Original Article

Linking Smallholder Farmers to Markets, Gender and Intra-Household Dynamics: Does the Choice of Commodity Matter?

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Abstract Linking smallholder farmers to markets and making markets work for the poor is increasingly becoming an important part of the global research and development agenda. Organizations have used various strategies to link farmers to markets. These approaches have mainly been evaluated for their potential to increase participation in markets and household incomes. The evaluations have assumed a unitary household where income and resources are pooled and allocated according to a joint utility function. In most households, however, income is rarely pooled and neither are resources jointly allocated. This article uses data from Malawi and Uganda to analyze what influences income distribution between men and women, focusing on the type of commodity, type of market and approaches used. The results indicate that commodities generating lower average revenues are more likely to be controlled by women, whereas men control commodities that are high revenue generators, often sold in formal markets.

Relier les petits agriculteurs aux marchés et faire en sorte que ces derniers servent les pauvres sont des objectifs qui prennent une importance grandissante dans les programmes mondiaux de recherche et de développement. Les organisations ont mobilisé diverses stratégies pour relier les agriculteurs aux marchés. Ces approches ont surtout été évaluées pour leur capacité potentielle à accroître la participation aux marchés et les revenus des ménages. Les estimations sont basées sur l'hypothèse du ménage unitaire dont les revenus et ressources sont regroupés et répartis selon une fonction d'utilité commune. Dans la plupart des ménages, cependant, les revenus sont rarement mis en commun et les ressources ne proviennent pas non plus d'une seule source. Cet article s'appuie sur des données concernant le Malawi et l'Ouganda pour analyser ce qui influence la répartition des revenus entre hommes et femmes, en portant une attention particulière aux types de marchandises, de marchés et d'approches utilisés. Les résultats indiquent que les produits qui génèrent le moins de revenus sont généralement l'affaire des femmes alors que les hommes se chargent des denrées qui génèrent le plus de revenus, et qui sont souvent vendues sur les marchés formels.

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Introduction

There is a growing recognition within the agricultural research and development community of the need for smallholder producers to shift traditional farming strategies to more innovative farming. This shift is expected to lead to better farm incomes through linking farmers to markets. Different organizations are using different approaches to link smallholder farmers to markets, including provision of market information, organizing

farmers into groups, associations or cooperatives, contract farming and out-grower schemes. Most of these approaches have been evaluated based on increases in household incomes, access to higher value markets and therefore higher prices for smallholder farmers and growth of market opportunities, including export markets (Warning and Key, 2002; Winter *et al*, 2005; Saigenji and Zeller, 2009). Other evaluations have focused on potential advantages for farmers such as access to inputs, credit and technological and extension advice from organizations facilitating the linkages or from the buyers to whom farmers are linked. By linking with buyers in advance of production, farmers potentially have a more assured market and often an agreed price, greatly reducing risk for farmers.

It is, however, widely recognized that market-oriented production can result in the capture of the benefits by the rich, to the detriment of the poor. It can also create a privileged group of farmers with exclusive access to a new technology. Evidence shows that in some instances increased access to market opportunities can open up competition by other producers, driving local producers out of production (Dorward *et al*, 2003), or allowing powerful elites to capture new economic opportunities that were previously undertaken by the poor. Minten and Barrett (2008) highlight how poorer households in rural Madagascar had been effectively excluded by credit, insurance and labor constraints from uptake of promising production technologies that wealthier farmers were able to use, and subsequently raise their rice yields by 60–80 per cent.

From a gender perspective, there is evidence that women face more constraints as they endeavor to engage with market systems. Empirical studies on intra-household gender dynamics in Africa have shown that when a crop enters the market economy, men are likely to take over from women, and women therefore do not benefit from market-oriented production (von Braun, 1988; von Braun *et al*, 1989). On the other hand, social and cultural roles may assign productive and reproductive roles to men and women that can affect their access to markets (OECD, 2004). For example, in many cultures, women's role of household provisioning versus the men's role of providing cash requirements of the household may affect women's ability to participate in markets. Kaaria and Ashby (2001), in a review of literature, found that poor rural women are often excluded from accessing the more lucrative markets. The review found that in various instances women did not benefit from market linkages because of men taking over the commodity once it became profitable. To avoid men taking over, women often selected commodities with lower value, and a lower return, which did not interest men.

Most of the analysis on farmer market linkages is based on patriarchal theories that assume a unitary household model. The unitary model of the household makes several assumptions; first, that the household is a single unit and there exists a welfare function that reflects the preference of all its members; second, that within the household there is pooling of resources with the result that all household members enjoy the same level of welfare; and third, that the household head is an altruist who takes into account the wellbeing of other members of the household (Haddad *et al*, 1994: Kanji, 2004). There is, however, evidence that households do not actually function as single units and that individual household members are likely to have different preferences (Chiappori *et al*, 1993). Studies also show that pooling of resources by household members does not always happen and neither do all household members enjoy benefits equally (Bruce and Dwyer, 1988; Freidmann, 1992; Moore, 1992).

An alternative theory, the collective model offers a better representation of the realities of household behavior (Chiappori *et al*, 1993). The collective model can be cooperative or non-cooperative. In the non-cooperative model, individuals within the households have

different preferences and operate as autonomous sub-economies with each individual controlling their income, and purchasing commodities depending on their individual income constraints and their preferences. On the other hand, the cooperative model argues that individuals have a choice of acting as individuals or pooling resources and behaving as households. Men and women can therefore choose to pool all resources together or they can pool some resources and retain others as individuals and spend them for their individual benefit and not the benefit of all household members. On the basis of these arguments, Falkingham and Baschieri (2009) argue that defining measures such as poverty and income at household level, and assuming that people living within such households enjoy the same living standards, can be misleading.

Another typical assumption on commercialization and household income is that increase in income leads to more development and welfare benefits to individual household members. These welfare benefits can occur through two main pathways; first, through increasing household income, which results in the purchasing of a diversified mix of goods and services (such as health care, better housing and so on); and second, by increasing the food intake of household members, which could improve their nutritional and health status (Kennedy, 1994).

Studies on the links between increased income and development outcomes have, however, not been conclusive. In Kenya, Kennedy and Cogill (1987) found that a 1 per cent increase in sugarcane income in South Nyanza District in Kenya resulted in an increase in energy intake of 24 kilocalories per household per day. On average, sugarcane production increased household income by 15 per cent, which increased household energy intake by 360 kilocalories per day, or approximately 33 kilocalories per day per person in the household. Later analysis by Kennedy (1994), using case studies from Gambia, Rwanda, Kenya, Malawi, Philippines and Guatemala, found that there was no clear evidence that agricultural commercialization had an adverse effect on child nutrition.

Several issues can mediate between increased commercialization and improved development outcomes such as food security and nutrition. One is the dichotomy between food and cash crops. In this dichotomy, food crops are assumed to be used only for home consumption, and households are considered as net sellers in the cash crop output markets. This, however, is far from reality as food crops are also marketed, and indeed many organizations linking farmers to markets are moving away from traditional cash crops such as coffee, tea and tobacco to focus on traditional food crops because of their potential as market crops for both domestic and international markets (Gabre-Madhin *et al*, 2007; Pender and Alemu, 2007).

The second dichotomy is the control of income by men and women and the differential expenditure patterns of this income as suggested by the collective, non-cooperative household model. In this second dichotomy, it is assumed that men and women control different streams of income and also spend income under their control in different ways. Early literature on this subject showed that income from commercial (cash) crops was most often controlled by men (Kennedy and Cogill, 1987; Immink and Alarcon, 1993; Tinker, 1979 cited in Kennedy, 1994) and was mainly used for non-food expenditure (Kennedy and Cogill, 1987).

This article uses data from Malawi and Uganda to analyze the distribution of income between men and women in households, focusing on what influences women's control of income from agricultural markets, including the type of commodity and other community and individual characteristics. The article also focuses on the differences in expenditure patterns for income controlled by men and women.

Methodology

The study uses two sets of data. The first data set is from a cross-sectional survey of 457 households in Uganda and Malawi linked to different markets for different commodities. Data for the cross-sectional survey were collected from men and women, and included household demographics, crop and livestock production data, markets and amount of produce marketed, income and how it is shared within the household.

The second data set is from a more intensive panel data of households growing and marketing beans and potatoes over a 3-year period. The panel data were used to analyze changes in income control as the market participation of households deepened over this 3-year period. The panel data had two main sections, one section that was asked only once and included, among others, demographic data and asset ownership. A second part was collected at the start of every season and included amount for each commodity grown, amount produced, amount marketed, where marketed, income obtained, how it was shared and what it was spent on.

Comparison of income share between men and women and expenditure by both men and women was made using *t*-tests. A regression of the determinants of income share going to women was carried out. Owing to the nature of the analysis and the comparisons between men and women within households, the analysis used data from households with both male and female spouses, and therefore does not include women in female-headed households or men in male-headed households with no female spouses.

There are several limitations to the collection of income and expenditure data. The data are based on recall, and therefore households may not be able to report as accurately as when data are collected in real time. Farmers may also not honestly record expenditure data, especially in cases where it has been spent on leisure goods such as alcohol or cigarettes.

Results

Description of Farmers and Commodities

Table 1 shows the social and demographic profiles for smallholder farmers in Uganda and Malawi. There were some key differences across the two countries. Uganda had a slightly higher average family size of 5.93 persons compared with 5.49 for Malawi. Analysis in terms of annual income shows that households in Uganda have higher average annual family income of US$882, whereas Malawi's mean household income is $470. Households in Uganda own larger pieces of land, that is, 4.55 acres compared with 3.67 acres for Malawi. Eighty per cent of Ugandan farmers are members of farmer groups/associations, whereas only 47 per cent of farmers in Malawi belong to a farmer group.

Of the households interviewed, 37.2 per cent of the farms were managed by women. In Uganda, about half of the farms were managed by women, whereas 29.1 per cent of the farms in Malawi were managed by women. Farms managed by women were defined as those where women made the major decisions on agricultural production and marketing by virtue of the men either living away from home or being engaged in other full-time employment or business enterprise. More than half of the household heads in each country had primary education. In Malawi, 70.6 per cent of the heads of household had some primary education, whereas in Uganda this percentage was much lower (58.4 per cent).

Table 1: Selected social and demographic characteristics of households

	Malawi (n = 313)	*Uganda (n = 144)*	*Whole sample (n = 457)*
Sex of farm manager (%)			
• Male	70.9	44.5	62.8
• Female	29.1	45.5	37.2
Marital status (%)			
• Married	84.6	75.2	80.1
• Other	16.4	24.8	19.9
Education of household head (%)			
• No formal education	14.5	21.2	16.6
• Primary education	70.6	58.4	66.9
• Secondary education	14.8	14.6	14.8
• Post secondary education	—	5.8	1.8
Highest education level of female spouses (%)			
• No formal education	52.1	37.6	47.7
• Primary education	42.5	52.8	45.6
• Secondary education	5.1	6.4	5.5
• Post secondary education	0.3	1.6	0.7
Membership to farmer groups (%)	46.9	80	58.5
Total family size (number)	5	5.93	5.6
Age of household head (yeas)	42.9	40.8	42.2
Average annual income (USD)	470.2	783.7	567.3
Land ownership (acres)	3.67	4.55	3.94

Uganda had a higher percentage of household heads with no formal education than Malawi, and both countries had about the same proportion of household heads with secondary education. No household heads in Malawi had a post-secondary education, whereas in Uganda 5.8 per cent had a post-secondary education. In Malawi, 52.1 per cent of female members of households did not have formal education, whereas only 5.1 per cent had secondary education. In Uganda, a similar pattern was observed, with 37.6 per cent of women not having any formal education and only 6.4 per cent having secondary education.

Several commodities that farmers were actively marketing were included in the analysis. Table 2 shows the commodities and their contribution to total household income.

Rice, potatoes and milk made the highest contributions to household income with a contribution of 43.5, 37.2 and 31.6 per cent, respectively. Beans, potatoes and rice had the most number of farmers actively marketing them. Milk, potatoes and rice had the highest annual average income bringing in an average of $906.3, $270.1 and $232.5, respectively. Although milk gave the highest average annual income, dairy cattle were kept by relatively wealthier farmers who had multiple sources of income, and therefore milk still contributed less to the total household income than crops such as rice and potatoes. Goats, soybeans and groundnuts brought in the least annual income to households. Two commodities, organic ginger and pineapples were removed from the analysis because of too few households reporting income from these commodities.

Table 2: Summary of enterprises considered in the analysis

Enterprise	*Number of farmers actively marketing*	*Mean average annual income (USD)*	*% Contribution to total household income*
Beans	80	79.5	22.9
Potatoes	91	270.1	37.2
Groundnuts	62	73.6	11.9
Soybeans	14	70.8	29.5
Rice	90	232.5	43.5
Goats	55	53.4	22.2
Pigs	40	113.9	27.9
Milk	12	906.3	31.6
Poultry	16	77.8	16.1

Gender Differences in Income Control

Household income for smallholder farmers, especially those with limited off-farm opportunities, increases through commercialization of agricultural activities. The income that is generated from different commodities is shared differently between husband and wife. From the analysis of income control across different crop and livestock products, we find differences in income control between different groups of crops and within groups, for example, between legumes and other types of crops, but also among different legume crops.

Legumes

Data were available for three different legume crops, two that have traditionally been food crops (common bean and groundnuts) and are now getting more commercialized through sales to regional and export markets and one (soybean) that was introduced in the two countries as a commercial crop and for the management of soil fertility. The common bean (*Phaseolus vulgaris L.*) is a major source of protein in the Malawi diet, usually consumed with a maize-based porridge dish (nsima). Beans are grown in higher elevations in all three regions of Malawi, usually intercropped (mixed) or relay cropped (in sequence) with maize. As the beans have been exclusively grown for home consumption, at any one time there have been mixtures of between 2 and 36 different varieties growing per farm (Ferguson, 1994).

In Malawi, beans have been predominantly a women's crop, with about 90 per cent of the labor provided by women. Although the division of agricultural labor by gender varies both by crop and by region of the country, much of the agricultural work and decision making concerning beans has been carried out by women, and they are usually the most knowledgeable about the crop. In the early 1990s, a 'component breeding', program was initiated to breed and provide farmers with a greater range of varietal choice. This was aimed at improving yields while at the same time allowing for a greater number of varieties that met other characteristics, especially those that were important to women, such as cooking time and early maturity (Ferguson and Sprecher, 1990). Marketing of beans was mainly done by women, in local markets. With time, however, the breeding program started focusing on market characteristics, mainly driven by the large market demand for beans in South Africa and other countries. Owing to this demand from international export and regional markets, farmers started organizing for the production

of the common beans through farmer organizations supported by non-governmental organizations and the government.

Groundnuts have gone through the same kind of evolution in Malawi. The country's annual production of 80 000 tonnes of groundnuts comes from smallholder farmers. For a long time, groundnut was the most important legume grown in Malawi in terms of the total production and area under cultivation (Chiyembekeza *et al*, 1998). The crop provides an important source of food and cash income for smallholder farmers, and up till the mid-1990s was a key export crop (Babu *et al*, 1994; Dzilankhulani *et al*, 1998). However, production and export of the crop has steadily declined since the late 1980s as a result of declining area under production, reduced yields and poor post-harvest handling that led to high aflatoxin levels and rejection of groundnuts in the export markets. Similar to the common beans, most labor for groundnuts is provided by women. Local trade by women is common. However, as a result of projects and capacity building on aflatoxin management, and a focus on the crop by major companies and farmer associations such as the National Smallholder Farmer Association of Malawi, groundnuts have recently become an important export crop again.

Soybeans in Malawi started gaining importance when they were introduced as a cash crop and for the management of soil fertility. The main uses for soybean are the manufacture of infant foods, texturized protein and animal feeds. Smallholder farmers sell to middle men who bulk and sell to processing companies, who in turn process and sell the infant foods to supermarkets and relief agencies.

Figure 1 shows the share of income under the three legume crops managed by men and women. It was expected that women would have a higher income share from beans and groundnuts, which until recently has been a locally traded commodity compared with soybean, which has been introduced as a cash crop.

From Figure 1, groundnuts provided women with 43.7 per cent of income compared with beans, which provided 35 per cent, and soybeans, which provided 23 per cent. Men controlled and managed only 14.4 per cent of the income from groundnuts. Forty-two per cent of the income from groundnut was managed jointly. Jointly managed income was defined as income that either the man or the woman could make decisions on in terms of how it was used, as well as income that was used immediately by both the man and woman jointly for any household expenditure. In other words, it did not go to the

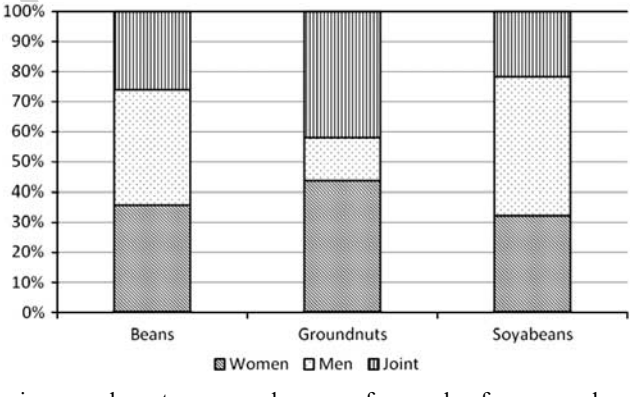

Figure 1: Percentage income share to men and women from sale of common beans, groundnuts and soybeans.

'pocket' of either one. Management and control was in this case defined in the sense that the money was in one's keep and whoever kept the money made decisions on how it was going to be used without necessarily consulting the other. Fisher *et al* (2010) in a study in southern Malawi reported that in interviewed households, as in much of rural Africa, the incomes earned by different household members are not always pooled into a single household income. Although sometimes agricultural incomes are combined into a single pool of 'family money', this is not always the case, especially where products are sold to different markets that have gender differentiation. In most cases, income belongs to the person who earned it and can be spent on whatever the earner chooses. The scenario of 'husband's money', 'wife's money' and 'family money' is often more common.

Income from soybeans was mainly managed by men, as expected. They controlled and managed 45.6 per cent of the income, whereas women managed and controlled 31.7 per cent of the income from soybeans. Common beans on the other hand exhibited a more equitable sharing of the income, with women managing 35.5 per cent of the income and men managing 38.4 per cent of the income, whereas the remaining 26.1 per cent was jointly managed.

Cereals and tubers

The other crops included in the analysis were rice in Malawi and potatoes in Uganda. These crops were included because both were under projects linking rice and potato farmers to markets. In Uganda, the Enabling Rural Innovations Project of the International Centre for Tropical Agriculture was organizing smallholder potato producers in South Western Uganda to link to the South Africa fast-food chain Nando's as suppliers of potatoes. In Malawi, a government program was rehabilitating a rice irrigation scheme in Southern Malawi and organizing farmers to link to better markets for their rice. Both of these crops are not what would traditionally be called 'women' crops and they therefore contrast very well with crops such as beans and groundnuts.

From Figure 2, most of the income earned from potatoes in Uganda was jointly managed and controlled by men and women. Women on their own controlled only 18.5 per cent of the income. In Malawi, women controlled 45.1 per cent of the income from rice, whereas men controlled 27.1 per cent. The remaining part was controlled and managed jointly by men and women.

Figure 2: Percentage income share to women from rice and potatoes in Uganda and Malawi.

Livestock and livestock products

Livestock are an important asset for many rural households. Their versatility is evident in the fact that livestock do not fall neatly into one of the five asset categories. Livestock can be productive assets (similar to land or machinery) and they can also serve as financial assets that allow households to 'store' their wealth. Livestock are an asset that women can relatively easily acquire and hold, either through inheritance, markets or collective action processes.

The demand for milk and meat is predicted to increase significantly across the developing world – the so-called 'Livestock Revolution' – leading to income generation from sale of livestock products, as well as employment opportunities along the value chain (Delgado *et al*, 1999). Despite their successes, women often face more challenges than men in accessing and benefiting from these opportunities, especially in more formal markets. In particular, the indirect consequences for women of 'gender-neutral' market development projects need to be carefully examined. This is because, where women have insecure rights over livestock, or limited control over livestock products and the income from their sale, they may have difficulty maintaining control if livestock become more economically attractive to men. The relative informality of livestock property rights compared with land or other physical or financial assets can therefore have negative effects when ownership is challenged, especially when livestock or products become commercialized and women's ownership is threatened.

Livestock and livestock products provide a somewhat different picture from crops. There is evidence of women ownership of small livestock such as goats and chicken compared with cattle (East Africa Dairy Development, 2009) in some communities. Even in cases where women may not control cattle themselves, they may have control over the products. For example, among the Fulani of Nigeria, women are responsible for all milk processing and marketing and decide on the quantity of the milk to be kept for consumption and for sale (Waters-Bayer, 1986). A study of evolving pastoral markets in North Eastern Somalia (Nori, 2008) documents the crucial role that women play in the commoditization of pastoral camel milk, which seems to be an important phenomenon characterizing many pastoral regions in the world.

Figure 3 shows gendered income control from different livestock and livestock products. Men controlled 69.1 and 87.3 per cent of the income from goats and pigs, respectively. Only 9 per cent of the income from pigs was controlled by women. This may be explained

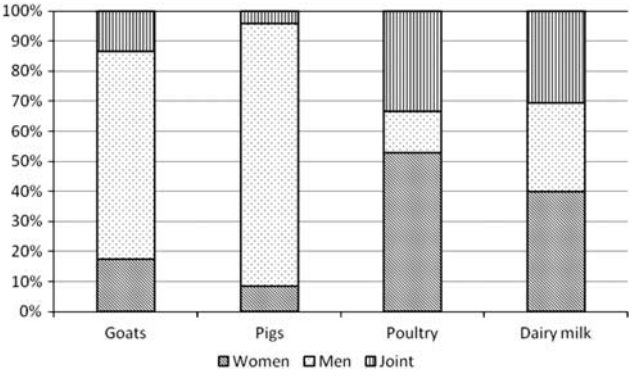

Figure 3: Percentage income share to men and women from sale of livestock and livestock products.

by the fact that sale of goats and pigs constitutes large sales and are managed by men. In Malawi, goats and pigs were mainly sold to middle men and men often used bicycles to transport the goats and pigs to the markets. Fifty-three per cent of the income from poultry was managed and controlled by women, with only 14 per cent going to men. These results are in line with a study in Guatemala that found that marketing of livestock more or less followed the same pattern as livestock ownership: women marketed and kept money from poultry and smaller animals, if such marketing was done at local markets (Katz, 1995). Men marketed the larger animals, typically to more distant markets. The same study, however, found that when poultry or livestock were marketed further away, the women often lost control over some or all of the income generated.

Women managed and controlled 39.8 per cent of the income from milk, with men managing 29.6 per cent of the income. Owing to low milk production, milk was mainly sold to neighbors and by the roadside often by women. Studies conducted among the Fulani in Nigeria (Waters-Bayer, 1985, 1988), and in Kenya, Uganda and Rwanda (EADD, 2009) showed that formalization of the milk market can erode the traditional female control of milk and its by-products, thereby decreasing their power within the household. For example, with the increased integration of the Fulani into commercial markets, men tended to take over milking of animals from women. In Senegal, in the Fulani societies in Ferlo, milk production and sales are controlled by women as they sell directly to consumers near the place of production or barter raw milk for cereals (Dieye *et al*, 2005). Similar evidence from East Africa shows that where the milk is sold and whether it is morning or evening milk has implications on whether or not women manage the income. Women have more control over the evening milk compared with the morning milk mainly because the morning milk is sold to cooperatives and chilling plants where men are the registered members and therefore receive the payment, whereas the evening milk is sold by women to neighbors and local traders (EADD, 2009).

Income share across commodities and across time

While acknowledging that the type of commodity influences the income share going to women, other factors may influence the proportion of income going to women. We explored the relationship between income share and total income from that commodity in order to test the hypothesis that women control more income from commodities that generate low incomes and that once commodities start giving higher incomes, men take over. We look at three commodities where women have the lowest income share and another three commodities where women have the highest income share. Figure 4 shows the relationship between mean income from each of the commodities and the income share going to women.

Figure 4 shows a general trend of a rise in income share by women across the low income commodities, which changes with the high income commodities. Although the high income commodities such as potatoes and pigs showed lower income share by women, there were exceptions such as in rice where despite the average income being higher than most of other commodities at %dollar;230 per annum, the income share to women was also relatively high, with 45 per cent of income controlled and managed by women. This may be explained by how the processing and selling of rice is done in Malawi. Women are mainly responsible for the processing of rice (de-husking) before the rice is sold. This is a very labor-intensive exercise involving use of a pestle and mortar to de-husk the rice. The rice is then sold to middle men or at local markets. At the time of collecting the data, an initiative by a government program was underway to improve rice marketing through

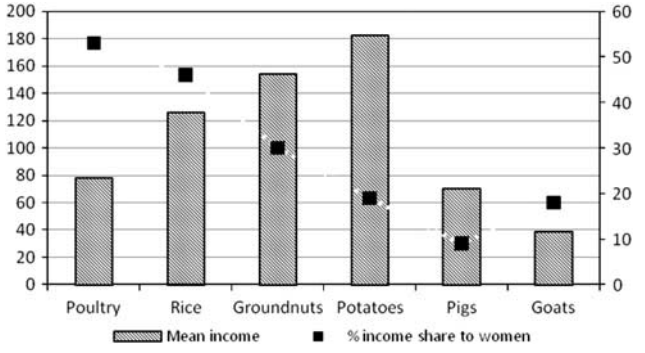

Figure 4: Mean income (USD) from different enterprises and percentage income share going to women.

a farmer association and links to rice mills. The links to mills would open up a market for husked rice eliminating the need for women to manually de-husk the rice. This could, however, lead to the marketing of rice, moving from women's to men's domain. In the lower income categories, groundnuts and poultry had average incomes below $100 per annum and high income shares going to women (43.6 per cent for groundnuts and 52.7 per cent for poultry). The exception in this category was pigs, which had a low average annual income and a low percentage share to women, owing to the pig marketing value chain. Pigs in Malawi were mainly sold to middle men for slaughter and were often transported by men on bicycles to the local and town markets.

We analyzed changes in income share going to women over time using beans in Malawi and Uganda as an example. Before the identification of beans as a crop of economic importance and as a potential agro-enterprise for the village of Chinsewu in Malawi, beans were grown on a very small scale. Farmers used local varieties intercropped with maize mainly for household food consumption often as relish for the main food *nsiima*. Occasionally, women sold surpluses to meet household cash needs for basic items. With commercialization, there was an increase in the amount of beans produced, marketed and the amount of money that households made from beans. Figure 5 shows the income share to women across seasons. The line shows the decline in women's control of income from the crop as total income (bar) increased. Thus, as the beans became more marketable, men tended to get interested and took over.

There was a gradual increase in bean production per household during the period 2003–2007. The system of production also changed from a maize bean intercrop to a bean mono crop, with row planning and use of inputs, including fertilizer. The marketing of beans also started changing, from mainly roadside sales by women to more organized sales in local and city markets, as well as to private companies exporting beans to South Africa. Although no labor data are available on men and women's participation in bean production, a greater male interest and participation in both bean production and marketing was observed.

In contrast to Malawi, in Uganda, the National Agriculture Research Organization was working with farmers to improve bean production, test new varieties and manage bean pests and diseases without a marketing intervention. Changes in production and sales remained fairly constant and so did the income share managed by women, as shown in Figure 6.

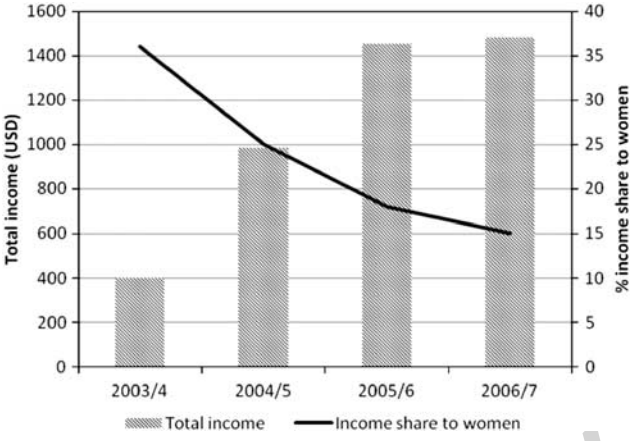

Figure 5: Changes in percentage income share from beans managed by women in Malawi with increase in bean revenues between 2003 and 2007.

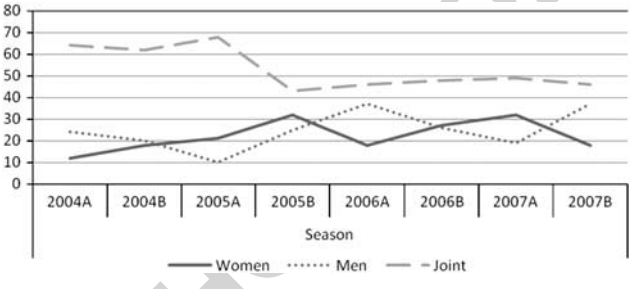

Figure 6: Percentage income share to women from beans in Uganda.

So what determines income share under the control and management of women?

An analysis of factors expected to influence income share including type of market, proportion of the income from the commodity to total household income, education of men and women, market location and who sold the crop/product was carried out (Table 3).

These variables explained about 60 per cent of the variation in income share. In households with older male heads of households, women were more likely to control and manage more money compared with households with younger heads of households. Women were more likely to control income if it came from beans and groundnuts. This confirms the earlier results of high income share from groundnuts and beans compared with soybeans. As expected, if women sold the products, their income share was more likely to be higher compared with when men sold it, or when there was joint sale. The location of markets did not influence women's income share. It was expected that selling at farm gate or in local markets would increase the likelihood of women having a higher income share, as they have more access to such markets compared with district and regional markets.

A major observation is that with no deliberate linkage to organized markets, production does not change much, but linking farmers to markets seems to trigger a production

Table 3: Factors influencing women's income share in Uganda and Malawi

	Unstandardized coefficients		*Standardized coefficients*	*t*	*Sig.*
	B	*SE*	*Beta*		
Constant	−6.763	10.957	—	−0.617	0.538
Enterprise/product					
• Beans	10.108	5.547	0.104	1.822	0.070
• Groundnuts	29.017	7.067	0.226	4.106	0.000
• Soyabeans	1.839	9.762	0.010	0.188	0.851
• Goats	9.721	6.375	0.090	1.525	0.129
• Pigs	0.151	12.159	0.001	0.012	0.990
• Poultry	−4.087	16.986	−0.011	−0.241	0.810
% of enterprise income to total hh income	0.042	0.092	0.022	0.452	0.652
Who sold (1 = Wife 0 = Other)	65.588	4.734	0.685	13.854	0.000
Market sold to (1 = local or farm gate 0 = other)	−4.663	5.740	−0.043	−0.812	0.418
Education of men (0 = None, 1 = Primary and above)	3.673	5.535	0.032	0.664	0.508
Education women (0 = None, 1 = Primary and above)	−5.651	4.571	−0.063	−1.236	0.218
Family size	−1.051	0.782	−0.064	−1.343	0.181
Age of household (years)	0.405	0.163	0.124	2.480	0.014
R^2	0.606	—	—	—	—

increase and an increase in the marketed quantities. The downside to this is that men seem to get interested and women seem to lose control of commodities with good market value.

Control and Management of Income by Men and Women and Expenditure Patterns

Evidence from previous studies indicates that increasing income through agricultural commercialization is a necessary but not sufficient condition for improving household wellbeing, food and nutrition security. Studies suggest that agricultural commercialization may be associated with higher incomes, which may or may not lead to greater expenditure on food (Penders *et al*, 2000). Who manages and controls the income is expected to determine whether or not increased income leads to more expenditure on food. Differences have been observed in the way men and women spend their income shares. For example, Senauer *et al* (1986) found that in Sri Lanka an increase in women's earnings results in higher expenditures on bread than on rice.

We analyzed expenditures on nine different expenditure groups by men and women using the income under their control. The mean values of the expenditure shares for the nine commodities analyzed are given in Table 4. The figures in the table represent percentage of total expenditure on these items from income managed by women, men and jointly.

Looking at different expenditure lines, men spent 6 per cent of their income on food, whereas women spent 23 per cent of their income on food. In addition, only 8 per cent of the jointly managed income was used for food. Twenty-five percent of men's income went to assets compared with 14 per cent of women's income. Assets mainly included livestock, household furniture, mobile phones and home improvement. Women spent a higher

Table 4: Percentage of income managed by husband, wife or jointly spent on different items

Expenditure item	*Husband*	*Wife*	*Joint*
Food	6	23	8
Agricultural production	14	22	25
Assets	25	14	15
Education	20	7	20
Health	5	2	3
Clothing	18	22	5
Social assistance	2	2	8
Leisure	2	1	2
Other	8	7	14
Total	100	100	100

proportion compared with men on agricultural production and clothing for themselves and children.

The priority expenditure for men therefore seems to be assets (25 per cent), education (20 per cent), clothing (18 per cent) and agricultural production (14 per cent). For women, the priority is food (23 per cent), agricultural production and clothing (22 per cent) and assets (14 per cent). These results could be in line with the traditional responsibilities of men and women within households where women are expected to deal with issues of food within the household and men have responsibility for school fees and the purchase of assets.

Results from Cote d'Ivoire show that raising the wife's share of cash income increased food expenditure and reduced the budget shares of alcohol and cigarettes (Hoddinott and Haddad, 1995). In the United Kingdom, it was found that granting child allowances to the mother instead of the father leads to increased share of expenditure on children and women's clothing (Lundberg and Pollak, 1996). Women's involvement in market activities is likely to induce secondary effects on food and nutrition security at the intra-household level (Zeyu, 2007). Further analysis is, however, required to gauge the food sale/expenditure balance, especially when the income is from sale of key food security crops or animal products.

Expenditure on leisure items was fairly low for both men and women, constituting just 2 per cent of men's share of income and 1 per cent of women's share of income. This expenditure would, however, have to be confirmed with observation, as expenditure on leisure activities is often under-reported. A project in India found that cash income led to greater alcoholism, which reduced the amount of income available for family food and used up a proportion of grains for distilling alcohol (Azad, 1996). All in all, it would seem that empowering women through increases in income and greater management and control of the income can lead to more spending on children's and women's consumption and health, relative to spending by men. Jointly managed income was more likely to be spent on agricultural production (25 per cent), education (20 per cent) and assets (15 per cent).

A *t*-test of actual expenditures by men and women was carried out to determine whether the average difference in expenditure across times was significantly different from zero. Table 5 shows results of the paired sample *t*-test. There are significant differences in the amounts spent on food and clothing. Despite the low share of income to women, they spent more in real terms compared with men on food and clothing.

Table 5: Mean differences in expenditure on key items by men and women

	N	*T*	*DF*	*P*
Purchase of food	396	−3.30	395	0.001
Agricultural production	87	−0.01	86	0.989
Purchase of assets	91	0.76	90	0.450
Payment for education and materials	182	1.55	181	0.123
Health	184	1.02	183	0.310
Purchase of clothing	190	−2.11	189	0.036
Social assistance (family, friends, community)	396	−0.81	395	0.416
Leisure activities (alcohol, cigarettes, hair)	182	−0.61	181	0.546

Both men and women were equally likely to spend on other items such as investments in agricultural production, purchase of assets, payment of education, social assistance and leisure activities. There were no significant differences in the expenditure by men and by women on these items.

Conclusions

Increasing commercialization through linking farmers to markets will increase farmers' incomes but with implications for gender and intra-household dynamics. Programs aimed at increasing commercialization or using a value chain approach need to take into account these gender and intra-household dynamics. The choice of commodity matters as shown by the difference in income share from food crops and livestock going to women. Women seem to control more income from crops traditionally used for food such as beans and groundnuts compared with crops such as soybeans. Across different types of commodities, women controlled a higher income share from crops than from livestock. Other factors that determined income share going to women were the type of market, with women managing income if products were sold in local markets, amount of income from a particular commodity, age of the head of household and age of the woman. Women are more likely to control income from commodities that have lower revenues, whereas they controlled a lower share of income from high revenue commodities. The implications of these findings are that gender considerations should be integrated during the value chain or commodity selection. Gender-sensitive value chain or commodity selection involves looking at different commodity options, the relative opportunities for men and women, and the potential constraints and benefits with consideration for the intra-household relations and resource flows. In many marketing activities, women's roles and preferences can be hidden or unclear, especially given that they are likely to participate more in local and informal markets. Without a good understanding of what women's roles and preferences are and why, market development can undermine these roles. Standard approaches of analyzing value chains can often miss the gender and intra-household issues. Gender-sensitive analysis can help to identify the actual and potential roles for women within these market commodities and to develop strategies to benefit men and women without undermining the control of these commodities by either category. There are existing frameworks and approaches that can be used for such analysis, including the Gender Dimensions Framework, the Integrating Gender Issues into Agricultural Value Chains approach and the Gender Equitable Value Chain Action Learning Approach.

Cultural issues affect the relative control of income from crops by women as seen in the differences between Uganda and Malawi. Income share to women from beans is low and relatively constant in Uganda, which is predominantly a patriarchal system. In Malawi, where women are more involved in decision making in matriarchal systems, income control was initially quite high. Market forces, however, influence culture, as shown by the decline in income share as income from beans increased.

From the results of this analysis, as low income commodities start to attract higher prices and revenues through farmer linkages to higher price markets, women tend to lose control of these commodities. An often unplanned result of farmer–market linkages is the weakening of women's control over such commodities. Skills building and using gender transformative approaches can ensure that women do not lose control of these commodities as they enter the market arena. Monitoring and evaluation of value chains and market development programs need to take into account these unexpected outcomes. Indicators for market and value chain projects need to be 'gendered' and go beyond measuring changes in income to focusing on changes in production system, distribution of the income and the use of the income.

Women's income was found to be largely spent on food and just as food security-related projects focus on women, market-related projects need to adopt strategies that ensure women do not lose control of crops and the income from these crops so as to reduce the market-food security trade-offs. Working with both men and women in market development, working on multiple value chains and multiple markets (both formal and informal) and integrating gender training in market development can mitigate against negative intra-household effects from value chain and market development programs.

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