Mozambique, but this contrasts strongly with the situation during Afrint II when there were no gender-based differences in market participation.

Table 4.3 Market participation for other food crops by sex of farm worker (share of growers participating in particular markets)

		Afrint I						Afrint II						Afrint III					
	Crop	MMF	N	FMF	N	Diff.	Sig.	MMF	N	FMF	N	Diff.	Sig.	MMF	N	FMF	N	Diff.	Sig.
Ghana	Cassava	0.95	157	0.85	46	0.10	**	0.90	206	0.92	61			0.88	199	0.83	54		
	Plantains	0.47	47	0.67	12			0.79	154	0.73	40			0.87	158	0.88	43		
	Beans	0.39	188	0.42	24			0.28	226	0.40	35			0.31	218	0.40	48		
	Peas	0.20	10	0.50	2			0.07	15	0.00	3			0.21	24	0.29	7		
	Irish Potatoes	0.50	2					0.00	4					0.00	2	0.00	1		
	Sweet Potatoes	0.40	105	0.56	9			0.25	72	0.00	3			0.29	73	0.17	6		
	Millet	0.26	172	0.20	20			0.06	142	0.05	22			0.10	228	0.06	54		
	Groundnuts	0.62	217	0.54	28			0.45	209	0.42	31			0.31	232	0.33	48		
	Yams							0.60	129	0.45	29			0.58	120	0.48	31		
	Cocoyams							0.80	165	0.87	38			0.80	153	0.79	38		
	Arrowroot																		
	Vegetable	0.62	236	0.64	45			0.76	268	0.78	60			0.62	288	0.50	70	0.12	*
	Fruits							0.59	37	0.67	3			0.81	47	0.67	9		
	Other	0.56	102	0.78	18	-0.22	*	0.53	17	0.60	5					0.00	1		
Kenya	Cassava	0.25	4	0.50	2			0.05	65	0.09	35			0.20	83	0.31	51		
	Plantains	0.31	133	0.24	99			0.29	173	0.27	89			0.31	159	0.40	89		
	Beans	0.28	165	0.29	123			0.15	180	0.14	92			0.37	191	0.39	104		
	Peas	0.48	61	0.34	50			0.18	51	0.18	28			0.53	68	0.48	25		
	Irish Potatoes	0.43	88	0.54	81			0.36	96	0.39	54			0.58	113	0.58	50		
	Sweet Potatoes	0.35	124	0.26	94			0.26	140	0.29	63			0.26	149	0.39	79	-0.13	**
	Millet	0.29	17	0.23	13			0.15	26	0.29	14			0.22	32	0.48	21	-0.26	*
	Groundnuts	0.25	40	0.17	23			0.12	42	0.15	26			0.22	32	0.16	19		
	Yams							0.14	37	0.19	16			0.19	26	0.14	14		
	Cocoyams							0.13	8	0.00	1								
	Arrowroot													0.04	69	0.20	30		
	Vegetable	0.69	162	0.60	111			0.76	157	0.64	69	0.12	*	0.56	176	0.58	93		
	Fruits							0.34	74	0.34	32			0.37	153	0.38	81		
	Other	0.25	50	0.16	45			0.28	25	0.20	15			0.20	5	0.33	3		
Malawi	Cassava	0.25	56	0.25	44			0.35	69	0.28	60			0.45	75	0.18	39		
	Plantains	0.32	88	0.41	59			0.65	46	0.44	48			0.50	105	0.49	41		
	Beans	0.33	139	0.28	94			0.43	134	0.55	110			0.64	151	0.55	74		
	Peas	0.22	63	0.26	43			0.38	37	0.51	55			0.40	100	0.27	48		
	Irish Potatoes	0.21	51	0.32	19	0.25	*	0.72	50	0.52	23			0.80	56	0.79	19		
	Sweet Potatoes	0.57	151	0.12	88			0.41	91	0.32	73			0.52	158	0.28	61	0.24	***
	Millet	0.19	26	0.06	18			0.28	29	0.20	20			0.50	36	0.52	25		
	Groundnuts	0.28	97	0.15	54	0.13	*	0.64	92	0.60	45			0.73	138	0.59	54		

	Yams							0.00	1	0.00	1			0.00	6	0.00	1		
	Cocoyams							0.00	1	0.00	1			0.00	1				
	Arrowroot													0.00	2	0.00	3		
	Vegetable	0.31	155	0.21	96	0.10	*	0.68	79	0.62	63			0.45	182	0.28	82	0.17	**
	Fruits							0.33	9	0.50	8			0.31	71	0.31	32		
	Other	0.22	23	0.10	10			0.61	128	0.56	91			0.84	56	0.79	14		
Tanzania	Cassava	0.50	68	0.30	10			0.37	35	0.38	8			0.28	102	0.15	20		
	Plantains	0.41	169	0.19	37	0.22	**	0.48	83	0.25	12			0.35	141	0.27	30		
	Beans	0.48	143	0.16	45	0.32	***	0.58	93	0.50	20			0.52	129	0.26	42	0.26	***
	Peas	0.34	145	0.33	30			0.39	57	0.83	6	-0.44	*	0.58	62	0.61	18		
	Irish Potatoes	0.53	89	0.32	28	0.21	*	0.69	61	0.55	20			0.59	87	0.57	35		
	Sweet Potatoes	0.28	197	0.24	51			0.38	55	0.31	13			0.32	131	0.23	43		
	Millet	0.44	63	0.36	14			0.31	16	0.33	6			0.00	1				
	Groundnuts	0.37	68	0.58	12			0.47	32	0.00	3			0.45	47	0.36	11		
	Yams							0.14	7	1.00	1			0.17	12	0.40	5		
	Cocoyams							0.10	10	0.00	1			0.32	28	0.17	6		
	Arrowroot													0.00	3				
	Vegetable	0.37	219	0.29	58			0.68	85	0.59	17			0.46	184	0.49	55		
	Fruits							0.58	33	1.00	1			0.42	118	0.17	23	0.25	**
	Other	0.49	43	0.67	6			0.59	41	0.89	9	-0.30	*	0.62	56	0.60	20		
Zambia	Cassava	0.19	83	0.22	59			0.26	94	0.30	20			0.41	122	0.38	40		
	Plantains	0.40	47	0.75	4			0.54	41	0.50	4			0.45	109	0.29	24		
	Beans	0.30	115	0.17	41			0.38	117	0.33	24			0.44	142	0.36	44		
	Peas	0.67	3	0.25	4			0.46	13	0.75	4			0.00	7	0.00	5		
	Irish Potatoes	0.50	10	0.00	2			0.48	21	0.50	4			0.65	20	0.67	3		
	Sweet Potatoes	0.55	244	0.49	89			0.66	238	0.71	52			0.63	291	0.53	83		
	Millet	0.22	87	0.30	54			0.50	44	0.50	14			0.50	24	0.41	17		
	Groundnuts	0.41	209	0.31	80			0.53	246	0.60	55			0.63	304	0.53	83		
	Yams							0.00	3	0.00	2			0.50	2				
	Cocoyams									0.00	1			1.00	1				
	Arrowroot													0.00	1				
	Vegetable	0.74	163	0.66	47			0.87	134	0.88	25			0.73	231	0.73	49		
	Fruits							0.67	12	0.00	1			0.29	72	0.22	23		
	Other	0.74	47	0.58	12			0.33	78	0.31	13			0.65	85	0.59	17		
Mozambique	Cassava	0.32	180	0.23	126			0.27	201	0.30	50			0.44	176	0.31	88	0.13	**
	Plantains	0.42	64	0.40	29			0.46	57	0.36	11			0.47	102	0.44	36		
	Beans	0.24	127	0.18	104			0.11	164	0.08	72			0.42	166	0.24	118	0.18	***
	Peas	0.17	53	0.04	25	0.13	*	0.11	94	0.17	18			0.56	96	0.43	23		
	Irish Potatoes	1.00	1	0.00	3			0.00	0	0.00	0			0.19	16	0.07	14		
	Sweet Potatoes	0.12	85	0.10	68			0.17	52	0.25	16			0.37	134	0.17	100	0.20	***
	Millet	0.00	8	0.00	4			0.20	20	0.00	5			0.11	18	0.00	1		
	Groundnuts	0.54	134	0.30	94	0.24	***	0.54	136	0.43	30			0.56	165	0.24	95	0.32	***
	Yams							0.50	2	0.00	1			0.33	15	0.07	15	0.26	*
	Cocoyams							0.00		0.00	0			0.00	1	0.00	1		
	Arrowroot													0.29	7	0.00	3		

	Vegetable	0.13	85	0.11	66			0.42	24	0.13	8			0.41	49	0.18	51	0.23	**
	Fruits							0.83	6	0.80	5			0.40	50	0.33	18		
	Other	0.03	38	0.07	28			0.14	22	0.08	12			0.06	212	0.11	135		

Notes: Data on yams, cocoyams and fruits were added to the survey in 2008, and arrowroot in 2013.

In terms of marketing arrangements, participation in contract farming for other food crops has been very limited throughout the period from Afrint I onwards, both for male- and female-managed farms. Only in Ghana, in the final survey round, was the share of male farm managers participating in contract farming (4 percent) higher than for their female counterparts, among whom none were engaged in contract farming (sig. at the 5 percent level).

What the data shows is the need to address commercialisation as a fluid process – farmers move in and out of markets, as opportunities change often in gender-neutral ways. Although the data do not detail amounts sold, the limited evidence of male domination of markets as food crops are being increasingly commercialised (as seen in Tanzania) is counterbalanced by tendencies of increasing female biases in market participation in Kenya. However, some country-level dynamics can be noted: Ghana and Zambia have few gender gaps in market participation for any of the non-grain food crops, while Mozambique and to some extent Malawi exhibit a growing masculinisation of market participation for numerous crops. Moreover, in the latter cases this adds to male biases in maize commercialisation found in these countries.

4.3 Non-food cash crops

With respect to cash crops, again the patterns of production differ from country to country: although relatively few cash crops are grown in each country, the type of crop and the gendered patterns of commercialisation vary. Despite such variation, the limited production of cash crops across the countries is quite striking and connected in large part to the regional nature of particular production systems. In Ghana, only half the sampled villages are found in the cocoa-producing regions for instance, explaining the low country-level involvement in cocoa production, despite its regional importance. With the possible exception of Kenya, where sugar cane and coffee are grown by around a quarter and a third of the sampled farmers respectively, cash crop production hence is generally limited.

Despite the common perception in the literature (Hill and Vigneri 2014) that traditional cash crops tend to be dominated by male farmers, Table 4.4 suggests that there are only three examples of cash crops whose production over the period is predominantly engaged in by male farm managers: sugar cane in Mozambique and Malawi, tobacco in Malawi and cotton in Zambia. In the case of tobacco in Malawi, this dominance is explained by membership rules in the tobacco marketing association that discriminate against women, while travel to centralised auction floors is impossible for many women whose mobility is restricted by domestic responsibilities and gender norms concerning travel.

Cotton production in Zambia is contract-based. Representatives of the two contracting companies, Dunavant and Alliance Cotton, as well as two lead farmers engaged in recruiting farmers by Dunavant in Nikantaka village identified labour constraints, rather than marketing arrangements, as the major production constraints for women. Both contract schemes reported an increase in women growing cotton although formal registration with the schemes may be carried out through adult sons, for instance. When the qualitative interviews were carried out in late 2012, of the ten lead farmers recruited by Dunavant in Chilekwa village to encourage cotton contracting, three were women. The quantitative data confirms widespread involvement in contract farming for cash crops in Zambia: for Afrint III, 82 percent of the sampled farmers grew cash crops on contract basis, with no statistically significant differences based on the sex of farm manager. The major discrepancy between the two types of farms lies instead in production: whereas 118 MMFs were involved in cash crop production, only 12 FMFs were growing cash crops.

Table 4.4 Share of households producing cash crops, by country and sex of head of household 2002 to 2013

		Afrint I						Afrint II						Afrint III					
		MMF	N	FMF	N	Diff.	Sig.	MMF	N	FMF	N	Diff.	Sig.	MMF	N	FMF	N	Diff.	Sig.
Ghana	Cotton	0.01	342	0.00	69						111						113		
	Sugar Cane	0.01	342	0.00	69						111						113		
	Cashew Nuts	0.01	342	0.00	69			0.00	457	0.01	111						113		
	Cocoa	0.04	342	0.06	69			0.10	456	0.08	111			0.14	425	0.08	113		
	Tobacco	0.06	342	0.01	69			0.02	457	0.02	111			0.01	425	0.00	113		
	Coffee	0.02	342	0.00	69			0.01	457	0.01	111			0.00	425	0.00	113		
	Oil Palm													0.11	425	0.03	113		
	Other	0.05	316	0.03	64			0.01	457	0.01	111						113		
Kenya	Sugar cane	0.24	169	0.20	128			0.22	196	0.18	103			0.32	193	0.22	107		
	Tobacco	0.01	169	0.00	128												107		
	Coffee	0.20	169	0.25	128			0.18	196	0.21	103			0.19	193	0.22	107		
	Tea	0.12	170	0.13	128			0.12	196	0.16	103			0.13	193	0.09	107		
	Sisal	0.01	169	0.00	128												107		
	Pyrethrum	0.01	169	0.01	128												107		
	Fruits and vegetables, export							0.11	196	0.07	103								
	Flowers							0.02	196	0.02	103			0.02	193	0.01	107		
	Spices							0.00	196	0.00	103			0.01	193	0.03	107		
	Other	0.08	167	0.05	128			0.02	194	0.01	102						107		
Malawi	Cotton	0.01	235	0.00	159			0.04	222	0.03	170			0.09	276	0.04	126	0.05	*
	Sugar Cane	0.18	235	0.10	159	0.08	**	0.08	224	0.02	169	0.06	**	0.15	276	0.06	126	0.09	***
	Cocoa	0.02	235	0.03	159												126		
	Tobacco	0.17	235	0.09	159	0.08	**	0.15	224	0.02	170	0.13	***	0.14	276	0.02	126	0.12	***
	coffee							0.00	224	0.01	170						126		
	Sisal							0.00	224	0.01	170			0.02	276	0.02	126		
	Pyrethrum	0.31	235	0.15	159	0.16	***										126		
	Other	0.00	233	0.01	157												126		
Tanzania	Cotton	0.01	174	0.00	43			0.00	318	0.01	74	-0.01	**	0.00	300	0.00	126		
	Sugar Cane	0.07	174	0.00	43	0.07	*	0.05	318	0.00	74	0.05	**	0.08	300	0.08	95		
	Cashew Nuts	0.01	174	0.00	43						74			0.12	300	0.05	95		
	Cocoa	0.04	174	0.00	43			0.02	318	0.00	74			0.11	300	0.03	95	0.07	*
	Coffee	0.09	174	0.00	43	0.09	**				74			0.00	300	0.00	95	0.08	**
	Tea	0.01	174	0.02	43						74			0.01	300	0.00	95		
	Pyrethrum	0.03	174	0.02	43									0.01	300	0.02	95		
	Fruits and vegetables, export							0.01	319	0.00	74								
	Oil Palm										74			0.13	300	0.06	95	0.07	*
	Flowers										74			0.01	300	0.00	95		
	Spices										74			0.02	300	0.00	95		
	Other	0.45	174	0.37	43			0.11	320	0.11	74			0.19	300	0.08	95	0.11	**
Zambia	Cotton	0.35	300	0.16	102	0.19	***	0.23	326	0.11	76	0.12	**	0.30	366	0.11	110	0.19	***
	Sugar Cane	0.01	299	0.00	102			0.01	325	0.00	76			0.04	366	0.00	110	0.04	**
	Cashew Nuts							0.01	326	0.00	76						110		
	Tobacco	0.00	299	0.01	102	-0.01	*				76						110		
	Other	0.11	299	0.01	102	0.10	***	0.12	326	0.09	76			0.01	366	0.00	110		

Mozambique	Cotton	0.02	227	0.00	170	0.02	*				121			0.02	242	0.00	183	0.02	*
	Sugar Cane	0.14	227	0.06	170	0.08	***	0.11	281	0.02	121	0.09	***	0.25	242	0.13	183	0.12	***
	Cashew Nuts	0.25	227	0.19	170			0.20	281	0.05	121	0.15	***	0.31	242	0.13	183	0.18	***
	Coccoa	0.01	227	0.02	170									0.01	242	0.01	183		
	Tobacco	0.03	227	0.01	170	0.02*		0.01	281	0.00	121			0.02	242	0.00	183	0.02	**
	Tea													0.01	242	0.03	183	-0.02	*
	Pyrethrum													0.00	242	0.01	183		
	Fruits and vegetables, export							0.01	281	0.00	121								
	Oil Palm													0.06	242	0.03	183		
	Spices							0.00	281	0.01	121						183		
	Other	0.01	227	0.01	170			0.06	281	0.02	121	0.04	**	0.05	242	0.03	183		

Notes: For Afrint I, as many households were coded as 'do not know' for cash crop production, it was assumed that these questions had been skipped rather than answered negatively, and these answers were recoded as zero. Fruits and vegetables for export were added for Afrint II and removed for Afrint III. Flowers, spices and sisal were added for Afrint II. Oil palm was added for Afrint III.

While long-term trends are visible only for three particular crops, at the country level the number of gender gaps in cash crop production are highest for Malawi and Mozambique, aggravating the biases found against female-managed farms with respect to maize commercialisation as well as non-grain food crops in these countries. In the case of Zambia, gender biases in maize commercialisation combine with poorer marketing possibilities for female farm managers with respect to cotton. To the extent that sources of gender gaps in commercialisation can be identified, the constraints to maize marketing lies in the inability of female farm managers to produce a marketable surplus that competes with the volumes sold by male respondents, while male biases in cash crops appear to be connected to gender-segmented markets in the case of tobacco and to labour related production constraints in the case of cotton. For Ghana and Kenya, again, few gender-based biases exist with respect to cash crop production, while for Tanzania the period between Afrint II and Afrint III has seen the emergence of a growing number of gaps between MMFs and FFMs.

5. CASH INCOMES, GENDER AND DIVERSIFICATION

Although the data on commercialisation can tell us something about market participation, they only provide a partial picture of livelihoods. Especially for those crops where data on volumes sold and prices received are lacking, information on cash incomes is a necessary complement to analyse the effects of market participation on livelihoods. Given the widespread and persistent bias against women in smallholder agriculture noted in the literature, the expectation would be that the combination of poorer assets and smaller commercial opportunities for FMFs would translate into lower cash incomes, especially from farm-based sources.

For Afrint II, when the size and age composition of the household are controlled for, there were statistically significant gender-based differences in cash incomes for two countries only, Malawi and Zambia.[3] As suggested by the data in Table 5.1, these income gaps persisted into the final survey round, with gaps also emerging in Ghana and Kenya. In Kenya, with the largest gap, FMFs on average had cash incomes equivalent to 53 percent of their male counterparts, compared with 65 percent (Malawi) and 67 percent (Ghana and Zambia) for the other countries.

Table 5.1 Cash income per adult equivalent (mean and median), by country and sex of head of household, in 2010 (PPP adjusted USD) for households that had cash income

	Afrint II								Afrint III							
	Mean						Median		Mean						Median	
	Male	N	Female	N	Diff	Sig.	Male	Female	Male	N	Female	N	Diff	Sig.	Male	Female
Ghana	316	441	327	107			136	159	445	394	297	107	148	**	161	148
Kenya	768	169	943	89			376	406	661	184	351	103	310	***	351	178
Malawi	144	214	114	162	29	**	102	61	94	257	61	115	33	***	64	34
Tanzania	286	272	273	61			180	105	285	276	249	88			180	142
Zambia	202	286	151	71	52	**	147	87	256	331	171	95	86	***	154	135
Mozambique	98	247	82	89			34	38	190	211	238	146			90	88

Notes: The large differences between median and mean cash incomes for both household types, suggests that incomes are highly skewed, regardless of the sex of head of household. For Afrint II, data on household members below 15 and above 61 had many cases coded as uncodeable and missing, these were recoded as zero, which may underestimate the size of households for Afrint II, consequently overestimating the size of incomes per adult equivalent. For Afrint III the data was much better, and uncodeable and do not know responses were kept. Households that had skipped the question were, however, assumed to have zero household members of these ages. Extreme cases have been removed at village level for the final variable.

Although MMFs were advantaged in Zambia with respect to agricultural commercialisation, especially in maize, in Kenya by contrast there were no statistically significant gender-based differences with respect to market participation in any of the crop types, except for sugar cane for which there was a very weak statistical significance. In the case of Kenya, however, the tenuous link between the data on commercialisation and incomes can be explained by the fact that, with the exception of maize, we do not have information on the amounts sold for the particular crops. Similarly, the male biases in market participation for other food crops and cash crops are not reflected in the cash income data for Mozambique.

The farm-based sources of gender gaps in cash income in Ghana, Kenya, Malawi and Zambia can be found by breaking the cash income per adult equivalent by the particular sources of income, as is done in Table 5.2. In the case of Malawi, sale of all types of crops are biased towards male farm managers in both years. For Zambia, the gender gap in maize sales is reflected in the income data on staple sales. Higher male incomes from cash crop sales are to be expected in Malawi and Zambia where production itself is segmented by gender. In Kenya and Ghana, sale of animal products have become biased towards MMFs, although for Ghana the largest gender gap is found in incomes generated from the sale of other food crops. On the whole therefore, countrywide trends in market participation and production of cash crops are also reflected in the various income streams.

Table 5.2 Income per adult equivalent by sex of farm manager and income type, in 2010 (PPP adjusted USD) for households that had cash income

		Afrint II						Afrint III					
		Male	N	Female	N	Diff.	Sig.	Male	N	Female	N	Diff.	Sig.
Ghana	Staple Sales	98	440	103	106			75	394	40	107	34	*
	Sale of other food Crops	89	441	90	107			189	394	79	107	110	**
	Sale of non-food cash crops	8	440	5	107			20	394	11	107		
	Sale of animal produce	35	441	33	107			18	394	11	107	7	**
	Leasing out machinery	1	441	0	107			1	394	0	107		
	Agricultural labour	1	441	3	107			4	394	2	107		
	Non-farm salaried employment	27	441	7	107			22	394	15	107		
	Micro-business	26	441	45	107			90	394	81	107		
	Larg-scale business	11	441	9	107			0	394	0	107		
	Rent, Interest	0	441	0	107			2	394	0	107		
	Pensions	5	441	0	107			5	394	0	107	5	*
	Remittances	15	440	33	107	-19	**	19	394	57	107	-28	***
Kenya	Staple Sales	20	169	27	89			61	184	46	103		
	Sale of other food Crops	223	169	273	89			70	184	51	103		
	Sale of non-food cash crops	146	169	143	89			140	184	75	103	65	*
	Sale of animal produce	224	169	159	89			133	184	77	103	56	**
	Leasing out machinery	0	169	0	89			5	184	1	103		
	Agricultural labour	27	169	60	89			22	184	16	103		
	Non-farm salaried employment	89	169	192	89			129	184	25	103	104	**
	Micro-business	18	169	48	89			38	184	27	103		
	Larg-scale business	1	169	7	89			6	184	0	103		
	Rent, Interest	0	169	0	89			12	184	4	103		
	Pensions	7	169	15	89			22	184	3	103	19	*
	Remittances	12	169	21	89			23	184	25	103		
Malawi	Staple Sales	27	210	15	156	12	***	18	257	7	115	11	***
	Sale of other food Crops	33	214	16	161	18	***	28	257	16	115	12	***
	Sale of non-food cash crops	20	213	3	161	17	***	10	257	1	115	8	***
	Sale of animal produce	8	212	9	162			5	257	3	115		
	Leasing out machinery	2	213	1	161	1	*	1	257	0	115		
	Agricultural labour	6	214	5	162			3	257	7	115	-4	***
	Non-farm salaried employment	30	213	40	162			15	257	14	115		
	Micro-business	15	212	21	160			12	257	8	115		
	Large-scale business	0	213	0	161			0	257	0	115		
	Rent, Interest	0	214	0	160			1	257	1	115		
	Pensions	0	213	0	162			0	257	0	115		
	Remittances	4	210	6	159			2	257	3	115		
Tanzania	Staple Sales	84	272	50	61	34	*	105	276	111	88		
	Sale of other food Crops	41	272	10	61	30	**	41	276	22	88	19	*
	Sale of non-food cash crops	30	272	8	61			34	276	21	88		
	Sale of animal produce	21	272	11	61			13	276	10	88		
	Leasing out machinery	1	272	0	61			4	276	0	88		
	Agricultural labour	4	272	9	61			7	276	10	88		
	Non-farm salaried employment	29	272	106	61			9	276	5	88		
	Micro-business	68	272	60	61			60	276	61	88		
	Larg-scale business	0	272	0	61			3	276	0	88		
	Rent, Interest	4	272	1	61			3	276	1	88		
	Pensions	1	272	0	61			1	276	0	88		
	Remittances	2	272	17	61	-15	***	5	276	8	88		

Zambia	Staple Sales	68	286	19	71	49	***	138	286	71	95	68	***
	Sale of other food Crops	33	286	21	71			31	286	22	95		
	Sale of non-food cash crops	22	286	13	71			14	286	5	95	9	**
	Sale of animal produce	14	286	9	71			22	286	12	95		
	Leasing out machinery	3	286	2	71			2	286	2	95		
	Agricultural labour	9	286	18	71			10	286	11	95		
	Non-farm salaried employment	16	286	25	71			12	286	3	95		
	Micro-business	27	286	23	71			18	286	30	95		
	Larg-scale business	0	286	0	71			3	286	0	95		
	Rent, Interest	0	286	2	71	-2	**	1	286	1	95		
	Pensions	1	286	1	71			0	286	0	95		
	Remittances	9	286	20	71	-10	*	4	286	14	95	-10	***
Mozambique	Staple Sales	12	247	7	89			20	286	11	145	9	*
	Sale of other food Crops	5	247	1	89	3	**	17	247	14	144		
	Sale of non-food cash crops	4	247	1	89			11	247	12	145		
	Sale of animal produce	2	247	3	89			9	247	18	146		
	Leasing out machinery	0	247	1	89	-1	***	1	247	0	145		
	Agricultural labour	1	247	8	89			7	247	6	146		
	Non-farm salaried employment	18	247	18	89	25	*	33	247	82	143	-49	**
	Micro-business	44	247	19	89			79	247	77	140		
	Larg-scale business	0	247	0	89			3	247	1	146		
	Rent, Interest	0	247	0	89			3	247	0	146		
	Pensions	7	247	7	89			5	247	6	145		
	Remittances	5	247	17	89	-12	***	6	247	17	146	-11	**

Notes: Negative differences denote a bias towards female-headed households, and positive differences a bias towards male-headed households. No extreme cases were removed.

Juxtaposing farm-based sources of cash income with incomes from non-agricultural activities, points to some interesting differences between the households of male and female farm managers. In Afrint II, although gender-based differences were few, they were all biasing female farm managers, with the exception of micro-business in Mozambique. Incomes raised from remittances were higher among female-headed households in all countries except Kenya and Malawi. In addition, non-farm salaried employment was much higher for female respondents in Tanzania: 106 PPP adjusted 2010 USD per consumption unit compared with 29 for male farm managers. By the final survey round, remittances were still predominantly a female source of income in Ghana, Zambia and Mozambique, whereas a relatively large male bias in salaried employment in the case of Kenya had emerged, contributing to the overall gender gap in cash incomes noted for Kenya. In general, however, the gendered segmentation among non-farm activities noted in the literature, where women are confined to low entry, low-gain activities are not apparent from the data.

6. COMMERCIALISATION AND LIVELIHOODS BY TYPE OF FEMALE-HEADED HOUSEHOLD

Asset availability among ***de facto*** and ***de jure*** female-headed households vary, especially with respect to land. The demographic profile of ***de facto*** female-headed households resembles that of male-headed households more closely than that of ***de jure*** female-headed households. On this basis, the expectation would be that there are differences in patterns of commercialisation between the two household types. The data from Afrint III show no differences in the volume of maize sold, however, and a significantly higher share of maize production sold for ***de jure*** female-headed households, who sold 42 percent of their harvest compared with 34 percent for the ***de facto*** female-headed households (significant at the 5 percent level). Mean output prices received for maize are the same for both household types.

For the other crop types, only two crops are grown by large enough numbers of respondents to enable comparison: groundnuts and vegetables. For these crops commercialisation is more pronounced among the ***de facto*** female-headed households. Groundnuts were sold by 42 percent of the latter, compared with 22 percent for the ***de jure*** female-headed households, while 58 percent of the ***de facto*** female-headed households sold vegetables, compared with 44 percent of the ***de jure*** female-headed households. The concentration of particular crops to the regions where the ***de facto*** female-headed households are strongly overrepresented (Nyeri and Kakamega in Kenya and the Centre in Mozambique) may explain these tendencies, however.

The ***de facto*** female-headed households had considerably higher mean cash incomes per consumption unit than their ***de jure*** counterparts: 313 USD and 207 USD (PPP adjusted, at 2010 years value) respectively. On average, the incomes of the latter were more than 100 USD lower. While access to the incomes from absent husbands may be one explanation for this difference, the other may be related to the concentration of ***de facto*** female-headed households to the wealthier countries in the sample (especially Kenya) and the relatively large share of ***de jure*** female-headed households in Malawi.

In terms of particular sources of income, two farm-based sources bias ***de facto*** female-headed households: sale of animal products and cash crops (both of which are important components of livelihoods in Nyeri and Kakamega). For the non-farm income streams, salaries and micro-businesses are also skewed towards these households, whereas somewhat counterintuitively, remittances favour ***de jure*** female-headed households. This hints at an age component, with remittances being likely to be related to transfers from adult children towards widowed women.

7. DISTRIBUTIONAL ASPECTS OF COMMERCIALISATION

While the data presented so far shows the existence of gender-based differences in commercialisation in certain countries at particular points in time and some variation with respect to commercialisation between *de jure* and *de facto* female-headed households, further variation may be found *within* the broad groups of male- and female-managed farms. While FMFs generally cultivate smaller areas, and also have lower access to other agricultural assets than MMFs, considerable heterogeneity may exist within these groups in terms of resources that affect productivity as well as opportunities for market engagement. As noted initially, maize is the most commonly grown and marketed crop across the six countries. Scrutinising the patterns of maize commercialisation with respect to socio-economic difference within the broad groups of male- and female-managed farms can provide insights into the variability of market engagement within these categories.

Housing standard constitutes a robust variable for tracing socioeconomic differences across time and space – this metric is not sensitive to differences in cropping systems nor to fluctuations in exchange rates or purchasing power parity (PPP). While housing standards may be generally higher or lower in certain countries, the respondents with the highest housing standards are likely to be the best off in relative terms.

Three standards of housing were identified in the survey: mud house with thatched roof, mud houses with corrugated iron roof and block/brick houses with corrugated iron roof, and other advanced housing. Here country differences are pronounced: by the time of Afrint III, Tanzania had the highest overall housing standard and around 60 percent of the sample lived in the superior housing type, whereas in Mozambique just over a fifth did.

The ideal would have been to break the data by the three types of housing standard, sex of farm manager and country, but unfortunately the sample sizes are too small to enable this, so households with the highest housing standard are compared with the rest of the sample for FMFs and MMFs respectively.

Table 7.1 Commercialisation in maize by country, sex of farm manager and housing standard, Afrint III, for maize producers

		MMF						FMF					
		Basic	N	Advanced	N	Diff.	Sig.	Basic	N	Advanced	N	Diff.	
Ghana	Market Participation	0.51	252	0.80	85	0.29	***	0.50	56	0.64	25		
	Share sold of product	0.52	129	0.65	68	0.13	***	0.51	28	0.59	16		
	Sale of maize.kg	601	126	765	61	164	**	446	28	375	16		
Kenya	Market Participation	0.40	85	0.29	108			0.29	52	0.38	55		
	Share sold of product	0.40	34	0.47	31			0.35	15	0.41	21		
	Sale of maize.kg	727	33	643	30			357	15	503	20		
Malawi	Market Participation	0.40	197	0.49	71			0.28	103	0.19	21		
	Share sold of product	0.20	78	0.25	35	0.05	*	0.22	29	0.30	4		
	Sale of maize.kg	251	76	312	27			204	29	433	3		
Tanzania	Market Participation	0.42	96	0.65	175	0.23	***	0.54	41	0.67	39		
	Share sold of product	0.41	40	0.44	113			0.50	21	0.49	26		
	Sale of maize.kg	834	40	910	109			761	20	643	26		
Zambia	Market Participation	0.75	208	0.86	147	0.11	**	0.57	82	0.68	25		
	Share sold of product	0.53	157	0.60	127	0.07	**	0.46	47	0.47	17		
	Sale of maize.kg	2080	155	4165	114	2085	***	974	46	1721	17	747	**
Mozambique	Market Participation	0.20	147	0.42	26	0.22	**	0.25	96	0.30	44		
	Share sold of product	0.26	28	0.46	11	0.20	**	0.25	23	0.19	13		
	Sale of maize.kg	202	28	230	6			127	22	291	13	163	**

Some caution is needed when interpreting the results in Table 7.1: the number of cases is very small for the commercialisation indicators that are based on production – especially for the FMF. This may explain why statistical significance is not attained even though differences with respect to commercialisation are at times quite large between households of female farm managers living in advanced and basic housing respectively.

While this is clearly a rough measurement of wealth and welfare, some interesting results do emerge: for countries where market participation generally is high (Ghana, Zambia and to some extent Tanzania), among the MMFs commercialisation is tilted towards respondents living in advanced housing. While there are few statistically significant differences for FMFs, this distributional profile is not replicated for these households, with the exception of volumes sold in Zambia, where differences are substantial between the better-off female farm managers and the rest. In the case of Zambia – where maize is most strongly commercialised, gender-based differences in commercialisation are the most pronounced as are the differences within the two groups. Overall, commercialisation is therefore biased towards MMFs and towards the wealthier farm managers within MMFs and FMFs respectively.

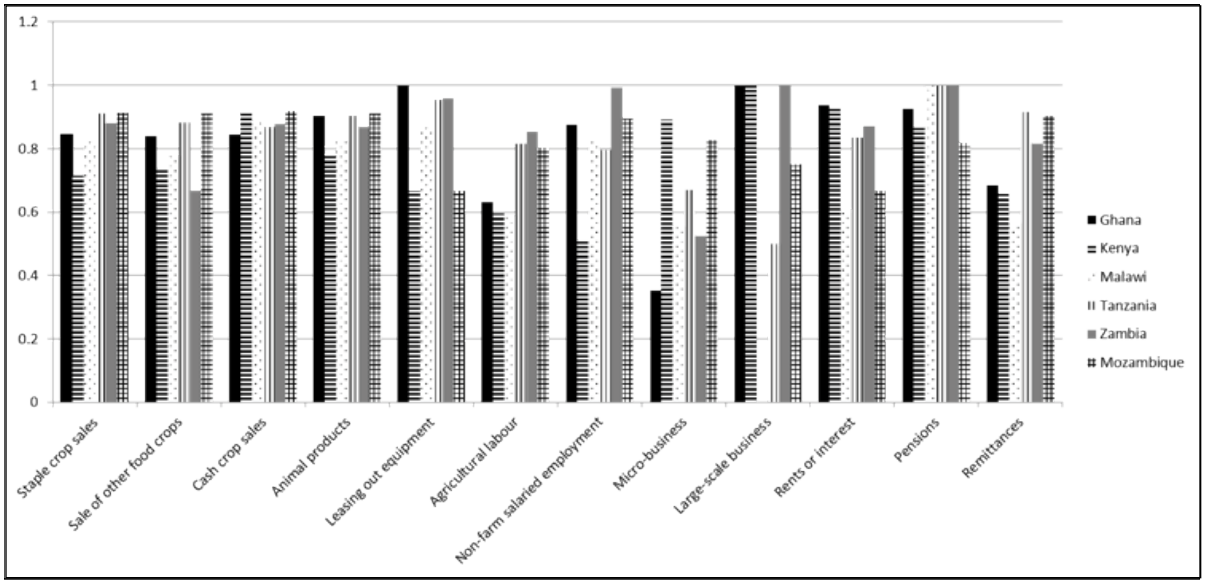
8. INTRA-HOUSEHOLD INCOME GENERATION

So far the results presented have concerned gender-based differences in commercialisation and cash income sources between MMFs and FMFs. While this to date is the most common method of analysing gender in studies of agriculture (Doss 2014), most women in rural Africa live in the households of male farm managers.

The dataset does not cover individual data on production and commercialisation, but it contains individualised cash income data by sex for Afrint III. Although this data clearly is a fractional representation of intra-household gender relations it does enable identifying livelihood sources by sex, and intra-household complementarities in this respect (Jackson 2007).

Figure 8.1 shows the share of cash income raised by males in the households of male farm managers. Here shares higher than 50 percent point to a male bias in particular income sources and one below 50 percent indicate a female bias. This assumes an on average equal number of male and female members in the households of male farm managers, but given the large number of households, a systematic bias is not likely.

Figure 8.1 Share of cash income raised by males in male-headed households, by income source and country, Afrint III



All farm-based sources of cash income generate higher incomes for men across the countries, pointing to a higher engagement with markets among men in male-headed households. In turn, this suggests an intra-household division of labour where women are engaged mostly in unremunerated work – whether in production or reproduction. Qualitative data from Malawi confirms this division of labour – while agricultural production is carried out by both spouses, often with the explicitly stated aim of feeding the family, marketing decisions and the practicalities of commercialisation, such as reaching markets and selling products, were generally the responsibility of the husband. The reasons for this were varied but revolved largely around the limitations to female mobility imposed by domestic responsibilities, but also in some cases the distrust expressed by husbands concerning their wives' ability to handle incomes from sales.

For non-farm activities, the differentiation of highly remunerative pursuits by gender referred to in the literature is only partially reflected in the data: in general, incomes raised from non-farm activities are dominated by male household members, with a few exceptions. In Kenya, men and women raise income from non-farm salaried employment more or less to the same extent, while micro-business is biased towards women in Ghana. In Malawi and Zambia, female and male

household members generate roughly equal amounts of cash income from micro-business. On the whole though, the data shows a prevalent bias against female members of the households of male farm managers, regardless of the type of income source.

Theoretical perspectives on female empowerment place great faith in the transformative capacity of women's income generation as a source of enhanced female bargaining power within households headed by men. Nonetheless, women across the three Malawian villages covered by the qualitative data all report that they are expected to disclose cash incomes generated both through sale of agricultural products as well as non-farm activities to their husbands. Two women stated that they were required to do so but chose to defy this norm to preserve some financial independence from their husbands. While husbands in general also claimed to adhere to similar expectations from their wives, this was disputed by many of the female respondents. Moreover, even if cash income was used for family needs, in general one of the husband's prerogatives is to decide on the use of generated income, although this varies among villages under patrilineal and matrilineal tenure with stronger female involvement in expenditure decisions in the latter (Andersson Djurfeldt, Mulwafu et al. 2017, submitted).

9. REGIONAL PERSPECTIVES ON LIVELIHOOD DIVERSIFICATION AND GENDER

The data presented above have illustrated the contextual nature of agricultural commercialisation and sources of income even at the country level. The point is often made, however, that gender relations as well as gendered patterns of production and marketing are context specific, distinguished by regional or even village-level features. Indeed, the notion of women's crops is increasingly being questioned in the literature and, as shown above, patterns of commercialisation vary across time and space even at the macro scale.

To what extent differences in gender-based cash incomes can be attributed to regional production patterns and marketing arrangements that depart from and reinforce gender-based divisions of labour and commercialisation patterns is the subject to which I turn next.

In Table 9.1, the sample is divided by region as well as by sex of farm manager. This shows how the country-level gender-based income gaps (documented in Table 4.3) are concentrated to one region in Ghana and Zambia, respectively. In the case of Kenya and Malawi, while there are statistically significant differences for all regions, caution is warranted for those regions where statistical significance is only possible to establish at the 10 percent level. Moreover, differences in income are larger in one region in each country (Kakamega in Kenya, and Shire Highlands in Malawi).

Table 9.1 Income per adult equivalent by sex of head of household and region, Afrint III, in 2010 (PPP adjusted USD)

		MMF	N	FMF	N	Diff.	Sig.
Ghana	Eastern	830	179	458	55	371	**
	Upper East	125	215	127	52		
Kenya	Nyeri	397	85	223	56		
	Kakamega	888	99	504	47	385	**
Malawi	Ntchisi	82	76	52	18		
	Thiwi Lifidzi	97	60	64	31		
	Bwanje Valley	62	66	28	24	34	**
	Shire Highlands	146	55	81	42	65	*
Tanzania	Kilombero	327	152	278	36		
	Iringa	234	124	229	52		
Zambia	Mkushi	232	168	140	61	92	**
	Mazabuka	282	163	226	34		
Mozambique	North	90	119	84	30		
	Centre	356	76	365	80		
	South	142	15	84	36		

Statistical testing of gender-based differences of means for particular sources of income is generally difficult, since small sample sizes result from dividing income data further. To the extent that statistical significance can be established, some interesting differences as well as similarities emerge: raising income through sale of agricultural labour is biased towards the households of female farm managers in three regions (Nyeri, Kenya, and Ntchisi and Shire Highlands both in Malawi) – but only in one of these is the difference statistically significant at below 5 percent. Both regions in Zambia have higher incomes from staple sales among MMFs, but only in the case of Mkushi does this translate into higher cash incomes overall. In the Eastern Region in Ghana, larger incomes raised from the sale of staple crops also explains higher incomes for MMFs. In the

case of the Eastern Region, incomes generated from the marketing of other food crops are important as well. The vibrant tomato trade noted during fieldwork in 2011 may be a possible explanation for the income discrepancies between MMF and FMFs (Andersson Djurfeldt, Djurfeldt et al. 2014). Depending on regional characteristics, other food crops and animal produce also generate more incomes for the households of male farm managers in some regions.

For non-farm income sources very few gender-based differences exist at the regional level. To the extent that they do, incomes from remittances are biased towards the households of female farm managers. Incomes raised from micro-business are also larger for FMFs in Mazabuka, Zambia and the two regions in Ghana. To some extent, this compensates for lacking farm incomes among female farm managers. Indeed, in the case of Mazabuka, Zambia and the Upper East, Ghana, there are no statistically significant differences in cash incomes between MMFs and FMFs. In the case of the Kenyan regions, by contrast gender gaps in total cash income are related to non-farm sources of income. Salaried employment and pensions are skewed towards MMFs in the case of Kakamega and Nyeri respectively.

Although regional patterns of intra-household access to income within households headed by male farm managers largely replicate the country level, some interesting differences emerge between the regions. Three cases of farm incomes are biased towards women: the sale of other food crops in Mazabuka, Zambia and leasing out agricultural equipment in Kakamega, Kenya and the sale of farm labour in Kakamega, Kenya and South, Mozambique. Leasing out equipment is a very rare source of income, however, and the results should be treated with much caution.

Intra-household biases towards women are found with respect to micro-business involvement in four regions: Shire Highlands (Malawi), Eastern and Upper East (Ghana) and Mazabuka, Zambia. In the case of Mazabuka and the two regions in Ghana, this pattern mirrors the gap between MMFs and FMFs, suggesting a stronger involvement of women in general in micro-business in these regions. Key informant interviews with the chief and headmen from Nikantaka village in Mazabuka point to the emergence of several non-farm opportunities connected to the Zambia Sugar processing plant in Mazabuka. Moreover, a nickel mine was established in the village in 2006 by an Australian company, which provided jobs as well as a demand for services (interview with Chief Nawulama, 12 October 2012). Although the mining company had pulled out of the village by the time of the interviews in 2012, female focus group discussions as well as interviews with traders in the local trading centre confirmed the continued importance and dynamism of small-scale trading and the engagement of women in this trade. A similar pattern was reported in the qualitative data for both regions in Ghana. In the Upper East there is a seasonal pattern to some of these activities, with artisanal small-scale mining and alcohol production and sale being carried out in the off season. The villages in the Eastern region are strategically located with respect to trade in vegetables as well as textiles with neighbouring countries.

In the two regions in Ghana and Mazabuka in Zambia, the segmentation of income opportunities by gender occurs both between male- and female-headed households as well as within male-headed households, but this stratification by gender appears to be complementary rather than competing. These regions are in the minority, however. Rather, the same patterns of lower female incomes characterise both the country and regional levels, pointing to the limited possibilities for women to raise individual incomes within male-headed households.

10. CONCLUSIONS

This paper set out with the empiricist aspiration to address the gendered aspects of commercialisation, diversification and rural livelihoods. A number of key findings can be reported: agricultural commercialisation if measured through market participation is not generally segmented by gender although exceptions exist both nationally and regionally and with respect to particular crops. The data do not suggest a discrimination against female farmers with respect to prices received or the segmentation of particular marketing channels by gender, however. The exception here is tobacco in Malawi where institutional discrimination against women prevents female participation.

The results also contradict the common perception in the literature that commercialisation of food crops leads to male dominance of markets over time; rather the patterns are fluid, with both male and female farmers moving in and out of markets as opportunities change. Nonetheless, particular countries stand out with respect to certain crops: for maize, a growing bias against female farm managers can be noted with respect to all measurements of commercialisation in Zambia. Mozambique, Malawi and to a lesser extent Tanzania stand out in terms of non-grain food crops, where market participation by MMFs has increased relative to FMFs between 2008 and 2013.

In the case of maize, poorer commercial possibilities for female farm managers appear to be tied strongly to production factors, where lack of labour and land prevent the generation of a marketable surplus. The combination of domestic work with sole responsibility for farming in highly labour-intensive production systems was repeatedly mentioned in the qualitative interviews as the main difficulty facing female farm managers. While the gender-based gaps in total household cash income were limited to Malawi and Zambia in 2008, by 2013 MMFs were on average earning higher cash incomes in Kenya and Ghana as well. The explanation for MMFs' higher cash incomes is that farm-based incomes are generally higher, with non-farm income sources earned by the households of female farm managers not being able to compensate for this relative shortfall. To the extent that agricultural commercialisation has increased since 2008 – as has been the case particularly in Zambia – while female farm managers relatively speaking were better off in 2013, commercialisation has disproportionately advantaged their male counterparts.

Intra-household gaps in cash income largely replicate the gaps found between MMFs and FMFs in terms of income sources, but intra-household gaps are in fact generally larger than the gaps found between the households of male and female farm managers. Male household members generate the bulk of cash in households headed by male farm managers, whether from within or outside farming.

With respect to agricultural commercialisation, the gendered patterns suggest an important distinction between women who manage their own farms and women who live in households headed by men. Whereas the constraints for the former appear to lie in the lack of access to resources, especially land and to some degree labour, that can be used to generate a marketable surplus, the disincentives to commercialisation may be more forthcoming for the latter, as the outcomes from sales are controlled by their husbands. What unites both groups of women are the restrictions to commercialisation imposed by lacking mobility, in turn related to domestic responsibilities and cultural mores that impede physical movement. Institutional segmentation of markets by gender through male membership requirements in trading associations or contracting arrangements that exclude women impose further barriers to commercialisation among women.

Analysing the data by region rather than country shows that also at this level income gaps are explained by higher incomes from farm-based sources in male-headed households. By contrast, in some regions without gender-based income gaps, income generated from non-farm activities by female-headed households to some extent explain the absence of such gaps. While intra-household data at the regional level point to a handful of income sources (both farm and non-farm-based) that are biased towards women, in general the data on cash incomes, whether at country, household or individual level points to the very limited possibilities for women to raise any type of cash income.

The mantra of 'linking smallholders to markets' has become something of an article of faith in pro-poor growth perspectives – with the 'business case' for addressing gender gaps in agriculture dovetailing with the 'social justice case' of enhancing women's empowerment through earning individual cash incomes. Theoretically, female bargaining power can be improved through generating incomes either from agriculture or non-farm sources. The data suggests, however, that rural livelihoods are predominantly based on agrarian sources of income, which in turn are based on productive assets that are unequally distributed by gender – whether among or within households. Hence, the prospects for linking female farmers to markets are dimmed not by the institutional mechanisms of markets in themselves, but by the structural inability of female farmers to produce a marketable surplus. In this regard, non-farm sources of constraints on commercialisation also need to be recognised; for instance, the labour-intensive drudgery characteristic of women's lives in many parts of sub-Saharan Africa. While agricultural technology may be relevant to raise yields among female farmers through improved inputs for instance, non-agricultural interventions to ease constraints on women's labour and mobility, such as addressing the ill health of young children and improving access to water for domestic use may be equally important.

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ENDNOTES

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2 www.keg.lu.se/en/research/research-projects/current-research-projects/afrint

3 This contradicts data presented in an earlier paper (Andersson Djurfeldt, Djurfeldt et al. (2013). The reason for the discrepancy is the treatment of extreme cases: in this paper, extreme cases have been removed only for the final variable.

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