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**Assessing the participation of men and women in cross-border
trade in agriculture: Evidence from selected East African
countries**

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Background

This study was identified as a priority by the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA), which has been given the mandate of linking small-scale agricultural producers in Eastern and Southern Africa to national, regional and international markets. The study arose from the emerging concern that trade liberalization, as related to gender, is neither well understood nor well captured in the region. Yet, a full understanding of the gender dimensions to trade, specifically determining factors of women and men's participation in cross-border trade in agricultural commodities, can significantly change how national and regional interventions should be prioritized under the Comprehensive Africa Agriculture Development Programme (CAADP) framework. The role of small-scale entrepreneurs, both men and women, in intra-regional agricultural trade appears to be important, as they are active agents in and beneficiaries of the development of trade, growth and prosperity in Africa.

Research has shown that cross-border trade in agriculture can be engendered in many ways, especially when the material conditions to take up trade opportunities are examined through a gender lens. These conditions include access to productive resources, type and volume of agricultural commodities traded, infrastructure and means of transportation, trade-specific barriers and other socio-cultural constraints faced by traders. These factors seem to have culminated in a gendered division of roles: women tend to specialize in small-scale and low-profit agricultural and food products, selling mostly on a retail basis in local and border markets and, in contrast, men tend to be heavily involved in the wholesale trade of high-value commodities including food staples in high demand from both local and regional markets. This potential division of roles has gradually led to a situation in which the role of women and small-scale traders, despite being instrumental in cross-border trading activities, is neither clearly recognized nor supported by policy at national and regional levels.

ACTESA and like-minded regional organizations recognize the need to promote gender inclusiveness in the design of policies for linking smallholder agricultural producers to national and regional markets. The Regional Strategic Analysis and Knowledge Support System East and Central Africa (ReSAKSS-ECA) has contributed to this agenda by spearheading a study in selected East African countries, namely Kenya, Tanzania and Uganda, to provide new insights in gender differences that can inform advocacy strategies and policy formulation in support of intra-regional trade development within the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA). Building on existing theoretical and empirical work in sub-Saharan Africa, the study intends to generate new evidence for comparative analysis of men's and women's realities and to further identify gender-related differences that would require careful consideration in the design and implementation of agricultural and trade policies in the region. This paper serves as a baseline document for promoting dialogue and action planning to address decisive gender-related issues in agricultural cross-border trade.

Introduction

In Africa, agricultural cross-border trade (CBT) has expanded since the 1990s as a result of regional integration processes (Yang and Gupta 2007; FAO 2003). Indeed, intra-regional agricultural trade is expected to generate significant economic and social returns for different population groups including women and poor smallholder farmers living in rural areas. These groups constitute a strong driving force in the production, consumption and trading of local agricultural commodities across borders (Tran-Nguyen A-N and Zampetti 2004; Ackello-Ogutu and Echessah 1997). However, socio-economic opportunities associated with trade openness are not always evident for these actors, who continuously face significant challenges in accessing local and regional agricultural markets¹. An important aspect to consider is the persistent gender inequalities associated with trade liberalization in different sectors, including agriculture (Fontana 2009). In recent years, African governments have advocated for trade openness as a strategy to eliminate economic and regulatory barriers to intra-regional trade. This has since translated into various bilateral, multilateral and regional trade agreements to facilitate trade flows within a region or sub-regions. As the agreements and policies put in place favour trade liberalization, social costs associated with their implementation are assessed from different perspectives. Potentially, gender-differentiated effects also need to be considered to increase the visibility of less advantaged groups involved in trading local agricultural commodities.

Many studies have suggested that CBT in agricultural commodities in different African regions could bring substantial benefits to agricultural traders if the current impediments to free trade could be overcome and actions identified to account for gender-specific differences in trade policy formulation. However, conceptual and empirical analyses of *gendered participation*² in agricultural CBT are still sparse. Furthermore, whenever such studies are available, they rarely delve into gender-related issues *per se*, often opting for a women-specific approach, which may not be as effective in guiding policy efforts to support prioritized national and regional trade interventions. The question is therefore the extent to which gender dimensions matter in agricultural CBT. Put differently, there is a need to investigate whether the socio-economic context within which traders operate contributes to exacerbating gender differences in agricultural CBT. The research problem is captured by the following questions: (i) do the socio-economic factors discussed in the literature affect female more adversely than male traders? and (ii) is it possible that key issues such as traders' conditions, capacity and constraints faced in agricultural CBT vary significantly not only among women, but also between men and women involved in trading activities across national frontiers?

¹ Much has been written about the inefficient trade procedures and high trade costs associated with poor infrastructure as important impediments to intra-regional agricultural trade in Africa (World Bank 2012; Gad 2009; Karugia et al. 2009; UNCTAD 2009; Njinkeu et al. 2008).

² Gendered participation as a concept, allows for representation of the most marginalized groups, which in most cases include women and the poor (Akerkar 2001). The concept may also be extended to the youth, the elderly and other population groups.

Using primary data collected at selected border posts in Kenya, Tanzania and Uganda, this paper provides a comparative analysis by gender to examine issues likely to affect the participation of men and women in CBT and to explore whether such issues are actually gender-specific. The rationale is that a more informed understanding of gender patterns can potentially contribute to reshaping the trade policy environment in order to promote equal opportunities for linking disadvantaged agricultural producers to national, intra-regional and international markets. The study approach, while based on a relatively well-balanced sample of traders operating within selected border crossing points in East Africa, uses disaggregated data in which information on both men and women is captured and analysed to show whether gender differences exist.

I. Gender and agricultural CBT: An overview

This section defines agricultural CBT and characterizes the main systems of trade. It also provides a brief overview of the gender and trade links from a theoretical perspective.

I.1. Defining agricultural cross-border trade

Agricultural CBT can be broadly defined as the movement of agricultural commodities between neighbouring countries, specifically border cities or towns (Brenton et al. 2011). One important characteristic is geographical proximity, which can contribute to lowering transportation costs and facilitating traders' access to market information on various agricultural products and related services on either side of the border (World Bank and Asian Development Bank 2007).

In Africa, CBT not only has a pivotal role in promoting local agricultural products but is also instrumental in supporting and enhancing livelihoods of rural communities. In remote regions, agricultural CBT can benefit farmers and local traders in many ways. These benefits range from access to additional markets for agricultural products, job opportunities and income generation and ultimately, to poverty alleviation (Ama et al. 2013; Kivuva and Magara 2012; Wanjiku et al. 2012; Brenton et al. 2011). For women in particular, CBT has been a source of empowerment, encouraging them to envisage creative strategies to strengthen their trading capacity in local and regional agricultural markets (Desai 2009).

Additionally, CBT in agricultural commodities offers substantial opportunities for regional integration by strengthening commercial ties between neighbouring countries. There is ample evidence indicating that agricultural CBT, as recorded by official customs, is relatively important at regional level (Kivuva and Magara 2012; UNECA 2010). However, a large proportion of intra-regional trade is often unrecorded, making it difficult to keep track of agricultural commodities traded across several border posts (Macamo 1999; Minde and Nakhumwa 1998; Ackello-Ogutu and Echessah 1997).

I.2. Forms of trade

Agricultural CBT primarily occurs in two major forms: *formal and informal systems of trade*. Both trading systems contribute to linking agricultural producers and traders with different levels of operation (small, medium and large scale) to national and intra-regional agricultural markets.

1.2.1. Characteristics of formal cross-border trade

Formal CBT refers to agricultural trade flows recorded by the relevant national monitoring and control authorities (UNECA 2010). At the regional level and particularly across EAC countries, the promotion of formal trading systems for agricultural products has called for varied policy pronouncements and trade agreements to reduce exchange controls while facilitating free commodity movement within the East African common market. This has been illustrated by the exemption from customs duties for agricultural commodities originating from EAC member states (EAC Customs Union Protocol, n.d.). Despite this process, performing agricultural transactions across borders still requires additional documentation within the EAC region and also at country level (see Appendix A). Agricultural traders complying with these trade regulations are generally profiled as formal traders. Furthermore, formal agricultural trade is characterized as being mostly carried out by large-scale traders who, in most cases, have significant trading capital, expertise and support systems to easily access the required trade documents (Ogalo 2010).

Nonetheless, the involvement of small-scale traders in formal agricultural CBT is also increasingly recognized and supported due to specific provisions especially for small-scale traders (EAC 2006) and trade facilitation initiatives such as the Simplified Trade Regime (STR). Founded on the principles of a free trade regime, the STR is a simplified procedure that aims to facilitate the access of small-scale traders to the trade documentation necessary to import duty free across the COMESA region (COMESA 2011). Both EAC and COMESA trade provisions constitute considerable efforts to encourage formal trade at the borders. However, many obstacles still exist to the development of formal systems of trade (COMESA 2008; Haggblade et al. 2008). These mainly include the challenging process of implementing and monitoring different trade facilitation measures. For STR implementation, key challenges arose from the limited number of commonly traded products between member countries, value threshold for STR (USD 1000 for COMESA and USD 2000 for EAC countries) and the processing fees charged per transaction (COMESA 2011). Similarly, the most common challenges for regular traders appear to be a lack of awareness combined with poor guidance on the utilization and benefits of trade facilitation provisions (EASSI 2012; Njiwa 2012; Ogalo 2010).

1.2.2. Characteristics of informal cross-border trade

Informal CBT can be defined as agricultural trade flows that are not captured or are wrongly recorded in national accounts statistics (Afrika and Ajumbo 2012; Gor 2012; Ogalo 2010; Titeca 2009). Reasons for this misreporting or non-recording are varied, but are mostly related to recurrent practices of goods misclassification, under-invoicing, non-declaration of country of origin, non-compliance with quality standards and use of unofficial trading routes and procedures at the border points (USAID 2012; Lesser and Moisé-Leeman 2009; Macamo 1999). This type of trade is mostly conducted by unqualified or quasi-professional traders dealing with a diverse, but small stock of merchandise (Minde and Nakhumwa 1998). However, studies have also shown that

actors in informal CBT are not always individual traders or small businesses. For example, wholesalers are also extensively involved in informal trading routes, using different means of transportation (e.g., trucks, vans, motorcycles and bicycles) to transfer their goods across borders (Nkendar 2013; Ogalo 2010; Peberdy 2000).

In recent years, informal CBT has become a critical sector in Africa and particularly across the EAC and COMESA regions. Some estimates suggest that more than 95 percent of the trade activities in Eastern Africa are undertaken through unofficial trading systems (Pavanello 2010). The sector is dynamic with important implications for employment and income generation for male and female traders (Njiwa 2012; COMESA 2008). Estimates also indicate that informal CBT employs about 20 to 75 percent of the labour force in most African countries (UNECA 2010). In addition, studies have documented a positive correlation between informal trade exchanges and improved food security because many food products are made widely available to consumers at a relatively lower price (Little 2007; Ackello-Ogutu and Echessah 1997).

1.3. Gender-cross-border trade linkages: insights from literature

The relationship between gender and intra-regional trade in agricultural commodities can be discussed with regard to the gendered implications of agricultural trade liberalization. Broadly speaking, existing research has examined gender-differentiated impacts of trade openness building mainly on two theoretical perspectives. These approaches are discussed in terms of increase or decrease in gender gaps in the agriculture and rural development sectors.

1.3.1. Positive implications

The trade openness paradigm postulates that trade increases economic growth, brings more exposure to national economies, contributes to improving livelihoods and ultimately, reduces poverty rates in many developing countries (Anderson 2003; Cagatay 2001). In relation to gender, studies have shown that trade openness can contribute to narrowing the gender gap through liberalization policies that promote equal opportunities in trade and related sectors (UNECA 2010; Garcia et al. 2005; Tran-Nguyen and Zampetti 2004; Gammage et al. 2003). Trade openness is supposed to bring more employment opportunities and increased income for the workforce operating in various export-oriented sectors, including agriculture (Randriamaro 2006; Korinek 2005).

In Africa, trade liberalization processes have resulted in various initiatives to linking smallholder farmers to regional markets (UNECA 2010). As a result, women and smallholder farmers have engaged in trading in agricultural commodities using both internal (e.g., employing family members) and external services (e.g., public and private transportation) to contribute to increased food security and improved livelihoods at the individual, household and community levels (Morris and Saul 2000). For the most disadvantaged groups, this has in turn, translated into raising social status, greater empowerment and increased control over relevant resources (Randriamaro 2006; Korinek 2005). Thus, trade openness might directly and positively affect socio-economic situations of women and smallholder farmers operating as net food sellers across

national borders. However, other studies have cautioned that such positive impacts on gender may differ significantly across regions and population groups owing to differences in socio-cultural factors such as age, education, skills and responsibilities (Fontana 2009).

1.3.2. Adverse implications

Some studies have indicated that trade will not necessarily lead to the reduction of existing gender disparities. Trade openness may even exacerbate several gender-based constraints particularly with regard to the capacity of men and women to respond to policy reforms (Garcia et al. 2005). This can be so for various reasons. Trade liberalization, particularly in countries that depend heavily on the agriculture sector, might adversely affect vulnerable social groups. Trade reforms, including tariff reduction associated with changes in the relative prices of agricultural goods, restructuring of market systems and, to some extent, the gradual removal of state support to services specific to agriculture (e.g., rural advisory services, subsidies for agricultural inputs) can generate significant undesirable effects (Randriamaro 2006; Cagatay 2001). These include inefficient allocation of resources between social groups and further marginalization of smallholder agricultural producers who already lack access to adequate resources needed to take up trade opportunities (Randriamaro 2006; UNCTAD 2004). Furthermore, trade liberalization policies might not yield equitable and sustainable outcomes due to persistent gender-based inequalities at different levels and in various domains (e.g., resource ownership, decision-making, access to basic services, etc.). The extent of such inequalities is by and large determined by the prevailing gendered division of roles within societies, but it might also greatly determine the extent to which men and women are vulnerable to trade-related constraints in undertaking business activities and the policies implemented to remove these barriers (Sengupta 2013; Fontana 2009; Garcia et al. 2005; Gammage 2003; Cagatay 2001).

2. Factors determining gendered participation in agricultural CBT

Several factors can directly or indirectly affect the participation of male and female traders. These primarily include men's and women's involvement in trading systems, the influence of socio-economic determinants and potential impact of trade-related barriers.

2.1. Involvement in trading systems

The regional integration process calls for more formal systems of trade. However, there is increasing evidence that a significant proportion of intra-regional trade is carried out informally (UNECA 2010). Women are said to be over-represented in informal CBT, dealing mostly with small batches of agricultural and other commodities (Ama et al. 2013; USAID 2013; Lesser and Moisé-Leeman 2009; Masinjila 2009). The predominance of female traders within informal trading systems is often attributed to their continued exposure to time and mobility constraints (USAID 2012). Other reasons include differences in access to support systems, which often prevent them from complying with legal trade requirements (Ndumbe 2013; Njuki and Mburu 2013; EASSI 2012; Doss et al. 2007). In contrast, a study by Minde and Nakhumwa (1998) found some evidence

in Karonga market (Malawi–Tanzania border) that in terms of formal export trade, men tended to dominate in most commodities, that is, value-added agricultural and non-agricultural commodities, while women only represented a very small proportion (estimated at 4 percent) of the formal traders. In a similar vein, a case study in Rwanda indicated that only 20 to 40 percent of formal traders in the surveyed cross-border points were female entrepreneurs, possibly reflecting a predominance of men in conducting formal cross-border trading activities (USAID 2013).

2.2. Socio-economic determinants

Socio-economic determinants are directly linked to the socio-economic status of traders and may therefore also bring some gender considerations to CBT activities. No exhaustive list of socio-economic factors exists which could affect traders' participation in agricultural trading activities in border areas. Several studies have focused on a few limiting factors to provide a gender analysis of CBT. These mainly consist of financial sources, experience in trade, intensity of trade, household responsibilities, access to information and trading networks and also, gender-based issues in relation to administrative procedures and security at the border.

2.2.1. Sources of finance

Capital is a key factor driving the participation of traders in agricultural CBT. Such trading activities usually require substantial financial resources, which are raised from different sources. It seems that male and female traders often rely on personal savings as their main source of capital (Njiwa 2012; Titeca and Kimanuka 2012; EASSI 2011, 2012; Masinjila 2009; Williams et al. 2006). Other financing sources include loans, micro-credit schemes, revolving saving groups, friends and relatives and, to some extent, self-help groups. A positive correlation appears to exist between the capital at a trader's disposal and the level of engagement in marketing channels (Williams et al. 2006). Findings from a few studies indicate that male traders are more likely to get loans from banks while women tend to rely more on informal sources such as rotation clubs (merry-go-round) and loans from relatives and friends (Njiwa 2012; Desai 2009). Most studies find that inadequate finance serves as a major impediment primarily to women's involvement in CBT. This also appears to be highly correlated with limited access to credit facilities (EASSI 2012; Desai 2009; Masinjila 2009).

2.2.2. Experience in trade

Participation in CBT not only depends on available financial resources but also on experience gained over time (Williams et al. 2006). Trading history can be captured by the number of years of involvement in business activities and is likely to influence several variables, including profit generated by CBT, trading capacity and intensity, and also the behaviour and practices of the trader such as coping strategies to address trade-related challenges. In most studies that consider experience in trade as an important determinant of participation in CBT, gender differences are not clearly captured (Ama et al. 2013; Njiwa 2012; EASSI 2011; Masinjila 2009).

2.2.3. Household responsibilities

Household responsibilities can also determine the extent to which traders may get involved in CBT activities. These responsibilities differ depending on the specific role as household head or spouse (Titeca and Kimanuka 2012) and can also be influenced by the number of dependants. A large number of dependants is often associated with increased responsibilities for traders and vice versa (Njiwa 2012). Analysis of gender patterns in existing research has revealed that women are more likely to support many dependants through their business activities (Njiwa 2012; Desai 2009; Masinjila 2009; Randriamaro 2008). However, the high level of expenditure is often negatively correlated with the reinvestment of capital in CBT and consequently can constitute a limiting factor for participation in trade and business expansion. Studies have shown that women are more likely to spend income generated from trade activities on the household rather than reinvesting profits to expand their business (Ama et al. 2013; Masinjila 2009). Additionally, while women may be instrumental in supporting the livelihoods of many dependants, this does not free them from their daily workload (domestic tasks) within the household, which in turn, may also become a major hurdle for their participation in CBT due to their time constraints (Titeca and Kimanuka 2012).

2.2.4. Trade intensity

With regard to the type of agricultural commodities, the literature has documented gender gaps in the commercialization of crops. Men tend to be more involved in import/export activities of high-value cash crops than women are even though production activities of women often tend to be more diversified (Fontana 2009; UN WOMEN 2009; Garcia et al. 2005). A potential gender gap was also uncovered in the trading capacity and levels of operation in different border markets. Various studies have indicated small volumes of agricultural goods traded by women as they usually operate on a retail basis whereas men are more likely to dominate agricultural wholesale trade (Ama et al. 2013; USAID 2012; Ogalo 2010; Morris and Saul 2000, 2005; Minde and Nakhumwa 1998).

2.2.5. Access to information

Information is a crucial aspect of CBT. Many difficulties experienced by traders result from a lack of awareness about trade agreements/protocols and inadequate information on existing trade opportunities. Even when traders are aware of trade agreements and protocols, specific documentation is not always available and clearing procedures at some border posts are not transparent (UN WOMEN 2009). It seems that cross-border traders, especially women, are neither aware nor informed appropriately about the required trade documentation, customs regulations and existing tariffs where applicable (EASSI 2011 and 2012; UN WOMEN 2009; Masinjila 2009). This limited information on tariff agreements has often led to situations where a trader's ignorance has been used to demand duties on goods (for example agricultural commodities) that no longer require customs duties (EASSI 2011; Ogalo 2010). Similarly, many

women traders have reported a lack of knowledge on the benefits associated with trade facilitation initiatives like the COMESA STR, which in theory allows for importing or exporting small batches without customs duties, but in practice often entail unclear customs procedures (Njiwa 2012).

2.2.6. Access to trading networks

Many traders have opted to form self-help groups or organize themselves in CBT associations to tackle issues such as imperfect and asymmetric information and lack of transparency on the benefits accrued from trade agreements and protocols prevailing at the border points. These institutions aim to provide platforms for meeting other traders, sharing experiences and supporting each other while taking up business activities across borders (Nkendah 2013; Ndumbe 2013; Njiwa 2012; Desai 2009). Most traders are organized informally within self-help groups, but this coordination mechanism tends to be undermined by lack of trust or power relations among traders (Nkendah 2013; Titeca 2009). Existing well-structured associations work towards addressing such issues by acting as liaison bodies between traders and relevant authorities and among traders themselves (Njiwa 2012). Membership in such associations is therefore a critical factor contributing to the participation of traders in CBT. It seems that men tend to easily access business connections through formal trading networks while women's access is limited (Ndumbe 2013). Women would get involved with formal trade associations but mainly for larger-scale trade activities, otherwise they are more inclined to rely on informal networks (friends and relatives) to transact across borders (Desai 2009).

2.2.7. Other important challenges in CBT

Evidence exists that successful participation in CBT is directly linked to conditions experienced by traders in crossing borders (World Bank 2010). These conditions mainly consist of bureaucratic obstacles—particularly cumbersome procedures for obtaining trade documents and various forms of bribery that make it difficult for many traders to participate in CBT (Ndumbe 2013; Brenton et al. 2011; Masinjila 2009)—and security at the border, a potentially gendered issue in CBT. Risky situations and acts of violence are prominent and constitute the daily fate of many traders, a large proportion of whom are women (Brenton et al. 2011; Njikam and Tchouassi 2011; World Bank 2010). Studies analysing gender differences have led to mixed conclusions. Some studies found that women are more likely to face various kinds of abuse (threats, goods retention, physical assault and harassment) and also seem to be more vulnerable to corruption (Brenton et al. 2011; UN WOMEN 2009). Results from other studies found no significant difference between male and female traders with regard to the levels of harassment, physical violence and payment of non-official taxes and levies (Njiwa 2012; Titeca and Kimanuka 2012).

2.3. Missing links in empirical studies

From the empirical literature discussed in sub-sections 2.1 and 2.2, women are primarily and regularly engaged in informal and small-scale trading activities. Female traders tend to be more

vulnerable to trade-related barriers due to a difficult adaptation process partly caused by several socio-economic factors which hamper women's participation in cross-border trade. Although women are likely to have access to fewer trade opportunities due to their economic status and low bargaining power, it is equally important to recognize instances where men are disadvantaged or where some trade-related issues might not be primarily interpreted as gender specific. While research has begun to shed light on critical issues vis-à-vis women in CBT, information gaps remain on the gendered aspects of agricultural CBT because of the singular focus on women while agricultural CBT involves both female and male traders. Studies have analysed data collected only for women with very few male traders included or sometimes omitted in the sample to allow for effective comparative analysis by gender. This paper contributes to the existing empirical literature by analysing whether gender differences are likely to influence a gendered participation in agricultural CBT.

3. Methodology

This section covers different aspects of the study design, including the focus of analysis, data collection, a description of the surveyed cross-border sites and the sampling method. Demographic characteristics of the sampled traders are also summarized in this section.

3.1. Research focus

CBT in agricultural commodities is vibrant and diverse, comprising many different actors and covering various types of activities (Nkendah 2013; Guthiga et al. 2011; Desai 2009; Williams et al. 2006). Some activities are dominated by men or women while others feature an equal representation of both genders in CBT operations. Along the CBT chain in agricultural products, handling is an important activity which includes bulking of agricultural commodities and warehousing operations with men as the main actors. However, other cleaning and packaging activities in small bags exist which are usually carried out by women. A second main activity is transportation which features at every point along the CBT value chain, as goods are sourced locally and in frontier markets. These activities are mostly conducted by men specialized in the food trucking business. Women are, however, not excluded. Although rarely involved in transporting large volumes of agricultural commodities, women seem to play a major role in the transportation of small quantities using small vehicles, bicycles or carts (USAID 2012; Ogalo 2010; Morris and Saul 2000). For most of these activities, actors can be mainly considered as trade facilitators. This analysis focuses, however, on the gender patterns in actual trading activities. Consequently, the target group for the study includes traders who are actively and directly involved in buying and selling agricultural commodities across different border posts. Traders are characterized by the average capital for trading activities and the level of operations in the market. These variables are critical to defining the trader's profile as retailers/wholesalers, medium and large-scale agricultural traders or small-scale itinerant traders (Morris and Saul 2000, 2005). Among the major traders, it is important to distinguish between agricultural traders whose role is often confined to supplying agricultural goods although they may also purchase food products

from other traders; and brokers/trade agents who usually serve as intermediaries to help find quality products, negotiate prices and transfer goods across the borders (Williams et al. 2006). Trading activities can be differentiated according to business size. Analysing from a gender perspective, retail activities primarily involve women who usually buy and sell agricultural products for local consumption on a retail basis. Wholesale/retail activities are carried out by men and women who buy wholesale in order to sell to large retail outlets. Wholesale trade activities are mainly carried out by men with substantial resources to purchase large volumes of agricultural commodities for export, from farms and smallholder producers residing at the border areas (Nkendah 2013; Desai 2009; Morris and Saul 2000, 2005).

3.2. Data collection

The study consisted of a survey which allows for the collection of quantitative cross-section data on various aspects of traders' participation in agricultural CBT. Information was obtained using a structured questionnaire, which was administered to male and female traders individually. Some traders were located permanently at the border posts while others were regularly transiting through the surveyed border towns. The questionnaire captured critical information on dimensions connected to traders' marketing activities at border posts. Questions were asked on the frequency, profile and forms of participation in agricultural trade, type and volume of agricultural products traded, capital requirements, means of transportation across borders, access to information, awareness of trade requirements and provisions, challenges and opportunities in cross-border trading activities as well as demographic characteristics. Quantitative data were supplemented with some qualitative information collected using key informant interviews with customs officials, CBT associations and officers of the Ministry of Agriculture at the border crossing points. These interviews were critical to defining the estimated population of traders required for the sampling procedure. The interviews also helped in seeking clarification on the duties (where still applicable) and specific documentation and processing fees required when crossing borders with staple food commodities.

3.3. Description of the sites

The study was conducted from September to November 2013, in four towns along the Kenya–Uganda (Busia and Malaba) and Kenya–Tanzania (Isebania and Namanga) borders (see Appendix B). Countries in the EAC region trade across several crossing points that vary considerably in terms of their geography, development, administration and intensity of trading activities, factors, which are likely to affect trade activities occurring across and around borders³.

The four border towns were selected based on the relative importance of agricultural trade taking place across them. These consisted of communication facilities, transport links, availability of supporting institutions (e.g., CBT associations) and trade monitors at the selected border towns were also important for selection.

³ Information on the border crossing points is compiled from a report by the Ministry of Agriculture in Kenya (Kivuva and Magara 2012).

3.4. Sampling method

The selection of agricultural CBT traders at the four border crossings was based on a Probability Proportional to Size (PPS) methodology with an expectation to obtain a statistically representative sample of agricultural CBT traders to be surveyed at each selected border post. The PPS sampling technique is often used in sampling situations in which there are significant differences in population size between the sampling units. PPS accounts for these differences by ensuring the same probability of being sampled both in the larger clusters or smaller ones (Hansen and Hurwitz 1943). PPS includes different steps described in McGinn (2004) which have been followed for our study (see Appendix C). The rationale for using this sampling technique was driven by two main issues identified during the key informant interviews.

First, significant differences were apparent across the four borders with regard to trade flows and the number of traders crossing at the border towns. In fact, the number of CBT traders (e.g., day trippers) in Busia could be as high as 300 per day whereas borders like Namanga and Malaba feature approximately 40–50 day trippers on the busiest market days during the peak season (see Appendix D for the estimated population in the different border posts). Second, where available lists of members were provided by CBT associations although some lists were not very consistent with regard to the traders dealing primarily with agricultural commodities at the selected posts.

The target population was 125 traders to be interviewed per border post for a total sample of 500 individual traders dealing with agricultural commodities. However, the final sample size obtained across the 4 borders was 463 traders randomly selected from different markets, stalls and transportation routes. Most traders were located permanently at the border posts, but some also regularly transited through the border towns surveyed. Despite differences from one study site to the other, the study sample remained relatively well distributed with respect to gender and thus, can provide useful insights into the possible gender-differentiated patterns associated with agricultural CBT. The distribution of sampled traders by border post and gender is presented in Table I.

Table I: Distribution of sampled traders by gender

Border post	Men	Women
Busia	98	94
Isebania	35	88
Malaba	32	62
Namanga	26	25
Total	191	272

Source: Field survey data, September-November 2013

3.5. Demographic characteristics of sampled traders

Trader demographics (distribution by gender) show that more than half the traders were Kenyans (57 percent) with a majority of Kenyan female traders. Ugandan traders represented 24.4 percent and traders from Tanzania constituted 18.6 percent of the entire sample with a fairly similar number of male and female respondents.

The traders were also relatively young. Most fell within the age brackets “26-35 years” and “36-45 years” with many women in these age categories. About 22 percent of the sample included traders aged 46 years (mostly women) and above; whereas only a small group of traders (6.7 percent) were below 25 years. A large proportion of traders declared being married (82 percent). Female traders constituted 44.7 percent in this marital regime while this was the case for about 37.4 percent of men.

Most respondents had generally attained or completed primary and/or secondary education: about a third of female traders (33.9 percent) mentioned having primary school education while this was the case for only 17.7 percent of men. For secondary education, the sample was fairly well distributed between male (18.2 percent) and female (17.9 percent) traders. However, very few traders (less than 5 percent of the entire sample) had attended college/university. On household responsibilities, more than half the traders were supporting up to five dependants; most of these were women. About a third, with an equal distribution between men (15.8 percent) and women (16.2 percent) declared having 6 to 10 relatives dependent on them for their livelihood.

4. Data analysis

The study specific objectives were to analyse: (i) whether the use of trading channels in agricultural CBT is gender-specific; (ii) whether socio-economic factors can potentially contribute to increasing gender differences in agricultural CBT; and ultimately (iii) whether vulnerability to trade-related constraints is positively correlated with gender (being a female trader).

To test the first hypothesis, two questions were used to capture the forms of trade in which men and women were regularly involved. The second hypothesis was tested using the main socio-economic variables discussed in the literature. Traders were asked about their primary sources of capital for trade, household responsibilities (number of dependants), experience in trading across the borders and quantities of agricultural products sold and bought recently (over the last three months). We tested the third hypothesis with variables constructed from different questions on the difficulties traders experienced in getting reliable information, obtaining a loan or accessing trading networks. These constraints also included lack of awareness about trade regulations/provisions, exposure to corruption and various acts of violence faced by traders crossing the borders. The variables of interest are defined in Table 2.

Table 2: Definition of variables

Participation in forms of trade	<i>Use of trading systems</i> was captured by two dummy variables (Yes=1; No=0): <ul style="list-style-type: none"> ▪ Recording of agricultural goods with customs authorities ▪ Payment of additional fees or levies
Socio-economic factors	<i>Sources of finance</i> were captured by three dummy variables (Yes=1; No=0): <ul style="list-style-type: none"> ▪ Use of personal savings ▪ Use of lending sources ▪ Use of other financing sources (e.g., rotation clubs)
	<i>Trading history</i> described the number of years of performing agricultural CBT activities
	<i>Volume of trade (kg)</i> was captured by: Total volume in kg (bought or sold) of main agricultural commodities Volume in kg of each group of agricultural commodities (cereals, pulses and tubers) bought and/or sold across the borders
	<i>Household responsibilities</i> were captured by the number of dependants per trader
Trade-related constraints	Dummy variables (Yes=1; No=0) <ul style="list-style-type: none"> ▪ <i>Limited access to credit</i> (lack of collateral, high interest rates, etc.) ▪ <i>Information constraints</i> (availability, unreliability, time-consuming and costly processes) ▪ <i>Awareness of trade regulations and provisions</i> (trade license, certificate of origin, simplified trade regime, EAC customs union) ▪ <i>Access to trading networks</i> ▪ <i>Exposed to corruption</i> (pay a bribe) ▪ <i>Exposed to acts of violence</i> (e.g., stigmatization, harassment, retention of goods, etc.)

Source: Derived from survey questionnaire, September–November 2013

The first step in the data analysis was based on inferential statistics used to test whether observed differences between male and female traders, calculated from descriptive statistics, were consistent with what would be expected from random fluctuation. To compare gender patterns in the choice of trading systems, trade barriers and sources of finance (categorical variables), cross-tabulation analysis with a chi-square test was performed to see whether the relationship between gender and the selected variables was statistically significant. To explore gender patterns for the continuous variables (trading history, volumes of agricultural commodities traded and number of dependants), independent samples t-tests were computed to compare the means of the variables for the two independent groups of men and women.

The second step in the data analysis was based on bivariate probit regression. Because buying and selling activities can be dependent on each other, a bivariate probit analysis was used to estimate the probability of traders to participate in agricultural CBT as buyer and as seller and eventually investigate whether gender considerations could play an important part when such a joint decision is made. The bivariate regression model assumes correlated disturbances, that is, correlation between the “independent identically distributed” error terms (Greene 2003, Maddala 1983). We consider a two-equation model in which dependent variables are defined as buying (*BUYER*) and selling (*SELLER*) agricultural commodities where:

$BUYER=1$ if the respondent has been buying across the borders, $BUYER=0$ otherwise
 $SELLER=1$ if the respondent has been selling across the border, $SELLER=0$ otherwise

Following Greene (2003), the specification for the two-equation model can be given as:

$$\begin{aligned} y_{i1}^* &= x_{i1}\beta_1 + \varepsilon_{i1}, y_{i1} = 1 \text{ if } y_{i1}^* > 0, 0 \text{ otherwise} \\ y_{i2}^* &= x_{i2}\beta_2 + \varepsilon_{i2}, y_{i2} = 1 \text{ if } y_{i2}^* > 0, 0 \text{ otherwise} \\ E(\varepsilon_{i1}) &= E(\varepsilon_{i2}) = 0 \\ Var(\varepsilon_{i1}) &= Var(\varepsilon_{i2}) = 1 \\ Cov(\varepsilon_{i1}, \varepsilon_{i2}) &= \rho \end{aligned}$$

Where y_{i1} and y_{i2} represent the buying and selling decisions for a trader i .

The bivariate probit model is derived from the unobservable latent variables y_{i1}^* and y_{i2}^* ; x_1 and x_2 are regressor vectors, the two sets of explanatory variables influencing the probability to buy and sell agricultural commodities for a trader i . β_1 and β_2 are parameter vectors to be estimated.

The joint distribution of errors ε_1 and ε_2 is bivariate normal with ρ (correlation coefficient between the errors of the two binary outcomes). If the correlation turns out insignificant ($\rho = 0$), the estimation of two separate probit models is more appropriate. If $\rho \neq 0$, it is assumed that random disturbances are affected in the same direction and the two decisions are not statistically independent, hence the use of bivariate probit analysis.

The descriptive values for the dependent variables ($BUYER$ and $SELLER$) show a high proportion of traders buying (42.9 percent) and selling (32.1 percent) exclusively across the borders. The traders involved as buyer and seller of agricultural commodities represented 21.6 percent of the total sample. Tabulations with the variable *gender* show that most women fell under the category $BUYER$ (67.2 percent of this sub-sample are female traders). In the $SELLER$ only category, the sub-sample was fairly well distributed between men (53.7 percent) and women (46.3 percent). This was also the case for the sub-sample of traders who were both buying and selling across the border posts where men and women represent 49 and 51 percent respectively.

The explanatory variables in the bivariate probit model included several variables described in Table 2 and additional control variables derived from the survey questionnaire. From Table 2, the following variables are considered:

- The three dummy variables describing the main sources of finance (*use of personal savings, use of lending sources and use of other sources*);
- The continuous variable (*Trading history*) describing the number of years of performing agricultural trading activities across the borders; and
- Five dummy variables describing trade-related constraints (*awareness of trade regulations/provisions, information constraints, access to trading networks, exposed to corruption and exposed to acts of violence*).

Other variables (such as limited access to credit and volume of agricultural trade) in Table 2 were dropped from the bivariate probit analysis due to the high correlation with covariates. Table 3 shows additional variables included in the model: a dummy variable on the trader profile (as retailer or wholesaler) used as a proxy to capture the intensity of agricultural trade and a dummy variable on gender (female or male trader) to capture the possible gender effects with other covariates. Table 3 displays the descriptive values for the explanatory variables.

Table 3: Descriptive statistics of the variables used in the bivariate probit regression

Explanatory variables (N=463)	Mean	Min	Max
Gender (<i>being a female trader</i>)	0.58	0	1
Use of personal savings (<i>Yes=1</i>)	0.68	0	1
Use of lending sources (<i>Yes=1</i>)	0.43	0	1
Use of other financing sources (<i>Yes=1</i>)	0.25	0	1
Trader profile (<i>being a wholesaler, Yes=1</i>)	0.46	0	1
Trading history (<i>years</i>)	9.34	1	40
Information constraints (<i>Yes= 1</i>)	0.92	0	1
Awareness of trade regulations (<i>Yes= 1</i>)	0.43	0	1
Access to trading networks (<i>Yes= 1</i>)	0.26	0	1
Exposed to corruption (<i>Yes= 1</i>)	0.35	0	1
Exposed to various acts of violence (<i>Yes= 1</i>)	0.43	0	1

Source: Derived from survey questionnaire, September–November 2013

5. Analysis results

5.1. Results – inferential statistical analysis

The cross-tabulation analysis provided the following results on the gender patterns in trading systems, sources of trading capital and trade-related barriers (see Table 4):

Gender patterns in the choice of trading systems: The data confirm the predominance of informal CBT in agricultural commodities for the borders surveyed. Most traders were using informal channels for their trading activities (90.3 percent in total with 34.4 percent of men and 55.9 percent women); as they declared not recording their goods with customs authorities. Given that very few respondents declared agricultural commodities traded with customs (9.7 percent), the analysis of gender patterns in use of trading systems focused specifically on informal CBT. With regard to gender differences, the results did not reveal a significant difference between male and female traders. This suggests that gendered roles remain unclear when it comes to trading informally. This contradicts the general assumption that women are more likely to operate in informal trading systems while men are more inclined to use formal systems to trade. The motivation to use informal trade channels does not therefore seem to be directly linked to gender, but to a series of factors that need to be investigated (Afrika and Ajumbo 2012). For example, many traders can choose to trade informally to avoid time consuming, rigid and bureaucratic procedures that often lead to increased costs and thus act as a severe disincentive to operating within formal trading systems (Nkendah 2013). What is more, even when trading activities are formally recorded, methods for checking and recording agricultural commodities

for clearance are just as informal since commodities are often subject to fraud, infringement of national trade regulations and non-transparent regulatory requirements (UNECA 2010).

Gender patterns in sources of trading capital: For the three variables tested, results indicate a statistically significant difference between male and female traders. It appears that women use their own savings and lending sources for trading more than men. This result is contrary to that of other studies that did not find a significant difference between men and women in terms of generating trading capital from household resources and bank loans (Titeca and Kimanuka 2012). The result can probably be explained by the fact that women are becoming progressively economically active with increased incomes resulting from trading activities. This allows them to reinvest their profits while also acquiring loans from financial institutions. The most significant effect for the sources of trading capital was, however, captured by other financing sources such as rotation clubs, which are mostly used by women to acquire capital for trading and also by various development projects. The result is in line with that of other empirical research which found that women are more comfortable borrowing from revolving saving groups (e.g., merry-go-round) for their trading activities (EASSI 2012; Njiwa 2012; Desai 2009).

Gender patterns in trade-related barriers: With regard to major constraints hindering trade business expansion, the analysis revealed significant differences between male and female traders for only two variables. These variables are *Awareness of trade regulations and agreements* and *Access to trading networks*. The results suggest that women tend to be better informed about existing legal requirements and provisions for CBT. This is inconsistent with previous studies in which, generally, limited awareness of trade regulations/protocols specifically among female traders was found and attributed to factors such as low levels of education and heavy reliance on middlemen (EASSI 2011; UN WOMEN 2009). This result could be interpreted in line with the number of female traders who answered Yes to the question on awareness of trade regulations/provisions. However, caution should be observed when considering the effective level of awareness that female traders in this study may have had on the EAC Customs Unions and COMESA protocols. In fact, knowing broadly about trade regulations/protocols and having detailed knowledge on the same are two different perspectives, which may greatly vary among surveyed traders. The statistical significance of the variable on access to trading networks is surprising, given the observed differences between the two independent groups. The result does not imply poor representation of men in trading networks, but can be interpreted in relation to the high level of involvement of female traders mainly in women-specific organizations operating at the border crossings. The non-statistical significance of other trade challenges implies that both men and women can be vulnerable to similar trade barriers affecting their productivity, business expansion and physical integrity.

Table 4: Results from cross-tabulation analysis

Variable (dummies)	Groups	Frequency (Answer: YES)	Chi ²	P
<i>Operations in CBT(Informal trading systems) – N= 418</i>	Men	159	1.04	0.306
	Women	259		
Main sources of trading capital				
<i>Use of personal savings N= 316</i>	Men	139	3.07	0.080 (*)
	Women	177		
<i>Use of lending sources N= 203</i>	Men	93	3.10	0.078 (*)
	Women	110		
<i>Use of other financing sources N= 118</i>	Men	13	59.73	0.000 (***)
	Women	105		
Trade-related constraints				
<i>Limited access to credit N= 207</i>	Men	91	1.13	0.287
	Women	116		
<i>Information constraints N= 169</i>	Men	68	0.11	0.736
	Women	101		
<i>Awareness of trade regulations/provisions N= 202</i>	Men	99	8.89	0.003 (***)
	Women	103		
<i>Access to trading networks N= 122</i>	Men	60	4.29	0.038 (**)
	Women	62		
<i>Exposed to corruption N= 272</i>	Men	60	2.04	0.152
	Women	103		
<i>Exposed to acts of violence N= 200</i>	Men	75	2.04	0.153
	Women	125		

Source: Authors' computation

Note: P value expressed the degree of significance of the statistical test.

Difference is statistically significant if ***= P< 0.01; **= P< 0.05; *= P< 0.1

The comparison analysis of means provided the following results on the gender patterns in trading history, household responsibilities and intensity of agricultural trade (see Table 5):

Gender patterns in trading history: The statistical analysis showed a significant difference between the mean number of years in CBT by men and women. In general, men tend to have more experience in practising cross-border trading activities than women. We believe that this arises from time-related and mobility constraints which often place women at a greater disadvantage (USAID 2012; Gammage et al. 2003). While women are becoming increasingly involved in trading activities, the influence of social realities can partly explain why they could be less experienced than male traders. In fact, the burden of household chores together with the reality of women's reproductive role are factors that could contribute to reduced mobility and increased risk of inability to spend more time on their business and consequently poor access to markets and business connections and strategies (Ndumbe 2013).

Gender patterns in household responsibilities: For the number of dependants per trader, the analysis showed a statistically significant difference between the two independent groups. Male traders were more likely to take on responsibilities within their families, particularly in terms of providing for many people (Table 5). The opposite effect was highlighted in previous studies where the role of female traders appeared dominant in supporting livelihoods of many people

(Njiwa 2012; Desai 2009; Masinjila 2009; Randriamaro 2008). The result from the statistical analysis is, however, unsurprising because in many instances men are viewed as household heads with ultimate responsibility for the entire family in different African regions. This result also suggests that increased responsibilities for traders at the household level are probably not simply a “men or women” issue. These responsibilities need to be looked at from the perspective of specific roles played within the household and how effectively this might influence participation in trade and income generated from trading activities.

Table 5: Results from the comparison of means (selected variables)

Variable	Groups	N	Mean	T-test	P
Total volume (kg) traded across the borders					
<i>Volume bought (kg)</i> N= 299	Men	98	921,951.4	4.64	0.001 (***)
	Women	201	120,461.8		
<i>Volume sold (kg)</i> N= 251	Men	135	1,451,402.0	3.73	0.000 (***)
	Women	116	101,495.4		
Volume (kg) per group of agricultural commodities					
<i>Cereals bought</i> N= 240	Men	82	782,291	4.46	0.001 (***)
	Women	158	83,804		
<i>Cereals sold</i> N= 214	Men	122	868,658	3.64	0.002 (***)
	Women	92	78,148		
<i>Pulses bought</i> N= 160	Men	57	287,137	2.05	0.020 (**)
	Women	103	96,874		
<i>Pulses sold</i> N= 157	Men	97	841,444	1.95	0.026 (**)
	Women	60	63,277		
<i>Tubers bought</i> N= 66	Men	21	392,038	3.23	0.001 (***)
	Women	45	18,392		
<i>Tubers sold</i> N= 42	Men	20	376,062	2.23	0.015 (**)
	Women	22	34,203		
Other continuous variables					
<i>Trading history</i> N= 454	Men	188	10.5	3.01	0.001 (***)
	Women	266	8.4		
<i>Number of dependants</i> N= 459	Men	189	7	4.05	0.001 (***)
	Women	270	5		

Source: Authors' computation

Note: P value expressed the degree of significance of the statistical test. Difference is statistically significant if

***= P < 0.01; **= P < 0.05; *= P < 0.1

Gender patterns in the intensity of agricultural trade: For the group of variables of the trade intensity in agricultural products, we first tested the total volumes (bought and sold) of main agricultural commodities traded. Both results suggested a statistically significant difference between the average volume bought/sold by male and female traders (Table 5). It appears that men were more likely to trade in larger volumes than women. To further investigate the possibility of male- or female-intensive crops, we tested the variables describing main groups of agricultural commodities mainly traded at the surveyed borders, that is, cereals, pulses and tubers. For the three categories bought and sold, the analysis showed a similar significant difference between the average volumes bought and sold by male and female traders. Again, men were more inclined to participate in large-scale trading activities even for specific categories of foodstuffs.

From the survey, it came out that gains from trading activities appear to be larger for men than for female traders based on their respective levels of operation (large and small scale) within the markets. This result matches existing research that suggested potential gender differences in trade intensity of agricultural crops (Fontana 2009). Specifically, it is documented that while many of the agricultural crops mentioned are often traditionally produced by women, increased commercialization by men might be partly attributed to processes and structures that tend to benefit medium and large agricultural traders, among which is a high percentage of men (Randriamaro 2006; Cagatay 2001).

5.2. Results – Bivariate probit analysis

Table 6 presents the results of the bivariate probit regression explaining the probability of men and women to participate in agricultural CBT as seller and as buyer. In the model, the estimate of ρ (rho) that maximizes the bivariate probit function is statistically significantly different from zero, implying that the decisions of buying and selling are not statistically independent. This makes it appropriate to use the bivariate probit model. The parameter 'rho' is, however, significantly negative meaning that some unobserved factors may decrease both the probability of buying and selling agricultural commodities across the borders. This leads to an underestimation of the impact of being a BUYER on being a SELLER. The sample value of the likelihood ratio is -458.18 and is statistically significant at the 1% level implying that the explanatory variables taken together in the model influence the decisions to participate in agricultural CBT.

Table 6: Regression results for buying and selling across the borders		
Explanatory variables	Bivariate probit regression - Coefficients (std. r.)	
	BUYER or not	SELLER or not
Gender	0.445 (0.147)***	-0.498 (0.147)***
Use of personal savings	0.009 (0.155)	0.171 (0.153)
Use of lending sources	0.064 (0.148)	0.101 (0.145)
Use of other financing sources	0.379 (0.174)**	0.065 (0.161)
Profile (<i>being a wholesaler</i>)	-0.399 (0.149)***	0.516 (0.146)***
Trading history (years)	0.010 (0.009)	-0.023 (0.009)**
Access to market information	0.657 (0.255)**	-0.636 (0.252)**
Awareness of trade regulations	0.080 (0.152)***	0.439 (0.150)
Access to trading networks	0.421 (0.138)	-0.082 (0.136)***
Exposed to corruption	0.078 (0.146)	-0.220 (0.141)***
Exposed to various acts of violence	0.0008 (0.154)	-0.459 (0.149)
Constant	-0.740 (0.314)**	0.954 (0.308)***
Observations	454	
Wald chi ² (22)	108.94	
Prob > chi ²	0.000	
Source: Authors computation		
t statistics in parentheses		
*** = P < 0.01; ** = P < 0.05; * = P < 0.1		

The results show that *being a female* trader increases the probability of buying while it decreases the probability of selling across the borders. Women therefore tend to be more involved as

buyers in agricultural CBT. *Being a wholesaler* increases the probability of trade participation as seller. These two results can be related and interpreted as potential gender differences in agricultural trade intensity with levels of operation (large-scale trading activities) being more associated with men. The fact that most women are buyers could also explain their main role as retailers at the border posts surveyed. Regarding the *sources of capital*, only one variable (other sources of finance) was significantly and positively correlated (at the 5% level) with the trade participation as buyer; category with the highest number of women in this study. This implies that women more than men tended to use other financing sources to participate in trading activities as buyers. On the *trading history*, the results revealed that the more experienced the traders, the less they may want to participate in agricultural CBT as sellers. This result is somewhat surprising as one would expect that experience in trade to be positively correlated with both probabilities of buying and selling across the borders. One reason could be that other factors such as age and frequency of trading activities could influence traders' adaptability and resilience to potential barriers affecting selling activities.

As for the variable on *access to market information*, the results suggest a positive correlation with the probability of being a buyer while a negative correlation is established with the participation as seller. Results also show that *awareness of trade regulations* is likely to increase the probability of participating as a buyer. Looking at these findings from a gender perspective, the interpretation could be related to the previous results (inferential statistics) and suggests that women would probably prefer being buyers and not be engaged in selling activities because they tend to be better informed about existing legal requirements and provisions for CBT. But again, it will be critical to distinguish between having broad and detailed knowledge about trade regulations/protocols which may vary considerably among surveyed traders.

The variable on *access to trading networks* increases the probability of selling across the borders. This implies that the more connected with business networks, the higher the traders' involvement in selling activities. On other trade barriers, the variable on the *exposure to corruption* (pay a bribe) is statistically significant, but negatively correlated with the probability of being a seller as expected. However, this result is probably not directly linked to the potential gender issues in trade (given the distribution of men and women among sellers; buyer and seller categories), but can confirm the fact that issues of corruption, harassment and other forms of violence are probably shared concerns for both men and women involved in CBT activities.

Conclusions and recommendations

This paper has provided an alternative analysis of gender patterns in agricultural CBT using primary sex-disaggregated data collected from selected border crossings in East Africa. Key findings from the inferential and bivariate probit analyses can be summarized as follows:

The potential gendered division of roles with regard to the choice of trading channels remains unclear. Men and women traders seem to equally participate more in informal trading systems than formal ones. Some variables (trade intensity, sources of capital, access to trading networks

and market information, awareness of trade regulations) have revealed potential gender differences that can significantly affect the participation of men and women in agricultural CBT.

Vulnerability to trade-related barriers is not specifically positively correlated with being a female trader. The findings showed that men can also face important constraints when trading across the borders. From the analyses, it appears that more remains to be done to ensure that male and female traders benefit equally from the economic opportunities while also minimizing risks associated with their involvement in cross-border trading activities.

The findings also suggest the need to go beyond a dual categorization of traders between formal and informal trading systems. The study has shown that levels of operation in markets combined with a wide range of factors are more likely to bring about gender-specific effects. Policy measures should therefore contribute towards providing a more enabling environment to improve the business climate for all traders at the border crossing points.

Trade protocols include provisions for mainstreaming gender considerations in trade and recognize the needs of vulnerable groups, women and small-scale producers. Our study has shown that although more female traders seem to have heard of existing trade provisions, effective level of awareness and use by traders is still unclear. There is need to strengthen cross-border stakeholder forums and detailed knowledge surrounding the facilitation of trading processes.

Finally, the study should be expanded to account for gender-specific effects with more than categorical variables, including, for instance, continuous variables such as volume and value of agricultural trade, monthly average earnings per trader and total costs of agricultural CBT. An expansion of the study to other border posts could also be useful as gender-specific determinants may vary considerably across the regions. A gender analysis of the regional differences may also be useful to inform trade facilitation policies that can foster direct and indirect benefits for male and female traders as they grow their businesses in one context or the other.

References

- Ackello-Ogotu C and Echessah P. 1997. *Unrecorded cross-border trade between Kenya and Uganda: Implications for food security*. SD Publication Series Technical Paper 59. USAID (United States Agency for International Development) Office of Sustainable Development, Washington, DC.
- Afrika JG and Ajumbo G. 2012. Informal cross-border trade in Africa: Implications and policy recommendations. *Africa Economic Brief* 3(10). Tunis: AfDB (African Development Bank).
- Akerkar S. 2001. *Gender and participation—Overview Report*, BRIDGE Development—Gender. IDS (Institute of Development Studies), University of Sussex, Brighton, UK.
- Ama N.O., Mangadi K.T., Okurut, F. N. and Ama H. A. 2013. Profitability of the informal cross-border trade: A case study of four selected borders of Botswana. *African Journal of Business Management* 7(40):4221–4232.
- Anderson K. 2003. *Agriculture, trade reform and poverty reduction: implications for sub-Saharan Africa*. UNCTAD Policy Issues in International Trade and Commodity Study Series 22. Geneva, Switzerland: UNCTAD (United Nations Conference on Trade and Development).
- Barka H. B. 2012. Border posts, checkpoints, and intra-African trade: Challenges and solutions. Abidjan, Côte d'Ivoire: AfDB (African Development Bank).
- Brenton P., Bashinge C., Hossein C., Shiho N. and Ntagoma J-B. 2011. *Facilitating cross-border trade between the DRC and neighbors in the Great Lakes Region of Africa: Improving conditions for poor traders*. Report 62992-AFR. Washington, DC: The World Bank.
- Cagatay N. 2001. *Trade, gender and poverty*. New York: UNDP (United Nations Development Programme).

- COMESA (Common Market for Eastern and Southern Africa). 2008. *Trade in food staples: promoting price stability and food security through intra-regional trade*. Food Security Collaborative Policy Briefs, Department of Agricultural, Food and Resource Economics, Michigan State University.
- COMESA (Common Market for Eastern and Southern Africa). 2011. Making the CBT sustainable. *Cross-Border Trade Bulletin* 3. Quarterly magazine from REFORM.
- Desai M. 2009. Women cross-border traders in Africa: Rethinking global trade. *Development* 52(3):377–386.
- Doss C, Grown C and Deere C.D. 2007. *Gender and asset ownership: A guide to collecting individual level data*. Policy Research Working Paper 4704. Washington, DC: The World Bank.
- EAC (East African Community). Undated. Protocol on the establishment of the East African Community Common Market.
- EAC (East African Community). 2006. *Women and cross-border trade in East Africa: Opportunities and challenges for small scale women traders*. Friedrich Ebert Stiftung and Collaborative Centre for Gender and Development.
- EASSI (Eastern African Sub-regional Support Initiative for the Advancement of Women). 2011. Mapping of women engaged in cross-border trade in the East African Community. Volume I, Trade Mark East Africa.
- EASSI (Eastern African Sub-regional Support Initiative for the Advancement of Women). 2012. *Women informal cross-border traders: opportunities and challenges in the East African Community*. An Action Research, Trade Mark East Africa, Kampala, Uganda.
- FAO (Food and Agriculture Organization). 2003. *Trade reforms and food security—Conceptualizing the linkages. Commodity Policy and Projections Service*. Rome, Italy: FAO.
- Fontana M. 2009. *The gender effects of trade liberalization in developing countries: A review of the literature*. In: Bussolo M and de Hoyos RE (eds), *Gender aspects of the trade and poverty nexus: A macro-micro approach*. Washington, DC: World Bank.
- Gad M. 2009. A better future for Africa: recommendations from the private sector. Paper prepared for the Africa Commission. Confederation of Danish Industry, Copenhagen, Denmark.
- Gammage S, Jorgensen H, McGill E and White M. 2003. Framework for trade Impact review. Women’s Edge Coalition, Washington, DC, USA.
- García Z, Nyberg J and Saadat S. 2005. Impact of agricultural trade on gender equity and rural women’s position in developing countries. Rome, Italy: FAO.
- Gor O. S. 2012. An assessment of the informal sector trade in Kenya. *The Estey Centre Journal of International Law and Trade Policy* 13(1):102–114.
- Guthiga P, Wambugu S, Ogada M, Massawe S, Karugia J, Oehmke J and Katjiuongua H. 2011. An assessment of the impact of cross-border trade in maize on welfare in the East African Region. Technical Report submitted to USAID (United States Agency for International Development).
- Greene W. H. 2003. *Econometric Analysis*, 5th ed. Upper Saddle River, NJ: Prentice Hall.
- Hagglblade S, Govereh J, Nielson H, Tschirley D and Dorosh P. 2008. Regional trade in food staples: Prospects for stimulating agricultural growth and moderating short-term food security crises in Eastern and Southern Africa. Paper prepared for The World Bank.
- Hansen MH, Hurwitz WN. 1943. On the theory of sampling from finite populations. *The Annals of Mathematical Statistics* 14(4):333–362.
- Karugia J, Wanjiku J, Nzuma J, Gbegbelegbe S, Macharia E, Massawe S, Freeman A, Waithaka M and Kaitibie S. 2009. The impact of non-tariff barriers on maize and beef trade in East Africa. ReSAKSS Working Paper 29. ReSAKSS (Regional Strategic Analysis and Knowledge Support System), Nairobi, Kenya.
- Kivuva A and Magara Z. 2012. *Agricultural cross-border trade between Kenya, Uganda and Tanzania*. Market development Division of Agribusiness, Market Development Directorate, Ministry of Agriculture, Nairobi, Kenya.
- Korinek J. 2005. *Trade and gender: issues and interactions*. OECD Trade Policy Working Paper 24. OECD (Organisation of Economic Co-operation and Development), Paris, France.
- Lesser C and Moise-Leeman E. 2009. Informal cross-border trade and trade facilitation reform in sub-Saharan Africa. OECD Trade Policy Working Papers 86. Paris: OECD (Organisation of Economic Co-operation and Development).
- Little P. 2007. Unofficial cross-border trade in Eastern Africa. Paper presented at the FAO workshop on “Staple food trade and market policy options for promoting development in Eastern and Southern Africa”. Rome: FAO.
- Macamo J. L. 1999. Estimates of unrecorded cross-border trade between Mozambique and her neighbors. SD Publication Series Technical Paper 88. Washington, DC: USAID Office of Sustainable Development, Bureau for Africa.

- Maddala G. S. 1983. *Limited Dependent and Qualitative Variables in Econometrics*. New York: Cambridge University Press.
- Masinjila M. 2009. Gender dimensions of cross-border trade in the East African Community—Kenya/Uganda, Rwanda/Burundi border. African Trade Policy Centre. Addis Ababa, Ethiopia: UNECA (United Nations Economic Commission for Africa).
- McGinn T. 2004. Instructions for probability proportional to size sampling technique. RHRC Consortium Monitoring and Evaluation Toolkit, Heilbronn Department of Population and Family Health, Mailman School of Public Health, Columbia University.
- Minde I and Nakhumwa T. 1998. Unrecorded cross-border trade between Malawi and neighboring countries. SD Publication Series Technical Paper 90. Washington DC: USAID Office of Sustainable Development.
- Morris G, Saul M. 2000. Women's business links: A preliminary assessment of women's cross-border trade in West Africa. A WIDTECH Project Report. Development Alternatives, Inc., Bethesda, Maryland, USA.
- Morris G, Saul M. 2005. Women cross-border traders in West Africa. In: Boko S, Balamoune-Lutz M and Kimuna S (eds), *Women in African development: The challenges of globalization and liberalization in the 21st century*. Africa World Press, Trenton, New Jersey, USA.
- Ndumbe N. L. 2013. Unshackling women traders: Cross-border trade of Eru from Cameroon to Nigeria. Africa Trade Policy Notes 38. Washington, DC: World Bank.
- Njikam O and Tchouassi G. 2011. Women in informal cross-border trade: Empirical evidence from Cameroon. *International Journal of Economics and Finance* 3(3).
- Njiwa D. 2012. Informal cross-border trade: Challenges and opportunities: A case of COMESA and its STR implementing borders.
- Njinkeu D, Wilson J and PowoFosso B. 2008. Expanding trade within Africa: the impact of trade facilitation. World Bank Policy Research Working Paper 4790. Washington, DC: World Bank.
- Njuki J and Mburu S. 2013. Gender and ownership of livestock assets. In: Njuki J and Sanginga PC (eds), *Women, livestock ownership and markets: bridging the gender gap in Eastern and Southern Africa*. IDRC (International Development Research Centre), Ottawa, Canada, and ILRI (International Livestock Research Institute), Nairobi, Kenya, EARTHSCAN from Routledge.
- Nkendah R. 2013. Estimating the informal cross-border trade of agricultural and horticultural commodities between Cameroon and its CEMAC neighbours. *Food Policy* 41:133–144.
- Ogalo V. 2010. Informal cross-border trade in EAC: Implications for regional integration and development. Research paper, CUTS African Resource Centre, Nairobi, Kenya.
- Pavanello S. 2010. Working across borders—Harnessing the potential of cross-border activities to improve livelihood security in the Horn of Africa drylands. HPG Policy Brief 41. ODI (Overseas Development Institute), London, UK.
- Peberdy SA. 2000. Border crossings: small entrepreneurs and cross border trade between South Africa and Mozambique. *Journal of Economic and Social Geography* 91(4):361–378.
- Randriamaro Z. 2006. *Gender and trade: overview report*. BRIDGE–IDS, Gender and Trade Cutting Edge Pack, Brighton, United Kingdom.
- Randriamaro Z. 2008. Trade, poverty and women's economic empowerment in sub-Saharan Africa. Division for Advancement of Women, New York: United Nations.
- Sengupta R. 2013. The gender dynamics of trade and investment and the post-2015 development agenda: A developing country perspective. Third World Network.
- Titeca K. 2009. The changing cross-border trade dynamics between north-western Uganda, north-eastern Congo and southern Sudan. Crisis States Working Papers Series 2. DESTIN Development Studies Institute, London.
- Titeca K and Kimanuka C. 2012. Walking in the dark: Informal cross-border trade in the Great Lakes Region. International Alert, in collaboration with UN WOMEN, London.
- Tran-Nguyen A-N and Zampetti AB (eds). 2004. *Trade and gender opportunities and challenges for developing countries*. UNCTAD (United Nations Conference on Trade and Development), New York, USA, and Geneva, Switzerland.
- UNCTAD (United Nations Conference on Trade and Development). 2009. *Economic development in Africa: strengthening regional economic integration for Africa's development*. Report 2009. UNCTAD, New York, USA, and Geneva, Switzerland.
- UNECA (United Nations Economic Commission for Africa). 2010. Assessing regional integration in Africa IV: Enhancing intra-African trade. Addis Ababa, Ethiopia: UNECA.

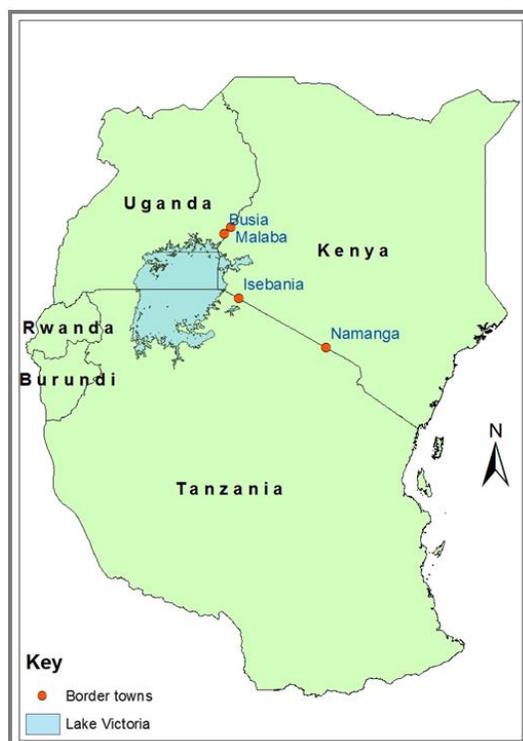
- UN WOMEN (United Nations Entity for Gender Equality and the Empowerment of Women). 2009. Baseline study on women in informal cross border trade in East Africa. UN WOMEN, Regional Office for East and Horn of Africa, Nairobi, Kenya.
- USAID (United States Agency for International Development). 2012. Women in cross-border agricultural trade. Policy Brief 4. Enabling Agricultural Trade (EAT) Project.
- USAID (United States Agency for International Development). 2013. Rwanda cross-border agricultural trade analysis. Publication produced for the United States Agency for International Development by the USAID Enabling Agricultural Trade (EAT) Project, implemented by Fintrac Inc.
- Wanjiku J, Ogada M, Guthiga P, Karugia J, Massawe S and Wambua J. 2012. Exploiting opportunities in intra-regional trade in food staples in COMESA region. ReSAKSS (Regional Strategic Analysis and Knowledge Support System), Nairobi, Kenya.
- Williams TO, Spycher B and Okike I. 2006. Improving livestock marketing and intra-regional trade in West Africa: Determining appropriate economic incentives and policy framework. Nairobi, Kenya: ILRI
- World Bank and Asian Development Bank. 2007. Cross-border trade within the Central Asia Regional Economic Cooperation. Washington, DC: World Bank.
- World Bank. 2010. *Skeins of silk: Borderless bazaars and border trade in Central Asia*. Washington, DC: World Bank.
- World Bank. 2012. Africa can help feed Africa: Removing the barriers to regional trade in food staples. Poverty Reduction and Economic Management, Africa Region. Washington, DC: World Bank.
- Yang Y and Gupta S. 2007. Regional trade agreements in Africa: Past performance and the way forward. *African Development Review*, 19(3), 399–431

Appendices

Appendix A. Trade documentation for agricultural commodities within EAC

Certificate of origin	Required to show that agricultural products originate from EAC: <ul style="list-style-type: none"> ▪ Simplified certificate of origin for goods less than USD 2000 ▪ Certificate of origin for goods more than USD 2000
Import/export declaration form	Required for large consignments of agricultural products
Phytosanitary certificate	Certifies that agricultural products meet sanitary requirements (issued by health inspection bodies of the countries of origin)
Import/export permits	Issued after inspection and satisfaction that products have met all the requirements
Packing list	Required for confirming identity and volume of the products traded
Source: compiled from Kivuva and Magara (2012) and EASSI (2012)	

Appendix B. Selected border crossing points in the EAC region



Busia is an important border crossing point between Kenya and Uganda with substantial trading activities in both directions. While most food staples (maize, beans, tomatoes, dried cassava, bananas, watermelon and pineapples) come from Uganda, Kenya also exports some agricultural commodities, mainly Irish potatoes and cabbages, but in small volumes.

In Malaba, agricultural products, particularly cash crops (mainly coffee, cocoa beans and cotton), are on transit through Kenya to their final destination. Small volumes of imports of food staples (cereals, fruits and beans) destined for local consumption in Kenya were also recorded. Agricultural imports from Uganda include small volumes of fruits and vegetables.

Namanga is both an entry and transit border point for agricultural commodities from Kenyan and Tanzanian markets. The border post is characterized by considerable agricultural trade in commodities like dry maize, beans, fruits (mainly, watermelon and oranges) and vegetables.

In Isebania, trade in food staples is in favour of Tanzania; the main commodities traded are cereals (rice, millet, sorghum and maize), pulses (green grams, beans, groundnuts and peas), fruits (watermelon, pineapples and oranges) and tubers (sweet potatoes). Small volumes of agricultural exports from Kenya include vegetables (cabbages) and pulses (beans).

Appendix C. PPS sampling methodology used

The Probability Proportional to Size (PPS) methodology used in this research study includes different steps, as described in McGinn (2004). The first stage consisted of listing dominant border crossing points with regard to agricultural CBT and their respective estimated populations (see Table 2). The cumulative sum for all border posts was then calculated (25,170). The second stage consisted of defining a sample frame. As the PPS sampling technique allows for the predetermination of a desired sample size, the number

of 500 traders (125 traders for each border) was defined as the sample population for the 4 borders to be surveyed. The third stage consisted of determining the specific borders to be sampled. First, a sampling interval (SI) was calculated $6,293 (25,170)/4$ and a random start (RS: a number between 1 and SI at random) generated using the Excel command $=\text{rand}*SI$ to obtain the first RS = 1,753. Second, four series were calculated:

$$RS = 1,753$$

$$RS + SI (1,753 + 6293 = 8,046)$$

$$RS + 2SI (1,753 + (2*6293) = 14,339)$$

$$RS + 3SI (1,753 + (3*6,293) = 20,632)$$

The four border sites selected were those for which the cumulative sum had the numbers in the series calculated as follows:

Border post	Number of traders (estimates per border)	Cumulative sum	Selected sites
Lwakhakha	960	960	
Malaba	1,960	2,920	1,753
Loitokitok	2,000	4,920	
Namanga	5,200	10,120	8,046
Isebania	5,050	15,170	14,339
Busia	10,000	25,170	20,632

Source: Authors' calculations

Finally, to ensure that all individual traders would have the same probability of being sampled regardless of differences in population size, as outlined in PPS, the same number of traders was to be sampled from each border. The selection interval varied with the estimated population at each border post. Consequently, the interval (estimated population/125) was randomly selecting every 80th, 42nd, 40th and 16th trader in Busia, Namanga, Isebania and Malaba respectively.

Appendix D. Number of agricultural CBT traders (Estimates on a monthly basis during peak season)

Border post	Mode of transportation			Total
	Minibuses and small cars	Trucks/trailers	Day trippers (bicycle, carts, motorbikes, etc.)	
Busia	1,000	6,000	3,000	10,000
Malaba	160	1,000	800	1,960
Lwakhakha	60	400	500	960
Isebania	3,600	250	1,200	5,050
Namanga	3,000	1,000	1,200	5,200
Loitokitok	1,000	400	600	2,000

Source: Authors' extrapolations guided by different sources from customs officials, CBT associations, EAGC trade monitors and agricultural extension offices (Ministry of Agriculture) at the border crossing points.

Note: Estimated population of traders from two official borders (Lwakhakha and Loitokitok) was included for the purpose of PPS sampling technique which requires many clusters from which the specific border posts for the survey should be sampled (McGinn 2004).