Social standards, worker welfare and women's empowerment in modern agri-food systems: A case study of horticultural wage workers in Ghana

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Summary

The world agricultural trade system has experienced tremendous changes in recent years. Agri-food systems are increasingly shifting towards more vertically integrated production systems that are based on commercialization and mechanization. As part of this trend, food quality and safety standards have gained in importance. These developments have also led to an increased consolidation of production units. Large-scale horticultural and floricultural plantations have emerged particularly in developing countries producing vegetables, fruits, and flowers mainly for Europe and the United States. In countries where agricultural production is predominantly characterized by small farmers supplying to local spot markets, this agricultural shift and its consequences for the rural poor needs to be better understood. While an increasing body of literature has analyzed ramifications for smallholder farmers, implications for the welfare of workers and their households are yet to be thoroughly assessed.

This dissertation addresses this research gap by providing empirical evidence from the export pineapple sector in Ghana where large-scale producers dominate. It is composed of three manuscripts, which contribute to the literature by addressing two overarching research questions: (1) does wage employment on horticultural export-oriented plantations contribute to women's empowerment? And (2) does the sustainability standard Fairtrade improve the quality of wage employment on plantations? To answer these questions, we utilize original survey data from households living in the vicinity of pineapple plantations, many of whom are employed there. The compiled data contains information on employment characteristics, socio-demographic information and gender roles within the household. Additionally, company-level information, including capacity and size, are taken into account in the dissertation's econometric analysis.

In chapter I, we introduce the trends and developments of modernizing agri-food systems and provide a conceptual framework for analysis. Following insights into the case study background in Ghana, we focus on the social changes for households engaged in plantation agriculture. Chapter II presents the first manuscript, where feminized employment patterns associated with horticultural export production are analyzed. By using gender-disaggregated data from married households in the sample, we identify wide-ranging indicators reflecting women's empowerment related to resources, such as income, assets, mobility, and time and inputs into decision-making in the household. We apply a new re-weighting technique, called entropy balancing, in combination with regression analysis. Additionally ordinary least squares regression and propensity score weighting are used for comparison and ensuring robustness of the findings. The results show that women employees contribute a much higher share to the overall household income in comparison to women involved in

farming or small-scale businesses. They are also more mobile in their travels, have greater control over assets and spend less time on reproductive household tasks. Women employees also report to have a higher input into household decision-making.

The second manuscript, which is presented in chapter III, focuses on the individual worker level in regards to employment conditions on large-scale plantations. We contribute to the literature on private standards in developing countries' agricultural production systems by considering the effect of the well-established sustainability standard Fairtrade on worker welfare. Using data from 325 workers in eight different pineapple companies in Ghana, we analyze worker's hourly wages and level of satisfaction with their work. We apply a linear, linear mixed model and instrumental variable approach and find that both worker's wages and job satisfaction are higher on Fairtrade certified plantations. Increased levels of job satisfaction are associated with higher wages, improved access to services, contract conditions, leave regulations and labor unions.

Beyond Fairtrade's individual effects for workers, we address its potential for improving broader socio-economic welfare for their households in the third manuscript (chapter IV). We assess the role of Fairtrade on household income, asset accumulation and standard of living via regression analysis and matching approaches. We account for company characteristics by including the scale of production and productivity levels into the analysis. The findings show a positive effect of Fairtrade certification on the selected outcome variables. Higher incomes and asset accumulation are most likely driven by higher wages and the ability of Fairtrade companies to ease household expenditures through the provision of free or subsidized services and loans. Also, better access to electricity and clean drinking water (as proxies for standard of living) is linked to the standard, as Fairtrade funds are used for providing worker communities with economic, health and educational amenities.

We conclude the dissertation in chapter V. with a summary of the findings of all three manuscripts and how these can translate into viable policy recommendations. Plantation agriculture is often regarded as exploitive towards its agricultural workers and therefore unable to generate positive social change. Our findings show that this is not necessarily the case. For policy makers, this means that fostering plantation agriculture can be a viable strategy to help poor households to generate an income. Work regulations and employment conditions should however be regulated and monitored. Certification schemes, such as Fairtrade, can improve worker welfare and help to set standards within a sector.

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Chapter I: Introduction

1. Modern agri-food systems: trends and developments

Global agricultural trade has increased in past decades due to the rapid adaption of agri-food systems to changing consumer preferences and world-wide food demand (Maertens and Swinnen, 2012). Consumers in developing countries have increasingly shifted their diets from filling staple foods with low value like roots, tubers and cereal to higher-value agricultural products, such as meat, dairy, fruits and vegetables (Da Silva et al., 2009). In high-income countries, supermarkets are satisfying the demand for a large variety of fresh tropical fruits and vegetables that are provided year-round in high quality. Addressing food risks and hazards has become more important in past years, particularly in the light of major food scandals such as the E.coli (EHEC) virus outbreak on vegetables in Germany in 2011. Overall, these developments have led to an increased demand for higher-value products that that adhere to certain food safety and production standards (Weinberger and Lumpkin, 2007).

Stricter regulations for food production, processing and distribution have also contributed to the concentration of global food systems, where few multinational firms and food companies dominate the market (Maertens et al., 2012). In search of arable land, more and more companies are expanding the production of high-value commodities such as vegetables, fruits and flowers to developing countries. Due to governmental strategies to improve investment climate, local investors are also expanding into export-oriented horticultural production. We are therefore witnessing a shift away from traditional tropical export crops such as tea, coffee or cocoa particularly in countries such as Senegal, Ghana, Madagascar, Kenya and Ethiopia (Subervie and Vagneron, 2013). Instead companies are taking up production of pineapples, mangoes, papaya, French beans, tomatoes, peppers and others for the export market. Developing countries' share in high-value agri-food exports have nearly doubled from 23% in 1985 to 40% in 2005 (Maertens et al., 2012).

The reason why this transformation of agricultural production in developing countries has spurred attention is particularly due to its perceived potential of reducing poverty, improving livelihoods and ensuring income for rural households (Suzuki et al., 2011). Those to benefit from access to export markets are those suffering particularly from little income generation opportunities, namely farmers and rural workers. This is due to the main sourcing strategies within vertically coordinated supply chains that are dominated by a few exporting companies that source their produce from (1) small- and medium-scale contract farmers and (2) large-scale plantations (Swinnen and Maertens, 2007).

To ensure that certain standards are met by producers, small- and medium-scale farmers are involved in modern agri-food systems through contract farming and so-called outgrower schemes with large-scale plantations, exporters, and local supermarket chains. Contracts can take different forms, from simple marketing contracts to more elaborate contracts including the provision of inputs, training or credits (Maertens and Swinnen, 2014). Because of their high requirements for standard compliance, in some cases exporters are reluctant to contract smallholder farmers. Often, those contracted have larger landholdings, are more educated and have more capital available for irrigation systems or packaging stations (Ashraf et al., 2009; Kersting and Wollni, 2012; Neven et al., 2009), leading to the exclusion of marginalized smallholders (Gibbon, 2003; Minot and Ngigi, 2004). But sectors in different country settings seem to vary greatly as there are examples such as the Malagasy French bean sector where small-scale farmers represent the major share of producers (Minten et al., 2009). Where farmers have been excluded, it is often large-scale plantations that have led to the crowding out as land, labor and inputs are more easily regulated on such sites. Depending on the type of crop and production processes, large-scale farming is often considered to reduce costs in comparison to small-scale production, given economies of scale (Suzuki et al., 2011). Again however, this is not generalizable.

The expansion of large-scale horticultural and floricultural farms and processing plants has also been part of a broader development strategy in many low-income countries (Barrientos et al., 2003). Investments in land and agricultural commercialization can provide an important source for employment generation, technology adoption, knowledge transfer, local and national tax revenue and also corporate values (Deininger and Byerlee, 2012; Paniagua and Sapena, 2014). However, the commercialization of agriculture permeates change in agricultural production systems that are still predominantly characterized by small-scale subsistence farming. Negative implications are associated with exploitive working conditions, poor wages and discriminatory practices as well as unsustainable investments in land, land conflicts and the erosion of land rights.

1.1. Large-scale plantation agriculture: implications for worker households

There are about 500 million women and men working as casual, temporary or permanent workers on plantations, in orchards and glasshouses and in processing facilities (Hurst, 2007). The majority of those households are often considered to be among the poorest and most vulnerable. Mostly they have little arable land and little wealth to invest in alternative productions or businesses. Instead they rely on the availability of rural wage labor to generate an income. The following chapter reviews the effects of household's involvement in plantation agriculture.

Most literature on welfare implications for households engaged on large-scale plantations assesses income effects. A number of studies show that plantation workers receive a constant income and receive high wages (Maertens et al., 2012; Mano et al., 2011; McCulloch and Ota, 2002; Te Velde and Morrisey, 2002). Women workers receive equal wages to men (Dolan and Sutherland, 2002), which are up to 20-50% higher than female wages in comparable industries (Maertens and Swinnen, 2012; Newman, 2002). In their study, Hjort and Villanger (2011) find that the income of female flower farm workers in their sample increased by 154% on average. It should be noted that work activities usually differ for men and women. Women may be barred from higher employment positions as they are more often employed in "unskilled" work, where lower wages are paid than in more "skilled" jobs (Dolan and Sutherland, 2002; Maertens and Swinnen, 2012).

Other studies point to the adverse employment arrangements, which counteract the positive findings for plantation workers to a certain extent. As the production of high-value crops is in many cases seasonal, labor allocation is based on flexibility, where casual, seasonal, temporary and contract-based labor dominates. This leaves the majority of workers without the benefits of permanent employment such as sick or maternity leave and social security (Dolan and Sutherland, 2002). During peak seasons workers are requested to do overtime while in lean seasons their contracts are terminated (Dolan, 2004). Untimely payments of wages and bonuses, lack of social security payments, damage to health and limited worker's rights for unionization, lower the benefits of wage employment on plantations – particularly for women (Barrientos et al., 2005; Barrientos et al., 2003). Ortiz and Aparicio (2007) find that only harvesters without dependents earn sufficient income in the lemon industry in Argentina to escape poverty. Families are unable to cover all necessary expenses to improve their livelihoods. The reason for this is again job seasonality which does not contribute to the reduction of long-term poverty for all workers (Ortiz and Aparicio, 2007). While for migrants, the income earned in the tomato fields and packing plants is fundamental for the bare survival in their home villages, it is again not sufficient to alleviate poverty in their regions in Mexico (Barron and Rello, 2000). Also Patel-Campillo (2010) relates the unfavorable employment practices to the inability of flower plantations in Colombia to lift their (female) workers out of food insecurity and poverty.

Because the emerging agro-industries' workforce is dominated by women in developing countries, working condition concerns are often related to female worker vulnerability. The increase in female employment in modern agri-food systems can be witnessed in numerous countries: over 65% of the workers in horticultural plantations and packing stations in Kenya and Zambia are female (Dolan and Sutherland, 2002). Particularly, the floricultural industries employ women: 70% in Ecuador, 75% in Kenya, and 85% in Uganda (Wilkinson and Rocha, 2009). Women are considered more docile and

careful when working with delicate produce such as vegetables, fruits and flowers. Women are also potentially likely to have lower reservation wages and be less outspoken about adverse employment characteristics. Basing labor sourcing strategies on the supposed inherent characteristics of women have been associated with the temporary, informal and insecure nature of the jobs as women are more accepting of such conditions (Barrientos et al., 2005; Dolan, 2010).

Against this background, recent research has emerged that considers the heterogeneous effects of employment for men and women. Van den Broeck et al. (2016) investigates contractual preferences of female horticultural workers in Senegal and find that more empowered women prefer flexible contract arrangements over permanent ones in order to adapt more easily to changing requirements in the household and their farms. Maertens and Verhofstadt (2013) attribute higher primary school enrollment rates – particularly for girls – to female horticultural employment. In the Senegalese tomato export industry, women workers report increased decision-making power and enjoy greater respect within their communities (Maertens and Swinnen, 2012). The empowerment of women has further been connected to the bargaining of housework redistribution (Newman, 2002) and the reduction of fertility rates (Van den Broeck and Maertens, 2015).

While such findings are more optimistic regarding the benefits of involvement in large-scale plantation agriculture, the concerns about working conditions remain. The following chapter evaluates the literature on the role of standards to contribute to improved working conditions.

1.2. The role of standards in modern agri-food systems

The integration of developing countries into global markets has led to a rise of public[1] and private standards[2] to govern these market relationships. Consumers are increasingly aware of farmers' disadvantages in the global trade systems and workers' unfavorable employment conditions in the food producing industry. This has fostered the importance of private food and sustainability standards demanding the observance of social and environmental regulations from producers. Due to missing governance systems in developing countries, particularly private food standards are considered to have taken over the role of the government to regulate the industry (Henson and Reardon, 2005). As drivers of modern agri-food systems, private standards are receiving increased attention in the literature on their implications for farmers' and workers' livelihoods and welfare (Henson and Reardon, 2005).

1 Public food standards are e.g. maximum residue limits (MRLs), sanitary and phyto-sanitary (SPS) measures, technical barriers to trade (TBT)

[2] Private food standards are e.g. Fairtrade, GlobalGAP, Utz Certified, SA8000, Ethical Trading Initiative, Rainforest Alliance/SAN

Findings are mixed regarding the benefits of certification for farmers in high-value markets. Positive findings relate GlobalGAP certification to better farm gate prices (Kariuki et al., 2012), better quality performance and higher net income (Handschuch et al., 2013), increased quantities sold and fairer prices received (Subervie and Vagneron, 2013). Some studies of Fairtrade and Organic certified farmers demonstrate a reduction in household poverty and vulnerability and an increase in income, living standard, child schooling (Chiputwa et al., 2015; Bacon, 2005; Becchetti et al., 2013; Becchetti et al., 2012). Other studies have less positive conclusions. The benefits of Fairtrade and Organic certification seem to be cancelled out by reduced crop productivity of farmers (Jena et al., 2012) and inefficient management of producer groups (Holzapfel and Wollni, 2014). Also low prices – particularly in coffee – and limited price premiums reduce the probability of Fairtrade and Organic certified farmers to reap economic benefits from certification (Beuchelt and Zeller, 2011; Ibanez and Blackman, 2016; Weber, 2011).

Much fewer studies assess the roles of standards for agricultural wage laborers. Due to different contracts provided to workers, the effects of standards for workers are rather heterogeneous. Casual and temporary workers, hardly benefit from any kind of labor regulations – including standards. Barrientos et al. (2003) find that standards hardly make a difference for women as they are often engaged in such short-term work arrangements. From the worker perspective, the job status is therefore more important for working conditions than the adoption of particular codes of practice in the flower industry in Kenya and wine industry in South Africa (Nelson et al., 2007). As permanent contracts are more likely at code-adopting companies, workers' perception of job security is more pronounced in those companies (Nelson et al., 2007). More recent studies find a stronger linkage of standards to improved working conditions for workers, including remuneration. Looking at the GlobalGAP standard specifically, Colen et al. (2012) link certification to higher daily wages and longer employment periods for laborers. Job security on the other hand does not increase. Ehlert et al. (2014) find higher income levels for workers on Kenyan GlobalGAP certified export vegetable farms but can only associate this to the size of the farm and not necessarily to the certification as non-certified large-scale farms are not included in the analysis. Schuster and Maertens (2017, 2016) find that private labor standards (including Fairtrade) lead to companies' higher likelihood of paying the minimum wage, providing job security and adequate trainings to workers in the Peruvian asparagus sector. Neither the wage level nor the employment periods are found to be significantly affected by private labor standards however. Barrientos and Smith (2007), who look at the implications of the Ethical Trading Initiative for workers, find positive effects for workers in terms of minimum wage payments, adequate working hours, health and safety provisions as well as payment of health insurance and pensions.

Particularly standards with a focus on labor conditions including SA8000, Ethical Trading Initiative, For Life and Fairtrade, may provide ways of improving the livelihoods of workers in the agricultural sector. Fairtrade certification has become increasingly prominent over the past years and together with Organic is one of the most well-known private standards globally. Today, 74 countries produce Fairtrade certified products worth US$8 billion annually ranging from cocoa, sugar and pineapples to wine, cotton and gold (Raynolds, 2017). While its initial intention was to help small-scale farmers to overcome trade barriers, the Fairtrade labelling organization adapted its support strategy to also include plantation workers over time. In 2014, there were 204,000 hired laborers working for 229 Fairtrade certified plantations and companies (Raynolds, 2017).

When it comes to implications of Fairtrade certification for workers on plantations, there is hardly any evidence available to draw conclusions from – both in terms of individual and household welfare effects. There are only a handful of studies focusing on working conditions and their findings are mixed as well. Fairtrade workers earn salaries above the minimum wage (Granville and Telford, 2013) but not higher wages than non-certified plantations (Cramer et al., 2014; Ruben and van Schendel, 2009). The benefits for Fairtrade workers are related to services received and company identification (Ruben and van Schendel, 2009) as well as worker empowerment through unionization (Raynolds, 2012). Raynolds (2012) also stresses the role of Fairtrade premium financed projects to contribute to education and health improvements in worker communities.

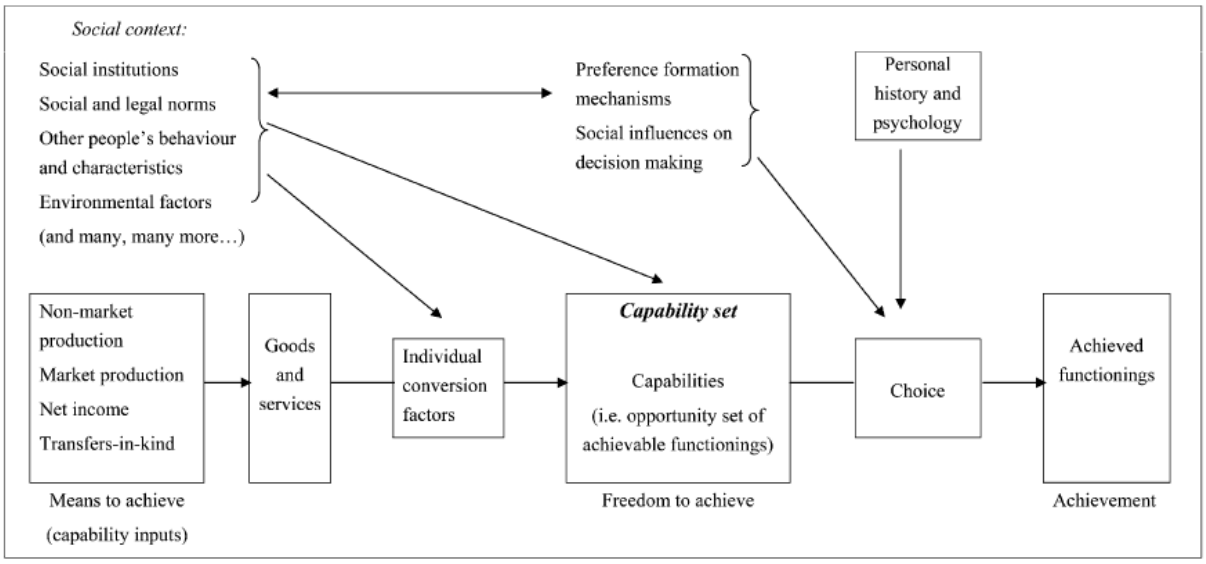
Overall the empirical evidence is still scarce when it comes to the role of large-scale plantations for welfare enhancement of rural communities and the provision of adequate work for the rural population. The contribution of standards to enhance positive ramifications for workers on large-scale plantations is yet to be better understood. To address these gaps systematically, the research objectives are related to a conceptual framework outlined in the following chapter.

2. Framework of thought: the capability approach

In the context of this dissertation, we are not so much interested in the generation of employment as such but rather aim to explore the quality of employment and its meaning for rural development. Amartya Sen's capability approach provides a particularly adequate background to evaluate the role of horticultural employment to contribute to persons' capabilities. As a critique to monetary and one-dimensional assessments of poverty, Amartya Sen developed the capability approach to provide a framework that incorporates multiple dimensions of human well-being (Sen, 1999). Material, mental and social aspects are integrated into the differentiation between the means to achieve well-being and development and the actual outcomes of this effort (Robeyns, 2005).

The core distinction within the capability approach is between the dimensions of capabilities and functionings. Capabilities relate to the possibility of achieving an outcome, for example being healthy as a pre-condition to being able to work. Here, work is the achieved functioning. Other examples of functionings are: literacy, community integration, respect, happiness (Sen, 1984). The approach therefore differentiates between freedoms or options (capabilities) and achievements or outcomes (functionings). In its application these two dimensions are often interchangeable. The attribution of terminology is not static and highly dependent on the context and interpretation of the setting (Robeyns, 2005). For example, while in some countries being well-nourished or healthy is considered as a means, in more impoverished countries it may be considered as an achieved functioning. Figure 1 demonstrates the capability approach while including outward influences on the pathway from a person's resources (good and services) which are transferred into capability and choices, ultimately leading to achieved functionings. The ability to transfer resources into capabilities is influenced by so-called conversion factors: personal (e.g. physical condition, intelligence), social (e.g. social norms, gender roles) and environmental (climate, physical location) conversion factors (Robeyns, 2005). In general, the capability approach particularly emphasizes the importance of capabilities over functioning. According to Sen, development should therefore be regarded as the freedom of choice rather than achieving individual outcomes (Sen, 1999).

Figure 1 Overview of Sen's capability approach



Source: Robeyns (2005)

In the context of this dissertation, we consider the role of employment to contribute towards the generation of a person's capabilities. Particularly in developing countries, employment is regarded as a principle vehicle to enable individual opportunities. Employment may contribute to functionings such as being fed and housed (through adequate remuneration), being healthy (through a safe workplace and adequate work hours) and having an assured future income (through providing

contracts). But also more psychological functionings may be achieved such as the feeling of self-worth (through equal pay for equal work and non-discrimination), personal growth (through the provisions of trainings), social integration (through team work) and identification with a community (through freedom of association) (Miles, 2014; Sehnbruch, 2008). The major leverage to provide such opportunities is labor regulations. The channel through which to enhance workers capabilities lies very much in the quality of employment. The assumption hereby is that only decent work generates opportunities for men and women to realize productive employment where a feeling of freedom, equal rights and security is achieved. Adverse working conditions will most likely not enable the generation of such functionings and rather lead to the opposite. Labor regulations can be achieved via a multitude of approaches. Generally, these are enforced by governments through labor laws and guidelines. In developing countries, where governance is weak, such laws may play little role in ensuring worker rights. Changes in the agri-food systems have spurred new opportunities for the advancement of capabilities – particularly through certification and standards which are often more likely to be thoroughly audited and monitored in comparison to labor laws.

Standards providing for decent work, such as Fairtrade, have the potential of enhancing workers capabilities. This is due to regulations in labor conditions (adequate working hours, overtime regulations, fair remuneration based on a living wage, contract arrangements that must avoid time-bound contracts, paid leave) and social development (training provisions, collective bargaining, service provisions including social security, pension funds, healthcare). Besides the individual capabilities that Fairtrade aims to enhance, particular aspects refer to collective capabilities of the workforce. It stipulates the formation of worker representation or worker unions to foster collective action and bargaining. Worker organization enables the feeling of group membership but can achieve other capabilities such as a safe working environment. Other examples are related to utilizing the Fairtrade premium for socio-economic projects that benefit entire communities. While Sen rejects the notion of collective capabilities (Sen, 2002), scholars that have worked on advancing the approach, have called for the importance of capabilities that can only be achieved through collective action (Ibrahim, 2006).

In this dissertation, the objective is to focus on the various dimensions of the capability approach including resources, capabilities and functionings. Assessing multiple facets and indicators for development allows for the drawing of broader conclusions. In the following chapter, the research objectives are related to the capability approach.

3. Research objectives

The aim of this dissertation is to contribute to the scarce literature in the field of high-value export-oriented plantation agriculture and its repercussions on individuals and households in developing countries. Particularly in the setting of modern agri-food systems, most studies have focused on product market effects while limited attention has been paid to labor market effects. Mostly, income effects for households engaged in horticultural wage labor have been assessed. We aim to contribute to the income debate but also consider an extended approach to welfare, drawing upon the capabilities approach. The emphasis is therefore more directed towards the quality of employment and its contribution to enabling people's capabilities and functionings.

The first manuscript analyzes the effect of female employment in horticultural plantation agriculture for women's empowerment at the household level (chapter II). Due to a variety of outcome variables we are able to link empirical evidence to the theoretical underpinnings of women's empowerment. We differentiate between women's resources (female income, control over assets, mobility and time) and agency (input into household decision-making). In the context of women's empowerment both resources and agency can be understood as capabilities, therefore meaning the potential for women to implement their life choices (Kabeer, 1999). Potential pathways for enhancing empowerment through horticultural employment are related to adequate remuneration, training provision, unionization and the general exposure to interactions and exchange outside the confinements of the individual household. For the analysis we utilize a dataset of 422 married households[3] living in the vicinity of pineapple companies in Ghana. By using a new re-weighting technique entropy balancing (Hainmueller, 2011), we address imbalances in the distribution of covariates between treatment and control group, thereby reducing possible issues of selection bias. We compare this new approach to OLS and propensity score weighting. As explanatory variables, we consider female employment (dummy variable) and years of female employment.

In the second manuscript, we address the role of standards for horticultural wage laborers. As Fairtrade has gained immense momentum over the past years also in mainstream markets, its implications for supporting not only small-scale farmers but also workers are interesting but not yet well understood. As Fairtrade incorporates particular labor standards, it may be more suitable for ensuring fair working conditions on plantations than other certification schemes. Pathways of quality employment that contribute to capabilities include extrinsic (objective) and intrinsic (subjective) factors or rewards. While extrinsic factors are associated with elements such as wages, job stability, and contract status, intrinsic factors relate to task variation, skill development, and pride. In chapter

[3] From our full data set of 532 household we deduct the single households for an assessment of bargaining power within a household of two decision-makers.

III, we assess wage as an extrinsic factor and job satisfaction as intrinsic factor to better evaluate the role of Fairtrade to enhancing worker capabilities. To do so, we utilize a sub-sample of 325 pineapple[4] wage workers and apply a linear, liner mixed model and instrumental variables approach. The comparison of different methodological approaches as well as accounting for company characteristics addresses potential selection bias.

Thirdly, we aim to identify Fairtrade's broader repercussions for rural development. In chapter IV, we analyze the effect of Fairtrade on household income, asset accumulation as well as access to clean drinking water and electricity. As the latter two indicators are provided at the village level, we broaden the scope from individual to collective capabilities and functionings. This is particularly interesting due to Fairtrade's regulations in supporting collective agreements between workers and the company. In this context, collective bargaining can address the improvement of working conditions but also influences socio-economic developments. The Fairtrade fund which is reserved for the implementation of community projects requires the proposals of workers for fund allocation. The consent of workers is required for the execution of projects in local villages. With this research objective we address an additional dimension of the capability approach. We utilize regression analysis and matching approaches while accounting for company characteristics.

Chapter V. summerizes the main findings of this dissertation and concludes with policy recommendations that can be drawn from those findings. Potential gaps for further research are also identified.

4. Case study background

Our study is set in Ghana – a country with one of the most developed economies in West Africa today. Its agricultural sector accounts for about 30% of the country's gross domestic product. For a long time, Ghana has been a key player in the production of traditional cash crops, such as cocoa and coffee. However, the country has also established itself within the modern agri-food system, particularly in the tropical fruit sector. Today Ghana exports pineapple, mango, papaya, bananas and Asian vegetables mainly to the European market.

Particularly Southern Ghana constitutes of fertile soils and favorable weather conditions for the production of fruits and vegetables. As can be seen in Figure 2, this is also were pineapple is predominantly grown – expanding from the central Region along greater Accra region further north towards Lake Volta in Volta Region. There are currently about 15 companies that produce pineapple on large-scale land units, which are leased from the local communities for 50 to 100 years. They fully

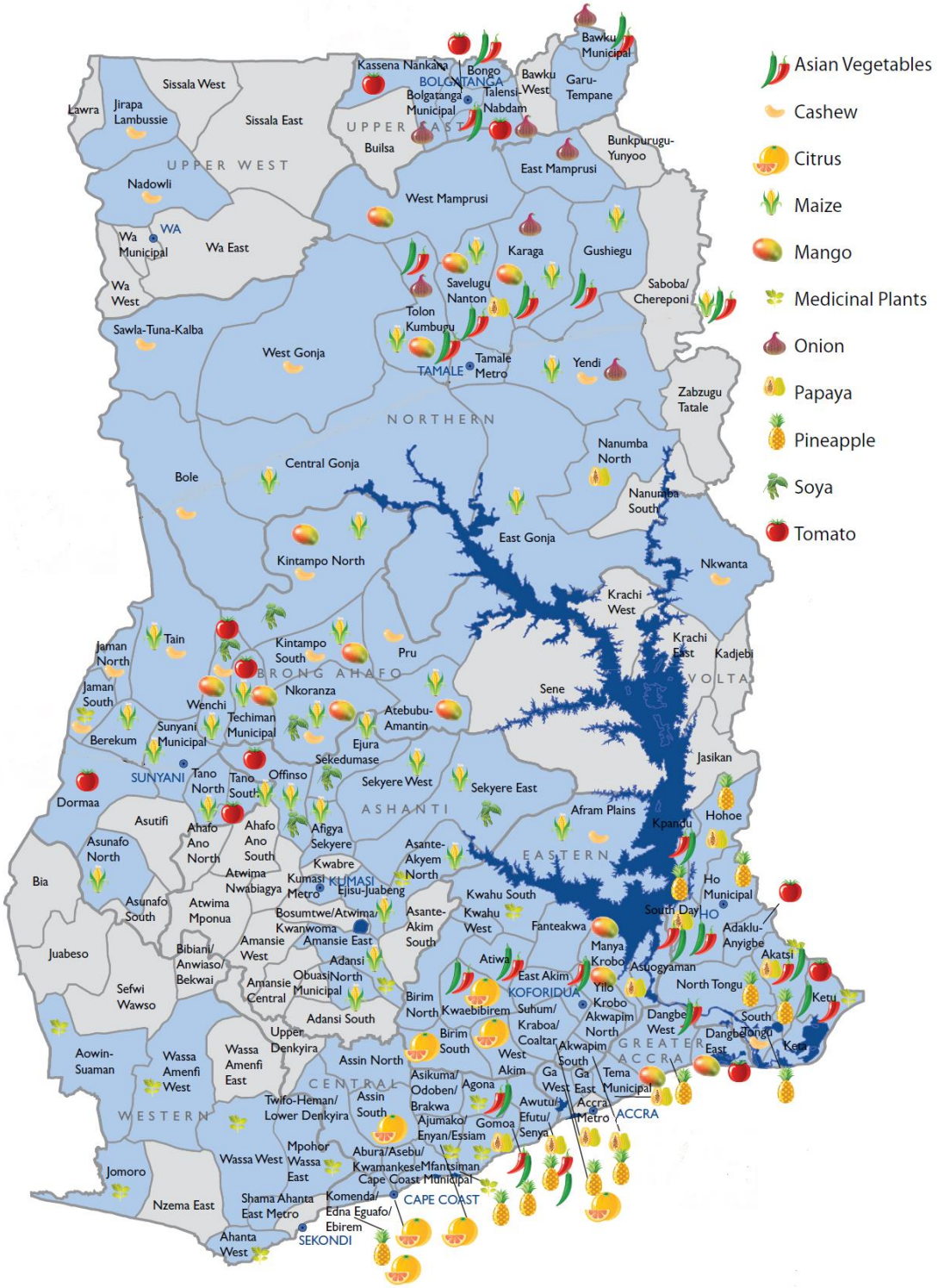
[4] We limit the data set of 532 households to include the 361 workers on pineapple plantations. Our sample size is further reduced to 325 households as we only include manual and low skilled laborers.

rely on workers for their production, which they source from village surrounding their production units. Only one of the companies relies on contract farming for their pineapples and other fruits. This company however sources from rather medium-sized farmers with sufficient investment capital, land and knowledge to fulfil the particular sourcing requirements of the company. There are hardly any small-scale farmers that produce pineapple for the export market. Those that do, operate in high-value niche markets such as Organic to differentiate themselves from other global suppliers. The majority of pineapple farmers produce different varieties, such as “Smooth Cayenne” or “Sugar Loaf” for the local market or supply to local canning and juicing factories (Harou et al., 2017)

Pineapple production in Ghana began in the 1980s and exports of pineapple increased over time until the early 2000. The dominant pineapple type used to be “Smooth Cayenne” and about 50,000 tons were exported at that time. In the mid-1990s Ghana was the 3rd most important supplier of pineapple to the EU (after Cote d’Ivoire as 1st and Costa Rica as 2nd). By the late 1990s, Fresh Del Monte expanded its pineapple production in Costa Rica with a new variety, called MD2. Due to its high yields of fruits with an attractive golden color, high level of sweetness and long storage life, this variety was quickly preferred by consumers and shop owners (Vagneron et al., 2009). Large marketing campaigns in the US and later in Europe led to an increased demand in MD2 pineapple and subsequently to a decreased demand for the “Smooth Cayenne” variety. Within 6 years, the Costa Rican market share in pineapple exports almost doubled from 37% in 2002 to 69% in 2007 (World Bank, 2011).

Ghanaian pineapple producers including many small-scale farmers were slow to adapt to these changes. Particularly smallholders dropped out of export-oriented pineapple production due to required investments for MD2 production regarding planting material, fertilizer and mulching material as well as reduced market presence of larger exporters sourcing from smallholders (World Bank, 2011). This led to a decline in Ghanaian pineapple exports by 31% from 2004 to 2007. The export pineapple sector in Ghana has stabilized again – albeit on a smaller scale. Today, pineapple is the 6th most important export crop in terms of value – after cocoa beans, cocoa butter, cashew nuts, refined sugar and rubber (Gatune et al., 2013). In 2011, the export value of fresh and processed pineapple was worth 51 Million USD (Gatune et al., 2013). All pineapple producers are GlobalGAP certified with other certification schemes also in place, predominantly Fairtrade. The majority of exporters are organized as part of the “Seafright Pineapple Exporters of Ghana” group through which they share joint investments, for example for cooling facilities at the shipping port.

Figure 2 Ghanaian horticultural cash crop production



Source: USAID (2009) Trade and Investment program for a competitive Export Economy (adapted by author)

The pineapple sector in Ghana is a viable case study to assess the implications of households' engagement on export-oriented plantations. The integration into modern agri-food systems is particularly relevant for Africa. This is also due to expectations towards welfare enhancement and poverty reduction through increased international trade. We have selected the pineapple sector as a

case study for this dissertation due to the importance of the pineapple sector as a revenue source for Ghana and the dominant role of large-scale plantations within the sector for export production. While in its beginnings the sector relied on smallholders for the production of pineapples, it has recently shifted to more plantation-based pineapple production. Focusing on workers is therefore is highly relevant in this context. The sector has been established for about 15-20 years and has adopted certifications to market its produce in developing niche markets such as Fairtrade. Instead of only analyzing short-term effects, we are also able to address questions of long-term individual and household effects such as women's empowerment. The substantial adoption of Fairtrade certification allows for a comparison of different companies. While findings in the context of a specific case study cannot be generalized, they may support the understanding of employment effects and how the sustainability standard Fairtrade plays a role in such effects.

4.1. Data

For this dissertation we implemented a field study in Ghana between March and July 2015. To understand the background and developments in the export pineapple sector, key resource persons were interviewed from various sectors including universities, donor agencies, research institutes and exporter representatives. We further interviewed the majority of pineapple companies on information regarding company specific characteristics, such as the scale of pineapple production, services provided to workers and socio-economic projects implemented with support from the company. Subsequently, we established a dataset based on a quantitative survey with 532 households. The households live in 65 villages close to eight pineapple companies that are included in our sample. The different companies were selected based on their comparability in terms of size and capacity of production. Companies provided information about the villages where they source their workers from as well as workers lists. Both villages and workers were randomly selected from those lists. Additional non-workers were randomly selected at village level. The dataset contains information on the socio-demographic of the respondent's households, their education and health status, their income generating and farming activities. All women in the households were addressed with a specific section related to their time use, bargaining power in the household and networks. Plantation workers also answered questions related to their employment conditions; wages and services received as well as job satisfaction. The annex contains the full questionnaire used for data collection.

Chapter II. Modern agri-food systems, horticultural employment and women's empowerment

Abstract:

The transformation of global agri-food systems has led to the increased establishment of export-oriented horticultural plantations in developing countries. These labor intense production sites are associated with feminized employment patterns for the delicate handling of fruits and vegetables and therefore provide employment opportunities for women in rural areas. However, the social implications of these developments for women workers' roles in their households remain hardly understood. We address this research gap by assessing a wide range of indicators reflecting women's empowerment. We use primary survey data of 422 married households in Ghana, living in areas of large-scale pineapple plantations. We apply entropy balancing, a new re-weighting technique, and combine this with regression analysis. This methodological approach is compared with more common models, including OLS and propensity score weighting. We find that female horticultural wage workers contribute a major share to the household's income, are more mobile, have better control over assets and reduced responsibilities in household chores. Women workers also perceive to have a higher input into household decision-making.

Keywords: Women's empowerment, horticultural employment, household decision-making

JEL Codes: D13, J16, J43

This chapter is co-authored by Miet Maertens and Meike Wollni. The author's contributions are as follows: KK, MM and MW designed the research. KK collected, analyzed, and interpreted the data. MM and MW assisted in the analysis and interpretation of the results. KK wrote the paper. MM and MW commented the final draft.

1. Introduction

In recent years, globalization of agri-food systems has led to an increased integration of developing countries into modern supply chains. Particularly the production of high-value horticultural crops has been fostered by the participation in international trade and foreign-direct investments. Modern agri-food systems are characterized by (1) high quality, safety and processing standards (2) vertical coordination along the globally spanning supply chain and (3) a trend towards consolidation of production units to exercise better control over imposed standards (Maertens and Swinnen, 2012). This has led to the establishment of labor intensive production sites, specifically large-scale horticultural and floricultural plantations that have created employment opportunities particularly in rural areas. These developments are associated with feminized employment patterns as companies often prefer women workers over men due to their perceived dexterity and "nimble fingers" to handle delicate produce (Barrientos et al., 2003). At the same time, companies may perceive women to be more docile with lower reservation wages and accepting of adverse working conditions. For example, the share of women in the Zambian fresh vegetable sector and in the flower industry in Kenya is 65% and 75%, respectively (Maertens and Swinnen, 2012). With the ability for women to contribute a stable and potentially permanent income to their household's income, the question remains whether this also leads to women's increased empowerment and higher bargaining power in the household. At the same time, work in export-oriented plantation agriculture is often linked to job insecurity, poor working conditions and insufficient wages. Its potential for generating social benefits has been questioned (Dolan, 2004).

So far, there are only a few studies that address the question of female empowerment through horticultural employment. They focus on either the gendered nature of modern supply chains in general (Barrientos et al., 2003; Dolan and Sutherland, 2002; Maertens and Swinnen, 2012) or discrimination and exploitation at the workplace (Barrientos et al., 2005; Dolan, 2004). Some exceptions exist. Said-Allsopp and Tallontire (2015) assess the Kenyan tea and cut-flower industries and provide evidence on female worker's greater self-reliance, financial independence and improved resistance of men's domination. Maertens and Swinnen (2012) indicate that 94% of women workers in export-oriented horticultural companies in Senegal conclude that their decision-making power in the household has increased, 67% that they enjoy more respect within their community, and 78% that they benefit from meeting and exchanging with other women in the companies. Newman (2002) finds a significant impact of the cut flower industry in Ecuador on men's participation in housework due to women's increased participation in labor force. However, not all studies find female horticultural employment to be favorable for women's empowerment. Friedemann-Sanchez (2006) evaluates employment effects for female and male Columbian floricultural workers regarding their ownership of assets and property. She points out that even though wages are rather equal, female

workers cannot use their wages to accumulate assets or buy property in the way that male workers can due to women's financial responsibilities towards their households. In Ethiopia, Hjort and Villanger (2011) document a significant increase in physical violence (13%) and emotional abuse (34%) of female flower workers by their husbands, and explain this as men's reaction on changing gender roles. Heath (2014) confirms the connection between female employment and domestic violence in Bangladesh, particularly for women who married young and have low education levels.

We contribute to the literature in two ways: (1) by using a quantitative survey-based method we add to the scarce existing empirical evidence on female empowerment in modern agri-food systems and (2) by applying a multidimensional analysis of women's empowerment through the inclusion of a wide variety of indicators. We base our analysis of women's empowerment on the conceptual framework established by Kabeer (1999). In Kabeer's model (1999), a distinction is made between three different domains of empowerment: resources (pre-conditions), agency (processes) and achievements (outcomes). Rather than relying on women's self-reported empowerment, we measure women's empowerment through resources and agency, and use a variety of indicators to represent these domains of empowerment.

2. Conceptual framework

Theoretical underpinnings of women's bargaining power and female empowerment are related to the functioning of a household. The literature differentiates between two main household modelling approaches. Unitary household models (Becker, 1981; Becker, 1974) presume that households have a single utility function, where labor is allocated according to the comparative advantage of household members, income is pooled and preferences for consumption shared and based on rational preferences. In this setting, the choice of the wife to take up work depends on the income of the husband. The higher his earnings, the less likely it is that the wife will involve in income generation herself and vice versa. In terms of labor efficiency, male and female labor can perfectly substitute each other. However, these unitary household models have been highly contested and alternative models depart from the unity assumption within a household (Browning and Chiappori, 1998, Haddad et al., 1997). Asymmetric power, social norms and gender relations are factors that influence expenditure choices and gender-specific division of labor. Bargaining models are based on the recognition that household members may have different preferences and interests, which they bargain for in order to achieve them, either in a cooperative or non-cooperative manner (Quisumbing, 2003). Such household models assume that income and assets are also used for influencing household decisions and therefore affect bargaining power (Doss, 2006). Household members choose to supply labor based on their individual labor and budget constraints and personal objectives.

Our focus and approach on women's empowerment implicitly assumes a non-unitary household bargaining model in which women's labour allocation to off-farm employment is hypothesized to influence their bargaining power within the household. To assess women's empowerment, we follow Kabeer's (1999) definition of empowerment as expansion of people's ability to make strategic life choices. She relates the ability to exercise choice to three connected dimensions: resources (pre-conditions), agency (process) and achievements (outcomes). Resources include economic (e.g. income or assets), human (e.g. education) but also social resources such as a supportive network. Kabeer (1999) identifies agency as the capacity to define personal goals based on motivation and purpose. This reflects the ability to transform these choices into preferred outcomes (Narayan, 2005) through the use of influence, voice and skills (Kabeer, 2008). Finally, achievements are the result of using resources and agency to translate preferences into outcomes. In our paper we focus on the first two dimensions, resources (pre-conditions) and agency (process), because these are the "initial conditions" (Kabeer, 2008) for increased women's empowerment.

We identify four potential pathways of empowerment in the context of horticultural wage labor, potentially influencing both the resources and agency dimension. First, women are able to generate a higher income in comparison to other income-generating activities in rural areas, like agricultural production or small-scale businesses. Therefore they are able to generate substantial financial resources and provide a significant contribution to the household income. This may enable the acquiring of and control over household assets, such as vehicles or agricultural assets. Second, workers receive regular trainings during their employment. These trainings range from first aid to management skills and learning about product hygiene and handling. The acquired knowledge may be applied in agricultural production of the household and therefore contribute to more female input into agricultural decision-making. Third, many workers are engaged in labor unions on the plantations. As labor unions ensure that worker's opinions are taken into account in the company, this requires workers to establish and sometimes voice their viewpoints. The involvement in worker representation may also lead to more engagement outside the company. Fourth, women that are employed outside their home may be exposed to a greater variety of perspectives and way of thinking in comparison to women that mostly stay at home or in the community. As workers are usually allocated into task teams, they engage and communicate with a number of different people during the day. The exposure to different ideas and the ability to use their voices may well enhance the agency of female workers, namely the ability to identify preferred outcomes. This may contribute to women's increased input into household decision-making. The change of mindset and greater confidence can further encourage mobility as women aim to overcome the confinements of their communities.

We consider a large variety of individual indicators to measure the two dimensions of women's empowerment. As part of the resources dimension, we assess overall household income, the female spouse's contribution to the income, the share of assets she owns and is able to sell, her mobility and reproductive workload. The ability to obtain an individual income is considered an indicator of empowerment as it allows women to invest in their preferences, such as personal items or her children's well-being. This implies that she herself can decide over the use of her income. In Ghana, households do not commonly pool incomes and therefore it is likely that female spouses use their incomes for their preferred choices (Chen and Collins, 2014). The ownership of assets and the ability to sell assets are considered to be stronger than income as assets are perceived as being more durable and stable. As control can only be measured in relative terms against that of other household members (Doss, 2006), these indicators are quantified as the share of assets owned and sold. The mobility of women in the public domain is an indicator of social change as women are often constrained in their ability to visit certain places unaccompanied (Mahmud and Tasneem, 2014). We consider this as a resource because women's ability to travel enables her to be economically active or invest in her social networks. Time is an important resource as women contribute to productive tasks and income generation in addition to reproductive tasks such as household chores and childcare activities. Time-consuming activities that may increase women's empowerment but also their workload are often considered the "cost of empowerment". We dispute this negative connotation and measure the impact of employment on time spent specifically on reproductive tasks. For the agency domain we analyze the self-reported input into various areas of household decision-making, ranging from minor household expenditures to agricultural production decisions.

3. Data

We select the Ghanaian pineapple sector as case study for a modern supply chain because it is one of the country's most important horticultural export crops. In 2011, Ghana's export volume of fresh and processed pineapple was worth 51 Million USD and therefore represents the 6th most important export crop in terms of value (Gatune et al., 2013). About 15 large-scale plantations produce pineapples for the export market, eight of which make up for 93% of Ghana's pineapple exports. The sector has been established for a relatively long time period of 15-20 years. This provides a good setting to assess research questions that reflect a slowly changing cultural and social process such as female empowerment. The central area for pineapple production in Ghana is located in rural areas but with access to the airport and shipping port on the coast. Plantations are set up on the periphery of settlements in relatively populated areas where they can source labor easily. Most workers are therefore locals from the surrounding villages of the companies and did not specifically migrate to this area for work opportunities.

We collected original household data in 2015. In a first sampling stage, we purposefully selected eight pineapple plantations that are comparable to each other by choosing those similar in size and scale of capacity. All companies belong to the largest and most productive ones in the sector and can therefore be considered as drivers of the sector. In our context, this is relevant because those agricultural companies that are able to sustain their business over a substantial period of time also have the largest implications for social change and rural development. In a second sampling stage, we received lists of villages, from which the eight selected companies source their workers. We obtained lists of workers within each village, from which we randomly sampled worker households to be interviewed. To generate a control group, we randomly selected non-working households in the same villages. Additionally, we included three villages where no households are employed on pineapple plantations.

Our sample consists of 532 households. To allow a more accurate assessment of inter-household bargaining processes, we only incorporate those households that have two decision-makers and exclude all single households for our empirical analysis. We refer to the main decision-makers as male and female spouse in order to utilize a neutral terminology. Due to the exclusion of single-headed households our sample size is reduced to 422 observations. We differentiate between two groups of female spouses: (1) those who are predominantly employed on a horticultural plantation and (2) those who are self-employed in either agricultural production or in small-scale businesses. Indeed, female wage workers can additionally be self-employed in agricultural or non-agricultural activities besides their wage work. In terms of terminology, we refer to the first group as women employees and the second group as self-employed women. Of our 422 observations, 153 female spouses are women employees on Ghanaian pineapple plantations and 269 are self-employed. A structured questionnaire was used for the survey, which incorporated questions on household characteristics, family health and education levels, land ownership and agricultural production as well as employment conditions, provision of services, labor union involvement in the companies. A gender-specific section was only administered to the female spouses in the household within a secluded and private setting.

4. Methods

4.1. Women's empowerment measures

To relate the potential pathways of women's empowerment to the context of our study, it is important to understand working conditions and company characteristics of the sampled pineapple plantations in Ghana. Table 1 provides us with information on workplace characteristics, the types of jobs women do and the services that are provided by the company. The women in our sample work

on average 7.83 hours a day. The majority of women (70%) works at least 7 hours per day and has a permanent work contract (73%). This means that their employment on pineapple plantations represents their dominant work activity for income generation. They receive trainings ranging from product and personal hygiene to first aid. They are also trained in their particular work task, contributing to their human resources. About 40% of those interviewed report to have participated in at least one training in the past 12 months. Unionization of workers is common in Ghana. Also the majority of pineapple plantations in our study has a company labor union, in which 38% of female workers are members. When it comes to the particular jobs, most women are engaged in washing and packaging of pineapples or field maintenance including soil preparation and weeding. Other work categories are more gendered. Predominantly men are involved in chemical application and more often work in technical and administrative jobs.

Table 1 Workplace characteristics of female horticultural wage workers in the sample

	Variable	Mean Value
Workplace characteristics	Work hours per day	7.83 (1.72)
	Permanent contract	0.73
	Participated in a training in the past 12 months	0.37
	Number of trainings received	1.34
	Labor union present at the company	0.63
	Female worker labor union membership	0.38
Type of job of female workers	Planting and Harvesting	0.19
	Export and Packaging	0.26
	Field preparation and maintenance	0.24
	Sucker management	0.20
	Chemical application	0.06
	Technical management including agronomy	0.02
	General management including administration and supervision	0.02

Standard deviations in parenthesis.

We measure women's empowerment through a number of indicators of the resources and agency domain of empowerment, which are based on the conceptual discussion in section 2. We assess (1) the total household income and (2) the female spouse's share of the household income to identify the contribution of female wages to generating financial resources for the household. We measure the yearly income in log. We identify the (3) share of asset categories owned solely by the female spouse or jointly by both male and female spouse. To do so, we select a range of asset categories that are suitable in the Ghanaian context (vehicles, TV set, radio, fans, freezer, gas stove, kente cloth, bank account, small animals, and poultry). The respondents' reports regarding household member ownership of asset categories also entails the information on who can decide to sell them. Based on these responses we calculate (4) the share of asset categories that female spouses are able to sell from, either independently or together with the male spouse. Women's mobility (5) is assessed through inquiring about their habits of travelling to the capital city Accra by themselves and we

derive a dummy variable from this information. We further measure the distance in km the female spouse overall travels by herself to the market, health center, Accra or her relatives. Female spouse's reproductive workload (6) contains the sum of indoor chores (domestic chores such as food preparation, cleaning, washing clothes), outdoor chores (domestic chores such as fetching water, collecting firewood) and care activities (care activities for children, the elderly, the sick).

We apply a scaling approach to identify the input/ influence on decision-making of the female spouse regarding (1) major household expenditures (large appliances for the house or building investments), (2) minor household expenditures (food for daily consumption or other household needs), (3) crops that are primarily grown for household food consumption, (4) crops that are grown primarily for the sale in the market, (5) non-farm economic activities (such as small businesses, self-employment activities etc.), (6) wage and salary employment and (7) children's education and health. The scale rates from 1=No input to 4=Input into all decisions. Table 2 provides an overview of variables measuring the resources and agency domain of women's empowerment.

Table 2 Description of variables measuring women's empowerment

Dependent variables	Variable type	Variable definition	Frequency (%)				Mean
HH Income	Continuous	Overall household yearly income in log, measured in GHS.					5869.69 (5759.72)
Female income share	Continuous	Share of the household income that the female spouse generates					29.33 (30.87)
Female asset ownership	Continuous	Share of asset categories (vehicles, TV set, radio, fans, freezer, gas stove, kente cloth, bank account, small animals, poultry) owned solely by the female spouse or jointly by both spouses					38.93 (40.14)
Female ability to sell assets	Continuous	Share of asset categories sold by female spouse					35.66 (36.37)
Farthest travel distance	Continuous	Distance that the female spouse travels by herself to the market, health center, Accra or her relatives, measured in km.					138.05 (91.30)
Accra capital city	Dummy	Female spouse travels to the capital city Accra alone					0.73 (0.44)
Female reproductive workload	Continuous	Female spouse's reproductive workload as the sum of indoor and outdoor chores and care activities for children or the elderly, measured in hours.					4.92 (2.61)
Female spouse's self-identified input into decision-making regarding:			1=No input	2=Input into some decisions	3=Input into most decisions	4=Input into all decisions	
…major HH expenditures	Categorical	The range of responses was from 1=No input to 4=Input into all decisions.	11.54	25.72	20.19	42.55	2.94 (1.07)
…minor HH expenditures	Categorical		3.81	22.62	19.29	54.29	3.24 (0.93)
…HH food crop production	Categorical		4.53	24.60	23.95	46.93	3.13 (0.94)
…HH cash crop production	Categorical		5.77	24.62	23.46	46.15	3.1 (0.97)
…HH non-farm activities	Categorical		7.12	23.44	26.41	43.03	3.05 (0.97)
…HH wage labor activities	Categorical		7.47	26.03	27.83	38.66	2.98 (0.97)
…kid's education & health	Categorical		1.72	16.75	26.11	55.42	0.82 (0.82)

Standard deviations in parenthesis.

4.2. Estimation strategy

Estimating the effect of female employment on horticultural plantations on female empowerment is not straightforward because of potential problems of selection bias and reverse causality. In addition to empowerment being influenced by employment, the female spouse's choice in work activity may well be the outcome of her existing bargaining power (Basu, 2006). On the one hand, more empowered women may self-select into employment. Only those women with significant bargaining power can overcome household constraints and are sufficiently mobile to take up employment outside the household. On the other hand, less empowered women may self-select into employment with the ultimate aim to increase their bargaining power in the household. We attempt to reduce this potential bias using simple regression models, propensity score weighted regression models, and an entropy balancing method (Hainmueller, 2011), a new technique that effectively balances the conditioning variables and improves the comparability between treatment and control groups. The model is specified as follows:

(1) $$WE_i = \alpha_0 + \alpha_1 \mathrm{FE}_i + \alpha_2 X_{hh} + \varepsilon_i$$

where (WE_i) is women's empowerment, FE_i is female wage employment, X_{hh} is a vector of other individual and household characteristics, the alphas α are parameters to be estimated and ε is a random error term. Women's empowerment (WE_i) is measured through various indicators as discussed in the conceptual framework and data section and separate regressions are run for each indicator. For continuous outcome variables (household income, female income share, female asset ownership, female ability to sell assets, farthest travel distance, female reproductive workload), we use OLS estimation. For the binary outcome indicator (whether the female spouse travels alone to Accra) we apply Probit regressions. For categorical indicators on input into decision-making, which is measured via a rating with four levels, we use ordered Probit models. Two main explanatory variables FE_i are used, namely (1) a treatment dummy that takes a value of one if the female spouse is employed on a horticultural plantation and zero if otherwise and (2) a continuous variable of the years of female employment on horticultural plantations. We presume that woman's empowerment increases with her length of employment. As this effect may level off at a certain point in time, we add an additional squared term of the years employed to address this. The control variables have been selected in accordance to previous literature on women's empowerment and include among others the age gap and education of the male and female spouse, the religion of the household and its size, and the employment status of the male spouse.

For our second model, we combine regression analysis with propensity score weighting. Using a vector of observed variables (*x*), we predict the probability of female employment (the propensity score) to create a comparable counterfactual group:

(2) $$p(x) = \Pr\{T = 1|x\} = E\{T|x\}$$

A Probit model is used to regress the binary treatment variable on the same covariates as for the control variables in our regression analysis (see appendix table A.1) to derive the propensity score. We add agricultural land as an explanatory variable for women taking up horticultural employment as we assume this to be more likely for landless households. The region of common support is between 0.106 and 0.824 and the balancing properties are satisfied (see appendix figure A.1 and table A.2). Based on the estimated propensity scores, we reweight our data on the propensity score and estimate the regression (1) as specified above.

For our third model, we combine regression analysis with entropy balancing, a new and innovative technique. Entropy balancing reweights the control group observations on balancing requirements (same mean, variance and skewness). Among the possible sets of weights that fulfill these requirements, entropy balancing chooses those that deviate as little as possible from uniform weights (Marcus, 2013; Hainmueller, 2011). The counterfactual mean is estimated as follows:

(3) $$E\left[Y\widehat{(O)|D} = 1\right] = \frac{\sum_{\{i|D=0\}} Y_i w_i}{\sum_{\{i|D=0\}} w_i}$$

where every control group observation receives an entropy balancing weight w_i . These balancing weights are identified via a reweighting scheme that minimizes the entropy distance metric as described in Hainmueller, 2011. In comparison to using propensity scores, which can lead to a decreased balance of some covariates, entropy balancing improves balance for all conditioning variables and is therefore more effective (Marcus, 2013). Again, we select the same conditioning variables for entropy balancing as for the control variables in our regression analysis. These variables are assumingly unaffected by female employment. See appendix table A.3 for conditioning variables before and after balancing. We reweight our data on the entropy balanced data and estimate the regression (1) as outlined.

5. Results and discussion

5.1. Descriptive statistics

Table 3 provides an overview of household characteristics and a mean comparison between women employees and self-employed women. We see that overall there are only few differences between these two groups. They are comparable regarding household demographics in terms of age of the

female and male spouses, their educational attainment, and the number of dependents. The literacy level of the male spouse is slightly lower for households with a women employee. Similarities further exist across religious beliefs but households with women employees are more likely to be Pentecostal. Living conditions are also comparable across households, including access to improved sanitation (approx. 20%), clean drinking water (approx. 80%) and electricity (approx. 85%). Only about 10% of the households own a gas stove, which implies a high demand for firewood that women are responsible to collect. Distances to points of services (markets, health centers, schools) are comparable to a certain degree. On average households with women employees live further away from health centers and closer to Accra than households with self-employed women. It is not surprising to see a large difference in terms of the ownership and usage of agricultural lands. Those households with women employees have significantly less land than the control group. This is in line with the assumption that particularly the landless and near landless self-select into horticultural wage employment.

Table 3 also provides an overview of the individual sources of income for the households, such as income from horticultural wage employment or self-employment (such as trading or a business). Horticultural employment is the largest income source for households with a women employee. In some households (36%) both spouses are actually employed on the plantation. The most important income sources for households with self-employed women are also horticultural employment (of the male spouse), agricultural production and small-scale businesses.

Table 3 Descriptive statistics on individual and household characteristics

Variable	HH with woman employee *(N = 153)*	HH with self-employed woman *(N = 269)*
	Mean	**Mean**
Male spouse is employed on horticultural plantation	0.36	0.43
Age of male spouse	40.16 (9.41)	40.12 (9.96)
Age of female spouse	35.50 (8.52)	34.52 (9.62)
Number of dependents	2.34 (1.58)	2.42 (1.64)
Male spouse has no schooling	0.15	0.11
Male spouse has primary schooling only	0.20	0.17
Male spouse has secondary schooling or higher	0.65	0.72
Literacy level of male spouse	0.61*	0.69
Female spouse has no schooling	0.30	0.27
Female spouse has primary schooling only	0.30	0.28
Female spouse has secondary schooling or higher	0.41	0.45
Literacy level of female spouse	0.39	0.41
Protestant	0.20	0.20
Pentecostal	0.66**	0.56
Catholic	0.07	0.07
Muslim	0.03	0.04
Access to improved sanitation	0.24	0.20
Access to clean drinking water	0.78	0.81
Electricity	0.86	0.84
Distance to market (km)	7.23 (6.90)	7.19 (6.77)
Distance to health center (km)	4.57*** (4.99)	3.11 (3.84)
Distance to primary school (km)	0.21 (0.65)	0.19 (0.57)
Distance to Accra capital city (km)	63.34*** (51.06)	79.66 (61.05)
Distance to pineapple plantation (km)	3.73 (3.52)	3.79 (3.64)
No. of HH asset categories	3.65 (2.18)	3.64 (2.11)
HH owns gas stove	0.10	0.11
Agricultural land (in acres)	1.12*** (1.35)	1.73 (1.79)
Total yearly income (GHS[5])	6559.73* (5902.34)	5477.21 (5650.52)
Total yearly income per adult equivalent [6] (GHS)	2329.03** (2518.33)	1858.30 (2249.01)
Horticultural wage labor income (GHS)	3082.52*** (1856.30)	1242.37 (1727.22)
Agricultural income (GHS)	1018.92 (4029.56)	1199.41 (3663.61)
Income from self-employment (GHS)	940.73*** (1958.51)	1809.59 (2950.83)
Other wage labor income (GHS)	885.18 (2771.61)	672.50 (2356.13)
Other income (e.g. gifts, remittances) (GHS)	79.77 (296.10)	125.25 (494.78)

Standard deviations in parenthesis, * (p<0.1), ** (p<0.05) and *** (p<0.01) for ttest of continuous variables and chi2 test for categorical variables

[5] GHS = Ghanaian Cedi (Exchange rate: 1 GHS = 0.21 Euro cent on 15.June 2015 at the time of survey implementation)

[6] We apply the OECD adult equivalence scale that is weighted accordingly: value 1 for first household member, value 0.7 for each additional adult and value 0.5 for each child under the age of 18 years

Table 4 presents both indicators of resources and agency for empowerment. Regarding the resources domain, we observe that women employees generate an income, which is twice as high as that of self-employed women. While we report the mean here, the large standard deviation suggests that incomes may indeed be very different within the group of self-employed women. The high income of employed female spouses is also reflected in the high share contributed towards the household income, which is almost 50% in comparison to 16% of self-employed women. This substantial income also translates into a higher overall household and per adult equivalent income. In terms of assets, women employees own more assets both in number and in household share than self-employed women. This is also true for the women's ability to sell assets. Regarding the mobility, the differences are less pronounced, but female horticultural workers are more likely to travel unaccompanied to the Accra, capital city of Ghana. Overall, they also travel longer distances to the market, health centers, Accra or relatives. Women employees have a significantly lower reproductive workload than self-employed women. On average, female workers spend 1.08 less hours per day on indoor and outdoor chores as well as care activities. However, they also spend less time on personal activities, such as eating and personal hygiene, social activities with friends and neighbors and sleep. This is owed to their productive workload, including own farm production, horticultural employment, agricultural work off the own farm, and off-farm non-agricultural work. On average, women employees work 7.76 hours per day in comparison to self-employed women, who work 5.28 hours per day.

Ultimately we are also interested in women's input into decision-making within the household as indicators of agency for women's empowerment. And indeed, we see that in terms of descriptive statistics female horticultural workers self-report to have more decision-making power in a number of categories, namely major household expenditures, household food and cash crop production as well as wage labor activities in the household. However, this is not consistent for all categories. Female workers do not confirm increased decision-making regarding minor household expenditures, non-farm activities as well as their children's education and health.

Table 4 Descriptive statistics on women's empowerment indicators

		Variable	HH with woman employee *(N = 153)*					HH with self-employed woman *(N = 269)*				
			Frequency (%)				Mean	Frequency (%)				Mean
Indicators of **resources** for empowerment		Female yearly income in GHS					2420.47*** (1453.01)					1234.23 (3029.02)
		Female income share					48.45*** (27.14)					16.22 (40.58)
		Female asset ownership (number)					1.79** (1.53)					1.39 (1.91)
		Female asset ownership (share)					49.40*** (37.39)					32.97 (40.51)
		Female ability to sell assets (number)					1.67*** (1.69)					1.11 (1.50)
		Female ability to sell assets (share)					45.83*** (36.76)					29.86 (34.91)
		Female spouse travels alone to Accra					0.78*					0.70
		Farthest travel distance (km)					157.95*** (98.23)					126.73 (85.25)
	Time spent by female spouse on…. (in hrs)	… reproductive activities					4.23***(2.16)					5.31 (2.76)
		… personal activities					2.00* (1.19)					2.22 (1.38)
		… own farm production					0.46*** (1.32)					1.89 (3.02)
		… pineapple plantation					7.15*** (3.03)					0
		… agricultural work off the own farm					0.03 (0.20)					0.07 (0.59)
		… off-farm non-agricultural work					0.12*** (0.86)					3.32 (4.04)
		… educational activities					0					0.03 (0.37)
		… indoor chores					2.61*** (1.28)					3.36 (2.03)
		… outdoor chores					0.81 (1.28)					0.99 (1.56)
		… care activities					0.81 (1.12)					0.96 (1.30)
		… shopping, use of services etc.					0.09 (0.45)					0.08 (0.43)
		… social activities					1.56*** (1.46)					2.42 (2.38)
		… sleeping					8.35* (1.30)					8.65 (1.69)
Indicators of **agency** for empowerment	Female spouse's input into decision-making regarding:		1	2	3	4		1	2	3	4	
		…major HH expenditures	6.58	27.63	19.08	46.71	3.06* (1.00)	14.39	24.62	20.83	40.15	2.87 (1.10)
		…minor HH expenditures	1.97	20.39	22.37	55.26	3.31 (0.86)	4.85	23.88	17.54	53.73	3.20 (0.97)
		…HH food crop production	4.95	12.87	25.74	56.44	3.34*** (0.89)	4.33	30.29	23.08	42.31	3.03 (0.95)
		…HH cash crop production	4.60	17.24	25.29	52.87	3.26* (0.91)	6.36	28.32	22.54	42.77	3.02 (0.99)
		…HH non-farm activities	5.93	19.49	30.51	44.07	3.13 (0.93)	7.76	25.57	24.20	42.47	3.01 (1.00)
		…HH wage labor activities	3.97	25.17	27.81	43.05	3.10* (0.91)	9.70	26.58	27.85	35.86	2.90 (1.00)
		…kid's education & health	2.03	14.86	27.03	56.08	3.37 (0.81)	1.55	17.83	25.58	55.04	3.34 (1.00)

Standard deviations in parenthesis, * (p<0.1), ** (p<0.05) and *** (p<0.01) for ttest of continuous variables, chi2 test for categorical variables and Wilcoxon-Mann-Whitney test for ordinal categorical variables.
Categories for input into decision-making: 1=No input, 2=Input into some decisions, 3=Input into most decisions, 4= Input into all decisions.

5.2. Regression results

The main regression results (from OLS, entropy balancing and propensity score weighting) on the indicators of resources and agency for women's empowerment are summarized in table 5 for the binary female employment variable, and in table 6 for the length of female employment. We acknowledge the comparability of the three approaches in terms of direction, magnitude and significance of effects, which are very similar across the three models, which supports the robustness of our findings. We base our results discussion on the estimates of the entropy balancing approach as the most advanced method to reduce potential bias. The full regression results from entropy balancing regressions are reported in appendix tables A.4 and A.6 (for indicators of resources for empowerment) and in appendix tables A.5 and A.7 (for indicators of agency for empowerment). The unweighted and propensity score weighted regression results are very comparable and are not included in the appendix but are available upon request.

Considering the indicators of resources for empowerment in table 5, regression results from the entropy balancing model reveal that female horticultural employment increases household income by 61%. Women employees contribute 32% more income to the household income than self-employed women. This shows the important role of paid employment for women's income contribution at the household level. Furthermore, women employed in the horticultural sector have better control over assets, such as vehicles, radios and TV sets. Women employees' share of household asset ownership increases by 19% and the share of household assets they can decide to sell increases by 13%. The mobility indicators suggest that women employees are 32% more likely to be able to travel independently, for example to the capital city of Ghana. Overall, employed women travel 30 km farther to the market, health centers or their relatives. They are also able to reduce their reproductive workload in the household, spending 1.26 hours less time on chores and care activities. Whether the female spouse achieves this by higher efficiency, less performance or the husband or a child taking over these tasks remains an open question that cannot be answered with our data set. The full regression results (appendix table A.4) show that next to female employment other factors influence women's empowerment as expected. This includes the male employment status, education of both spouses and overall connectivity of the household to the market and other amenities.

We also assess indicators of agency for empowerment and look into women's input into decision-making within the household in table 5. We find female employment to effect increased input into decision-making in the majority of categories. Women employees can better influence decisions regarding major expenditures, household food and cash crop production as well as wage labor

activities. Results for decisions on minor expenditures of the household are not as clear but rather vary across the models. Higher female decision-making power regarding agricultural production may be due to trainings that women receive on plantations. The ability to apply the training content to the personal farm setting may be highly valued by the male spouse. Further, female workers may use some of their wage labor income to purchase farm inputs, such as fertilizer, leading to more decision-making power over household agricultural plots. Female employment does not increase input in decision-making regarding non-farm activities and kid's education and health. Regarding choices for their children, all women seem to have a say in that. Within our sample, 82% of all women confirm that they either have input into most or all decisions made on their children's health or education. We conclude that power in one area of decision making does not necessarily translate into more power in another area. These decision areas may indeed be quite distinct from each other and be bargained over individually. This may depend of the importance the household attributes to the individual area. The full regression results (appendix table A.5) indicate that cultural (religion, regional differentiation) and demographic (age gap) patterns play a large role for determining indicators of agency for empowerment.

Table 6 presents the results of the unweighted, entropy balanced and propensity score weighted regressions with the length of employment in years and years squared. We see women's empowerment increases with the number of years a woman is employed in the horticultural sector. This applies to all indicators, both for the resources and agency domain. The longer the woman has been employed on pineapple plantations, the higher the household income and the more the female worker contributes to this income. Also her asset ownership increases over time. The reason for this could be that women that have been employed for longer, receive higher wages due to more experience or by taking over more responsible jobs that are paid better. From the squared years of employment we see that the relationship between employment and empowerment is a concave one. The increase in income and assets not only eventually levels off but they even decrease again as can be seen by the negative coefficients. This pattern holds for all variables except for women's reproductive workload. Here, longer employed women reduce their reproductive workload over time up to a certain point until it increases again. The reason for this may be that the responsibility of childcare reduces due to their increased empowerment and autonomy. Once grandchildren are born, the workload may increase again because of women's commitment of also taking care of the younger generation. Regarding input into decision-making we again see an increase with more years of employment up to a certain point, which then decreases again. It may be however the case, that older women that have been employed longest have lesser initial bargaining power because they are from a more conservative generation. Social change is slow and is more likely to have an effect in younger strata of society.

Table 5 Overview of the regression results estimating the effect of female employment (binary variable) on empowerment indicators

Outcome variable	Unweighted regression#	Propensity score weighting#	Entropy balancing#
HH Income	0.583***	0.630***	0.610***
	(0.164)	(0.143)	(0.193)
Female income share	32.18***	31.48***	32.18***
	(3.885)	(3.858)	(3.885)
Female asset ownership	17.23***	17.35***	19.06***
	(4.390)	(4.360)	(4.484)
Female ability to sell assets	13.29***	10.11**	13.23***
	(3.832)	(4.167)	(4.142)
Farthest travel distance	35.88***	32.52***	30.13***
	(9.544)	(10.39)	(10.62)
Accra capital city	0.387***	0.335**	0.317**
	(0.150)	(0.160)	(0.159)
Female reproductive workload	-1.183***	-1.298***	-1.263***
	(0.261)	(0.282)	(0.281)
Female input into decision-making…			
…major HH expenditures	0.305**	0.343***	0.293**
	(0.122)	(0.128)	(0.131)
…minor HH expenditures	0.251**	0.260*	0.203
	(0.126)	(0.134)	(0.138)
…HH food crop production	0.613***	0.670***	0.670***
	(0.154)	(0.162)	(0.165)
…HH cash crop production	0.469***	0.478***	0.524***
	(0.163)	(0.165)	(0.165)
…HH non-farm activities	0.184	0.237*	0.294**
	(0.135)	(0.143)	(0.144)
…HH wage labor activities	0.336***	0.351***	0.382***
	(0.124)	(0.132)	(0.138)
…kid's education and health	0.156	0.132	0.202
	(0.129)	(0.136)	(0.139)

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)
Depending on the type of dependent variable, we use OLS, Probit or Ordered Probit regressions

Table 6 Overview of the regression results estimating the effect of female employment (length of employment) on empowerment indicators

Outcome variable	Unweighted regression#		Propensity score weighting#		Entropy balancing#	
	Years	Years squared	Years	Years squared	Years	Years squared
HH Income	0.157**	-0.009	0.161***	-0.010***	0.138***	-0.008**
	(0.066)	(0.006)	(0.047)	(0.004)	(0.048)	(0.004)
Female income share	9.424***	-0.529***	9.035***	-0.487***	8.902***	-0.487***
	(1.563)	(0.140)	(1.405)	(0.137)	(1.259)	(0.115)
Female asset ownership	5.170***	-0.354**	4.313**	-0.264	5.165***	-0.355**
	(1.765)	(0.157)	(1.804)	(0.167)	(1.629)	(0.140)
Female ability to sell assets	2.883*	-0.136	1.628	-0.052	1.746	-0.067
	(1.539)	(0.137)	(1.675)	(0.134)	(1.691)	(0.137)
Farthest travel distance	9.258**	-0.558	7.170*	-0.464	7.712*	-0.504
	(3.815)	(0.343)	(4.307)	(0.382)	(4.066)	(0.365)
Accra capital city	0.115*	-0.004	0.096	-0.004	0.110*	-0.005
	(0.063)	(0.006)	(0.064)	(0.006)	(0.060)	(0.005)
Female reproductive workload	-0.367***	0.020**	-0.377***	0.022***	-0.354***	0.020***
	(0.104)	(0.009)	(0.095)	(0.008)	(0.089)	(0.007)
Female input into decision-making regarding….						
…major HH expenditures	0.132***	-0.009**	0.147***	-0.010***	0.112**	-0.008**
	(0.047)	(0.004)	(0.046)	(0.004)	(0.047)	(0.004)
…minor HH expenditures	0.098**	-0.008*	0.113**	-0.009**	0.071	-0.006
	(0.049)	(0.004)	(0.051)	(0.004)	(0.051)	(0.005)
…HH food crop production	0.216***	-0.015***	0.245***	-0.017***	0.212***	-0.014***
	(0.058)	(0.005)	(0.054)	(0.004)	(0.056)	(0.004)
…HH cash crop production	0.161***	-0.012**	0.156***	-0.011***	0.151***	-0.010***
	(0.060)	(0.005)	(0.057)	(0.004)	(0.057)	(0.004)
…HH non-farm activities	0.075	-0.006	0.092*	-0.006	0.068	-0.005
	(0.052)	(0.004)	(0.049)	(0.004)	(0.052)	(0.004)
…HH wage labor activities	0.120**	-0.008**	0.133***	-0.010**	0.112**	-0.008*
	(0.048)	(0.004)	(0.051)	(0.004)	(0.052)	(0.005)
…kid's education and health	0.068	-0.006	0.089	-0.008	0.070	-0.006
	(0.049)	(0.004)	(0.047)	(0.004)	(0.049)	(0.004)

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01) # Depending on the type of dependent variable, we use OLS, Probit or Ordered Probit regressions

6. Discussion

Our findings show that female agricultural employment in modern agri-food systems can contribute to women's empowerment in the domains of resources and agency and that this empowerment increases with the length of employment. Positive effects are found for economic resources (household income, female share of household income, asset ownership and ability to sell assets) and human resources (mobility and time). Particularly the generation of a substantial and stable income has implications for women's roles in the household. Female workers' contribution to the overall household income is 32% higher than in households where the woman is either involved in agricultural production or self-employed. Such opportunities for income generation are particularly relevant in rural areas, where women have few choices of being employed. The Ghana Living

Standard Survey 6 confirms that the female participation rate in the formal economy is very low: 11.7% in comparison to 29.5% of men are engaged in wage employment (Ghana Statistical Service, 2015). In rural areas, only 4.5% of women (vs. 12.9% of men) are employed in private companies, public and non-profit organizations (Ghana Statistical Service, 2015). The main sectors of employment are private, public and non-profit organizations. In rural areas compared to 12.9% of men. Instead, women are often engaged in unpaid family labor and in small-scale businesses (FAO, 2012). Employment as such, both at home and outside, does not necessarily create these effects. This is mainly because the work they then do, like small businesses or trading, is rather inefficient and unproductive. The income generated from these sources is often neither large nor stable enough to bring about change in household's gender relations. For example, Anderson and Eswaran (2009) find that only employment outside of the husband's farm and not employment in general leads to women's greater autonomy. Also, our findings confirm that increased empowerment in the resources domain also leads to empowerment in the agency domain. Female horticultural workers report an increased input into decision-making for the majority of the selected areas. With the traditional role setting of Ghanaian households, these are interesting insights. Male spouses are in charge of household decision-making as they are the ones generating the major income for the household. Dako-Gyeke and Owusu (2013) report the view of a small-scale farmer in Ghana: *" . . . as a man, I work and bring in all the money, I am in charge of the household decision making . . .women just play a minor role. For instance, if there is an issue you can choose to inform the woman or not, but the man is the one who plays an active role by taking care of the woman, family and even the woman's extended family".*

Based on our findings for the two dimensions of resources and agency, we can confirm that both dimensions are linked to each other. Not only does agricultural employment increase women's access to resources of income, time and mobility but also women's feeling of higher bargaining power and voice in the household. This supports the Kabeer's (1999) conceptualization of women's empowerment within the framework of the non-unitary household model (see section 2). The household bargaining model stipulates that individual preferences lead to bargaining over resource allocation and expenditure patterns. The empowerment of women is therefore reflected in the access to economic and human resources. In our case of female horticultural employees, these resources are related but not restricted to higher incomes generated by women. Women employees receive company trainings, which may be useful for the household's agricultural production. Women may further be exposed to different ways of thinking related to gender perceptions. Labor unions enable women to learn about rights and representation, which can be utilized in different spheres of living outside of company grounds.

Our findings are also in line with those of other studies that assess the ramifications of modern supply chains that rely on gendered structures for agricultural production and processing. For example, studies in the Kenyan cut-flower and tea as well as the Senegalese tomato industry find that female workers perceive their decision-making power to be greater (Maertens and Swinnen, 2012; Said-Allsopp and Tallontire, 2015). We confirm that these perceptions of greater autonomy are also reflected in improved access to resources. Our findings on time resources connected to reproductive workload support those of Newman (2002) who provides evidence that due to female employment on flower farms, their male spouses take over more household responsibilities in Ecuador. Whether female workers are always able to utilize their resources according to their choices may depend on different regional settings and expectations towards women. Friedemann-Sanchez (2006) concludes that female flower workers in Colombia have greater constraints in buying assets or property in comparison to male flower workers even though their wages are basically equal. However, the comparison of women to men may require a different conceptual approach.

7. Conclusion

We conclude that export horticulture and large-scale agriculture can contribute to women's empowerment through employment creation. We differentiate between two different domains of empowerment: resources and agency (Kabeer, 1999). By doing so, we link the analysis to a conceptual framework of women's empowerment that assumes a non-unitary household bargaining model. Our findings show positive effects of horticultural employment on resources indicators including household income, female contribution to the household income, asset ownership, ability to sell assets and female mobility. Further, the time spent on chores and care activities is significantly reduced for female workers. Better access to economic and human resources also translates into an increased input into household decision-making. We find that women employees have more say regarding major expenditures, household food and cash crop production as well as wage labor activities.

With this study we add to the scarce empirical literature on gender effects of modern agri-food systems. We corroborate earlier derived conclusions on higher perceived self-reliance and autonomy by assessing additional agency indicators of empowerment. We contribute further by expanding the analysis to more resources-based indicators. However, we recognize the shortcomings of our study. As we use a cross-sectional data set for our analysis, we cannot fully rule out selection bias. We aim to reduce such bias through econometric techniques, particularly the innovative entropy balancing approach that improves the balance of covariate distribution. However, panel data evidence is needed to fully disentangle causal relationships of employment and empowerment.

Ultimately, the results of our study emphasize that employment effects are important to consider when analysing the implications of modernization of agriculture and increased high-value exports. Employment opportunities for income generation and empowerment should be reflected in the context of pro-poor development strategies.

Appendix

Table A.1 Propensity score for female employment

Variable	Propensity score
Male spouse is employed	-0.322** (0.141)
Age gap	-0.011 (0.010)
Female spouse age	0.010 (0.008)
Dependency ratio	0.0001 (0.001)
Education gap between spouses	-0.003 (0.021)
Female spouse is literate	0.068 (0.181)
Male spouse is literate	-0.298 (0.180)
Pentecostal	0.375** (0.170)
Catholic	0.441 (0.303)
Muslim	-0.121 (0.395)
Traditionalist	-0.415 (0.311)
Distance to market	-0.031** (0.012)
Distance to health center	0.050** (0.021)
Distance to Accra	0.001 (0.005)
Total agricultural land	-0.168*** (0.043)
Greater Accra	0.302 (0.205)
Eastern Region	0.293 (0.258)
Volta Region	-0.218 (0.696)
Constant	-0.364 (0.435)

Standard errors in parenthesis.
Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)

Figure A. 1 Propensity score overlap treatment and control group

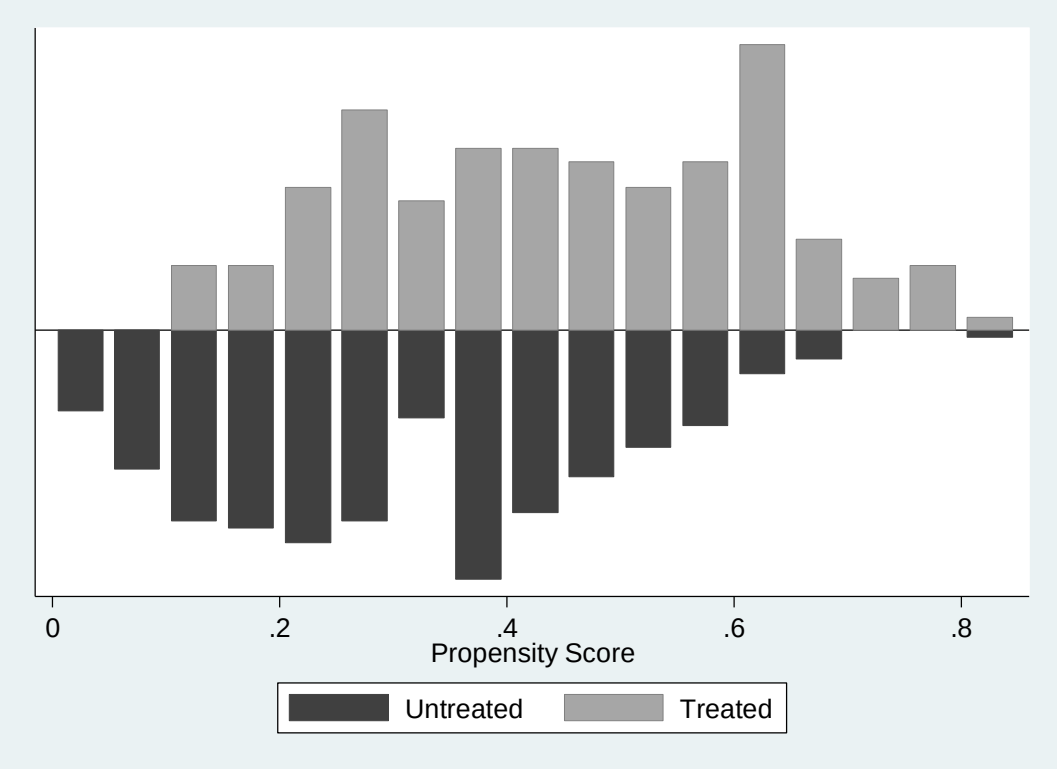


Table A.2 Overview of Propensity Score Balancing Properties

	Treatment and Control	N	Propensity Score Mean
Block 1	HH with women employee	10	0.155 (0.030)
	HH with self-employed woman	53	0.155 (0.026)
Block 2	HH with women employee	52	0.302 (0.057)
	HH with self-employed woman	101	0.300 (0.063)
Block 3	HH with women employee	51	0.487 (0.059)
	HH with self-employed woman	74	0.496 (0.059)
Block 4	HH with women employee	38	0.662 (0.060)
	HH with self-employed woman	10	0.644 (0.029)
Block 5	HH with women employee	1	0.824
	HH with self-employed woman	1	0.814

Standard deviations in parenthesis, * (p<0.1), ** (p<0.05) and *** (p<0.01) for ttest of continuous variable

Table A.3 Overview of conditioning variables before and after entropy balancing

Before weighting	**Treat**			**Control**			**After weighting**		
	Mean	*Variance*	*Skewness*	*Mean*	*Variance*	*Skewness*	*Mean*	*Variance*	*Skewness*
Male spouse is employed	0.3553	0.2306	0.6048	0.4349	0.2467	0.2625	0.356	0.2301	0.6016
Age gap	4.678	22.94	0.7495	5.602	35.72	1.277	4.675	22.92	0.7518
Female spouse age	35.51	73.09	.4808	34.52	92.58	.6218	35.49	73.04	0.4879
Dependency ratio	101.3	4723	0.8049	10.5.4	5597	0.7831	101-3	4721	0.8076
Education gap between spouses	2.013	17.73	0.5262	2.297	14.58	0.2602	2.012	17.73	0.5271
Female spouse is literate	0.3882	0.2391	0.459	0.4126	0.2433	0.3549	0.3888	0.2385	0.4564
Male spouse is literate	0.6118	0.2391	-0.459	0.6914	0.2141	-0.829	0.6112	0.2385	-0.4561
Catholic	0.07237	0.06758	3.301	0.06691	0.06267	3.466	0.07248	0.06748	3.298
Pentecostal	0.6645	0.2244	-0.6967	0.5576	0.2476	-0.232	0.6637	0.224	-0.6929
Muslim	0.02632	0.02579	5.918	0.04089	0.03937	4.637	0.02636	0.02576	5.913
Traditionalist	0.03947	0.03817	4.73	0.1041	0.0936	2.593	0.03954	0.03812	4.726
Distance to market	7.229	47.86	1.183	7.195	45.83	1.236	7.225	47.83	1.185
Distance to health center	4.53	24.82	0.8783	3.108	14.71	1.305	4.527	24.81	0.8801
Distance to Accra	63.5	2621	1.695	79.66	3727	0.896	63.46	2620	1.698
Eastern Region	0.1053	0.09481	2.572	0.08922	0.08156	2.882	0.1056	0.09479	2.567
Central Region	0.2039	0.1634	1.469	0.2416	0.1839	1.207	0.2046	0.1634	1.464
Volta Region	0.1711	0.1427	1.747	0.3086	0.2141	0.829	0.1716	0.1427	1.742

Table A.4 Regression results for measures of women's empowerment (resources) after entropy balancing with dummy for female employment

Variable	HH Income	Female income share	Female asset ownership	Female ability to sell assets	Farthest travel distance	Accra capital city	Female reproductive workload
	OLS	OLS	OLS	OLS	OLS	Probit	OLS
Woman employee	0.610***	32.83***	19.06***	13.23***	30.13***	0.317**	-1.263***
	(0.193)	(4.009)	(4.484)	(4.142)	(10.62)	(0.159)	(0.281)
Male spouse is employed	0.373**	-6.841*	-0.880	-18.24***	6.221	0.362**	0.778**
	(0.167)	(3.577)	(4.962)	(4.250)	(11.59)	(0.180)	(0.320)
Age gap	0.028	0.331	0.0004	-0.856*	-0.358	-0.007	0.060*
	(0.017)	(0.461)	(0.472)	(0.464)	(1.051)	(0.016)	(0.034)
Female spouse age	0.014	-0.147	-0.108	-0.006	0.648	-0.009	-0.033*
	(0.009)	(0.280)	(0.244)	(0.230)	(0.605)	(0.009)	(0.017)
Dependency ratio	-0.001	-0.002	0.087***	0.064**	0.068	-0.001	0.0004
	(0.001)	(0.026)	(0.031)	(0.030)	(0.079)	(0.001)	(0.002)
Education gap between spouses	0.021	0.814	-0.108	-0.205	-1.774	-0.039*	-0.035
	(0.028)	(0.808)	(0.698)	(0.592)	(1.662)	(0.023)	(0.040)
Female spouse is literate	0.193	3.147	0.480	-3.491	-1.466	-0.022	-0.693**
	(0.309)	(7.815)	(5.407)	(5.277)	(15.41)	(0.226)	(0.301)
Male spouse is literate	0.234	-3.855	5.578	7.065	9.614	0.323	0.419
	(0.178)	(6.705)	(5.927)	(5.489)	(15.25)	(0.217)	(0.356)
Pentecostal	-0.021	1.408	-3.121	6.407	14.74	-0.146	-1.061**
	(0.350)	(15.38)	(9.428)	(8.301)	(25.67)	(0.358)	(0.531)
Catholic	0.387*	-6.318	-5.817	0.903	4.890	0.141	-0.589
	(0.234)	(4.353)	(5.789)	(5.206)	(15.62)	(0.200)	(0.382)
Muslim	0.482	-10.69	-3.583	-14.71*	-3.471	0.396	-1.991***
	(0.298)	(6.939)	(13.54)	(8.492)	(20.09)	(0.425)	(0.675)
Traditionalist	0.024	-7.750	3.154	15.89	-6.515	0.132	-0.122
	(0.529)	(7.251)	(11.33)	(10.06)	(30.41)	(0.390)	(1.014)
Distance to market	-0.053**	-0.257	0.336	-0.208	1.977**	0.009	-0.027
	(0.023)	(0.273)	(0.446)	(0.437)	(0.917)	(0.016)	(0.027)
Distance to health center	0.002	0.367	-0.025	-0.930*	-0.619	0.006	-0.033
	(0.028)	(0.631)	(0.629)	(0.563)	(1.627)	(0.024)	(0.037)
Distance to Accra	-0.001	-0.140	-0.112	0.026	0.240	0.004	-0.0078
	(0.008)	(0.145)	(0.167)	(0.167)	(0.405)	(0.006)	(0.010)
Eastern Region	0.053	8.320	21.13***	-5.644	-30.09*	-0.053	-1.789***
	(0.266)	(6.840)	(8.115)	(6.930)	(18.18)	(0.292)	(0.390)
Central Region	-0.249	5.941	-2.489	-16.18***	-8.633	0.055	-1.545***
	(0.204)	(5.701)	(7.271)	(5.817)	(15.46)	(0.235)	(0.394)
Volta Region	-0.329	14.87	15.56	-15.96	-13.12	-0.255	-0.348
	(1.014)	(18.24)	(22.01)	(22.37)	(54.05)	(0.789)	(1.194)
Constant	7.269***	30.61**	26.80	43.33***	73.04*	0.317	8.050***
	(0.589)	(15.10)	(16.41)	(14.78)	(39.64)	(0.605)	(0.910)
Observations	421	421	390	390	421	421	421
R-squared	0.146	0.196	0.123	0.164	0.075		0.207

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)

Table A.5 Regression results for measures of women's empowerment (agency) after entropy balancing with dummy for female employment

Variable	Female input into decision-making regarding…						
	…major expenditures	…minor expenditures	…food crop production	…cash crop production	… non farm activities	… wage labor activities	…kid's education and health
	Ordered Probit						
Woman employee	0.293**	0.203	0.670***	0.524***	0.294**	0.382***	0.267
	(0.131)	(0.138)	(0.165)	(0.165)	(0.144)	(0.138)	(0.177)
Male spouse is employed	0.166	0.112	0.022	0.052	0.196	-0.132	0.293
	(0.139)	(0.147)	(0.172)	(0.183)	(0.156)	(0.156)	(0.186)
Age gap	0.017	0.037**	0.049***	0.049***	0.015	0.009	0.053***
	(0.014)	(0.015)	(0.014)	(0.016)	(0.015)	(0.013)	(0.020)
Female spouse age	-0.001	-0.001	-0.007	-0.007	-0.014	-0.006	-0.002
	(0.008)	(0.008)	(0.009)	(0.010)	(0.009)	(0.009)	(0.011)
Dependency ratio	-0.0004	-0.0004	0.001	-0.001	-0.001	-0.001	0.0004
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education gap between spouses	-0.016	-0.024	0.015	-0.030	-0.037*	-0.015	-0.003
	(0.020)	(0.021)	(0.026)	(0.030)	(0.021)	(0.021)	(0.0275)
Female spouse is literate	-0.052	-0.283	-0.122	-0.334	-0.288	-0.101	0.063
	(0.184)	(0.211)	(0.243)	(0.266)	(0.212)	(0.196)	(0.247)
Male spouse is literate	-0.218	-0.016	-0.121	0.066	0.139	-0.036	-0.271
	(0.182)	(0.202)	(0.208)	(0.228)	(0.184)	(0.181)	(0.236)
Pentecostal	1.007***	0.759**	0.814**	1.168***	0.886***	0.358	2.108***
	(0.305)	(0.328)	(0.388)	(0.379)	(0.321)	(0.337)	(0.452)
Catholic	0.023	-0.077	-0.242	-0.031	-0.305	-0.252	0.294
	(0.166)	(0.177)	(0.213)	(0.211)	(0.189)	(0.170)	(0.219)
Muslim	-0.343	-0.076	-0.556*	-0.277	-0.007	0.045	0.699
	(0.270)	(0.338)	(0.300)	(0.332)	(0.407)	(0.316)	(0.495)
Traditionalist	0.665*	0.551*	0.301	0.481	0.331	0.926***	-0.100
	(0.344)	(0.281)	(0.344)	(0.340)	(0.344)	(0.309)	(0.424)
Distance to market	0.005	0.005	0.020	0.021	0.002	0.003	0.031
	(0.011)	(0.013)	(0.014)	(0.016)	(0.014)	(0.013)	(0.019)
Distance to health center	-0.038*	-0.021	-0.019	-0.037*	-0.006	-0.019	-0.016
	(0.020)	(0.020)	(0.022)	(0.021)	(0.023)	(0.021)	(0.025)
Distance to Accra	-0.003	0.001	-0.006	-0.008	0.004	0.003	0.001
	(0.005)	(0.005)	(0.006)	(0.007)	(0.006)	(0.005)	(0.007)
Eastern Region	-0.055	0.096	0.051	0.0001	0.022	0.087	0.231
	(0.220)	(0.226)	(0.302)	(0.321)	(0.260)	(0.240)	(0.312)
Central Region	0.436**	0.555***	0.589***	0.474**	0.363*	0.577***	0.629**
	(0.213)	(0.210)	(0.217)	(0.235)	(0.215)	(0.210)	(0.256)
Volta Region	0.292	0.191	1.347	1.571*	-0.230	0.075	0.286
	(0.693)	(0.682)	(0.849)	(0.927)	(0.839)	(0.714)	(0.905)
Constant	-1.342***	-1.663***	-1.705***	-1.923***	-1.806***	-1.583***	0.074
	(0.486)	(0.544)	(0.525)	(0.627)	(0.590)	(0.473)	(0.728)
	-0.394	-0.444	-0.425	-0.639	-0.730	-0.470	
	(0.474)	(0.515)	(0.537)	(0.627)	(0.580)	(0.468)	
	0.162	0.119	0.334	0.068	0.008	0.298	
	(0.475)	(0.517)	(0.533)	(0.631)	(0.578)	(0.467)	
Observations	415	419	308	259	336	387	405

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)

Table A.6 Regression results for measures of women's empowerment (resources) after entropy balancing with continuous variable for length of employment

Variable	HH Income	Female income share	Female asset ownership	Female ability to sell assets	Farthest travel distance	Accra capital city	Female reproductive workload
	OLS	OLS	OLS	OLS	OLS	Probit	OLS
Years of female employment	0.138***	8.902***	5.165***	1.746	7.712*	0.110*	-0.354***
	(0.048)	(1.259)	(1.629)	(1.691)	(4.066)	(0.060)	(0.089)
Years of female employment - squared	-0.008**	-0.487***	-0.355**	-0.067	-0.504	-0.005	0.020***
	(0.004)	(0.115)	(0.140)	(0.137)	(0.365)	(0.005)	(0.007)
Male spouse is employed	0.241**	-8.519***	-2.857	-19.98***	-9.993	0.332*	0.849***
	(0.119)	(3.291)	(4.595)	(4.260)	(10.85)	(0.170)	(0.274)
Age gap	0.010	0.146	-0.073	-0.675	0.852	0.005	0.039
	(0.013)	(0.360)	(0.448)	(0.438)	(0.977)	(0.015)	(0.028)
Female spouse age	0.013	-0.166	-0.046	-0.078	0.774	-0.012	-0.032**
	(0.009)	(0.320)	(0.246)	(0.227)	(0.573)	(0.009)	(0.016)
Dependency ratio	-0.001	0.015	0.070**	0.056*	-0.017	-0.002	-0.002
	(0.001)	(0.026)	(0.029)	(0.032)	(0.079)	(0.001)	(0.002)
Education gap between spouses	0.040*	0.884	0.112	-0.560	-1.555	-0.042*	-0.034
	(0.022)	(0.763)	(0.608)	(0.645)	(1.695)	(0.022)	(0.042)
Female spouse is literate	0.442**	3.481	0.405	-5.752	10.89	0.173	-0.641**
	(0.183)	(7.270)	(5.290)	(5.311)	(14.67)	(0.218)	(0.308)
Male spouse is literate	0.237	-4.721	3.645	5.531	12.82	0.251	0.593*
	(0.174)	(6.667)	(5.706)	(5.729)	(13.89)	(0.197)	(0.326)
Pentecostal	-0.697	-7.823	2.837	19.61**	-4.597	-0.287	-0.550
	(0.670)	(15.39)	(8.079)	(9.517)	(23.55)	(0.344)	(0.608)
Catholic	0.415**	-8.352**	-3.549	4.953	-7.548	0.084	-0.415
	(0.209)	(4.234)	(5.688)	(4.989)	(14.78)	(0.193)	(0.346)
Muslim	0.498*	-16.01**	-0.761	-7.733	2.038	0.630	-1.545**
	(0.258)	(8.140)	(13.41)	(9.960)	(23.97)	(0.479)	(0.677)
Traditionalist	0.118	-7.472	10.87	18.67*	-9.441	0.140	0.223
	(0.495)	(5.972)	(11.41)	(10.83)	(25.81)	(0.373)	(0.967)
Distance to market	-0.046***	-0.226	-0.260	-0.213	2.549**	0.011	-0.007
	(0.016)	(0.260)	(0.386)	(0.386)	(1.043)	(0.015)	(0.022)
Distance to health center	0.019	0.219	0.900	-0.053	-2.723*	-0.026	-0.059
	(0.021)	(0.435)	(0.625)	(0.641)	(1.560)	(0.025)	(0.036)
Distance to Accra	0.008	-0.014	-0.124	-0.025	0.752**	0.006	-0.004
	(0.005)	(0.132)	(0.148)	(0.154)	(0.367)	(0.006)	(0.008)
Eastern Region	0.135	14.12**	18.13**	3.483	-35.02*	-0.303	-1.879***
	(0.263)	(5.468)	(8.098)	(7.573)	(21.15)	(0.288)	(0.417)
Central Region	-0.017	12.48***	2.393	-11.69*	-12.43	-0.027	-1.746***
	(0.204)	(4.821)	(7.048)	(7.087)	(14.18)	(0.245)	(0.400)
Volta Region	-0.983	9.172	18.61	-4.265	-97.52**	-0.814	-1.083
	(0.655)	(15.74)	(19.64)	(20.57)	(47.07)	(0.722)	(1.087)
Constant	6.741***	29.11*	29.35*	45.57***	72.75*	0.590	7.779***
	(0.611)	(16.08)	(16.38)	(15.13)	(37.25)	(0.575)	(0.874)
Observations	420	420	389	389	420	420	420
R-squared	0.166	0.173	0.087	0.145	0.086		0.176

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)

Table A.7 Regression results for measures of women's empowerment (agency) after entropy balancing with continuous variable for length of employment

Variable	Female input into decision-making regarding…						
	…major expenditures	…minor expenditures	…food crop production	…cash crop production	… non farm activities	… wage labor activities	…kid's education and health
	Ordered Probit						
Years of female employment	0.112**	0.071	0.212***	0.151***	0.068	0.112**	0.070
	(0.047)	(0.051)	(0.056)	(0.057)	(0.052)	(0.052)	(0.064)
Years of female employment - squared	-0.008**	-0.006	-0.014***	-0.010***	-0.005	-0.008*	-0.005
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Male spouse is employed	0.094	0.029	-0.177	-0.135	0.237	-0.108	0.190
	(0.132)	(0.137)	(0.173)	(0.186)	(0.149)	(0.134)	(0.177)
Age gap	0.028**	0.042***	0.046***	0.041***	0.026*	0.017	0.048***
	(0.012)	(0.014)	(0.013)	(0.015)	(0.014)	(0.012)	(0.018)
Female spouse age	0.001	0.002	-0.012	-0.009	-0.010	-0.005	-0.010
	(0.007)	(0.008)	(0.009)	(0.010)	(0.009)	(0.008)	(0.011)
Dependency ratio	-0.001	-0.001	0.0002	-0.001	-0.002*	-0.001	-0.0004
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education gap between spouses	-0.011	-0.017	0.048*	-0.009	-0.019	-0.002	0.007
	(0.020)	(0.020)	(0.025)	(0.028)	(0.020)	(0.020)	(0.028)
Female spouse is literate	-0.052	-0.169	0.112	-0.112	-0.111	0.030	0.176
	(0.164)	(0.183)	(0.214)	(0.236)	(0.182)	(0.170)	(0.225)
Male spouse is literate	-0.347**	-0.165	-0.154	0.049	0.107	-0.144	-0.229
	(0.169)	(0.176)	(0.200)	(0.220)	(0.171)	(0.165)	(0.222)
Pentecostal	0.820***	0.673**	0.868**	1.012***	0.995***	0.433	1.704***
	(0.304)	(0.309)	(0.377)	(0.343)	(0.326)	(0.343)	(0.444)
Catholic	-0.012	-0.090	-0.322	-0.074	-0.284	-0.281*	0.078
	(0.164)	(0.166)	(0.207)	(0.199)	(0.177)	(0.164)	(0.215)
Muslim	-0.125	0.266	-0.623*	-0.278	0.142	0.039	1.015**
	(0.284)	(0.318)	(0.330)	(0.353)	(0.354)	(0.299)	(0.451)
Traditionalist	0.940***	0.591**	0.464	0.504	0.489	0.848***	-0.091
	(0.292)	(0.280)	(0.340)	(0.353)	(0.363)	(0.313)	(0.430)
Distance to market	0.006	0.005	0.013	0.013	0.007	-0.00003	0.017
	(0.010)	(0.011)	(0.014)	(0.015)	(0.013)	(0.011)	(0.018)
Distance to health center	-0.033*	-0.020	-0.005	-0.029	0.002	-0.009	-0.027
	(0.019)	(0.021)	(0.022)	(0.023)	(0.021)	(0.019)	(0.027)
Distance to Accra	-0.001	0.0003	-0.0004	-0.0004	0.006	0.004	0.006
	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)
Eastern Region	-0.053	0.031	-0.028	-0.162	-0.104	-0.025	-0.100
	(0.233)	(0.224)	(0.298)	(0.334)	(0.262)	(0.214)	(0.323)
Central Region	0.516**	0.487**	0.703***	0.431*	0.290	0.578***	0.593**
	(0.217)	(0.218)	(0.236)	(0.251)	(0.218)	(0.206)	(0.263)
Volta Region	0.195	0.198	0.675	0.544	-0.533	-0.147	-0.433
	(0.618)	(0.645)	(0.727)	(0.799)	(0.659)	(0.613)	(0.853)
Constant	-1.364***	-1.738***	-1.725***	-1.794***	-1.677***	-1.587***	-0.435
	(0.468)	(0.503)	(0.552)	(0.622)	(0.552)	(0.470)	(0.665)
	-0.363	-0.557	-0.510	-0.613	-0.591	-0.459	
	(0.465)	(0.488)	(0.550)	(0.616)	(0.546)	(0.467)	
	0.160	0.016	0.235	0.058	0.220	0.377	
	(0.466)	(0.491)	(0.555)	(0.621)	(0.544)	(0.469)	
Observations	414	418	307	258	335	386	404

Standard errors in parenthesis. Significant effects are indicated with * (p<0.1), ** (p<0.05) and *** (p<0.01)

Chapter III. The role of Fairtrade certification for wages and job satisfaction of plantation workers

Abstract:

Worker welfare and employment conditions in the agri-food producing and processing sectors in the global south have become an increasing concern for consumers. Sustainability standards, such as Fairtrade, play an important role in agri-food markets of horticultural produce and may be a tool to address these concerns. However, so far the implications of Fairtrade certification for extrinsic and intrinsic employment factors of hired labor on large-scale plantations remain hardly understood. In this paper we assess its effect on workers' hourly wages and their level of job satisfaction with primary survey data from 325 randomly sampled workers from eight different export-oriented pineapple companies in Ghana. We apply a linear, linear mixed model and instrumental variable approach to take into account the multilevel characteristics of our data and possible selection bias. Our findings show that both hourly wages and job satisfaction are indeed higher on Fairtrade certified plantations. Factors of increased job satisfaction are likely driven by higher wages, permanent employment contracts, training opportunities, company services such as medical care and paid leave as well as established labor unions on Fairtrade certified plantations.

Keywords: Fairtrade certification, horticultural employment, worker wages, job satisfaction

JEL Codes: J28, J31, Q13

This chapter is co-authored by Miet Maertens and Meike Wollni. The author's contributions are as follows: KK, MM and MW designed the research. KK collected, analyzed, and interpreted the data. MM and MW assisted in the analysis and interpretation of the results. KK wrote the paper. MW commented and MM edited the final draft.

1. Introduction

Exports of high-value produce such as fresh fruits, vegetables and flowers from developing countries have increased tremendously in the past couple of decades. Developing countries' share in global high-value agri-food exports has nearly doubled from 23% in 1985 to 40% in 2005 (Maertens et al., 2012). Horticulture exports constitute between one fourth and one third of total agri-food exports from developing regions (Van den Broeck and Maertens, 2016). This led to the expansion of large-scale horticultural and floricultural estates and processing plants catering for the export market. Diversification into export horticulture, often fostered by foreign investments, has become a strategy for employment generation and increased foreign exchange earnings for many developing countries (Barrientos et al., 2003). Today, about 450 million workers are employed as casual, temporary or permanent workers on agricultural plantations for traditional cash crop production, like tea or coffee but also increasingly fresh fruits, vegetable and flower production (Hurst, 2007). The quality of jobs on export plantations has been questioned by a number of studies pointing to insecure, badly paid and hazardous jobs and risk of exploitation (Barrientos et al., 2003; Dolan, 2004; Riisgaard, 2009). Plantation workers are considered one of the most vulnerable groups in the global trade system as they are often exposed to discrimination, difficult working conditions and at the same time lack bargaining opportunities. In recent years however, consumers have become increasingly aware of unfavorable employment conditions in the food producing and processing industry. This awareness has been mirrored by the rise of private food and sustainability standards, such as Fairtrade. The Fairtrade movement is most well-known to support smallholder farmers with fair prices but it also supports plantation agriculture with the aim of empowering workers and economically develop their communities (Fairtrade International, 2014).

In this paper we analyze the implications of Fairtrade certification for low skilled workers on pineapple plantations in Ghana. As the pineapple export sector in Ghana experienced a recent shift from being partially smallholder based to being almost completely based on large-scale plantation production, the focus on workers in the sector is particularly pertinent. While there is a rather large literature on the implications of Fairtrade certification for smallholder farmers in various sectors, evidence on the implications of Fairtrade for plantation workers is very scarce. A handful of studies has analyzed the impact of Fairtrade on wages and workers' income (Cramer et al., 2014; Granville and Telford, 2013; Ruben and van Schendel, 2009) but few studies have looked beyond wages at other employment characteristics and job satisfaction – with the studies of Ruben and van Schendel (2009) and Raynolds (2012) as notable exceptions. In this paper we take a broader perspective by incorporating extrinsic as well as intrinsic factors of employment, and by investigating the impact of Fairtrade certification on wages as well as job satisfaction. More specifically, we address the

following two questions: (1) Does Fairtrade certification have a positive effect on wage levels of plantation workers and (2) Are workers on Fairtrade certified plantations more satisfied with their jobs?

2. Literature review

2.1. Conceptual arguments

We rely on exchange theory (Blau, 1964; Homans, 1958) and link it to Herzberg's two-factor theory of job satisfaction (Herzberg, 1966). Exchange theory is a prominent theory on social behavior that can be applied to understand job satisfaction. Exchange theory stipulates that individuals enter into social relationships with the expectation of rewards, benefits and remuneration. To ensure the fulfillment of these expectations, they are willing to invest effort, time, skills and education amongst other contributions. According to the two-factor theory of workplace satisfaction, rewards of employment can be either extrinsic and objective – including pay, job security and quality of leadership – or intrinsic and subjective – including variation of tasks, new skills development, autonomy, empowerment (Herzberg, 1966). Workers experience satisfaction from both extrinsic and intrinsic rewards of their job, which are determined by the characteristics of the job and the employment environment. Job satisfaction is determined by both extrinsic and intrinsic rewards, but is also regarded as an intrinsic reward in itself because it is related to the actual job activity of a worker.

Fairtrade certification can affect job satisfaction by influencing both the extrinsic and intrinsic rewards for workers. Fairtrade particularly emphasizes social equity, alternative trade arrangements, fair prices for producers and fair wages for hired workers. Fairtrade focuses on three main principles to improve employment conditions on plantations and support worker empowerment: (1) the management of a Fairtrade Premium through a joint body consisting of workers and management, (2) freedom of association and collective bargaining, and (3) fair working conditions, including fair wages and the implementation of health and safety measures (Fairtrade International, 2014). The application of these principles is a list of Fairtrade requirements – marked out as core requirements and development requirements – which certified plantations must adhere to (see appendix table A.8 for an overview of the requirements). These principles and requirements can affect job satisfaction in a number of ways. To begin with, we discuss several channels through which Fairtrade certification may affect extrinsic rewards. Firstly, Fairtrade regulations stipulate the implementation of either an official minimum wage or if absent a regional average wage. From 2014 onwards, Fairtrade International has revised its requirements and now promotes a so-called living wage, which is established by the organization itself based on the costs of living in a particular setting. Fairtrade

certified companies are now required to remunerate their employees according to the living wage if the minimum wage is lower. Secondly, Fairtrade companies may ensure permanent work contracts to the majority of their workers, specifically in the pineapple sector where produce is harvested all year round. Further, produce sold into the Fairtrade market receives a minimum and stable price – independent of the world market price. Fairtrade companies also engage in long-term relationships with importers usually enforced through contracts. The ability to rely on prices and trading relationships enables companies to plan ahead also regarding their workforce. Thirdly, working conditions and company services including paid leave, access to appropriate health care and the provision of social security are regulated in Fairtrade requirements.

Fairtrade certification may influence intrinsic rewards for workers as well. Firstly, the provisions of trainings are required for Fairtrade companies. These provide workers with opportunities to grow in terms of skills and education. Secondly, Fairtrade certification strongly emphasizes collective bargaining and the empowerment of workers through strict regulations regarding labor union formation and collective agreements between the workforce and the company. Workers are further to be members of the so-called Fairtrade Premium Committees. The Committees are responsible for the management of the additional Fairtrade Premium that producers automatically receive from their exporter or importer when selling a Fairtrade product. The workers together with the company decides and votes upon the use of these available funds for the implementation of educational, health or other social projects to benefit those involved in the goods production.

2.2. Empirical evidence

Some studies have analyzed the implications of standards such as GlobalGAP and Ethical Trade Initiative towards specific rewards of employment on export plantations. These studies mostly point to positive effects on employee training, labor organizations and employment security but not necessarily on wages (Barrientos et al., 2003; Colen et al., 2012; Ehlert et al., 2014; Gibbon and Riisgaard, 2014; Nelson and Pound, 2009). Schuster and Maertens (2017, 2016) find that the adoption of private labor standards (including Fairtrade) in the Peruvian horticultural export sector results in a higher likelihood for workers to receive the minimum wage, more job security and more employee trainings as well as improved worker empowerment; which implies these standards contribute to both extrinsic and intrinsic rewards.

Insights from studies on Fairtrade in particular are diverse. Granville and Telford (2013) point out that Fairtrade workers in the wine industry in South Africa earn salaries above the minimum wage. A study by the “Fairtrade, Employment and Poverty Reduction” project from the University of London does not find evidence for higher wages or better working conditions through Fairtrade certification

on small farms and large estate units in the tea, coffee and flower sectors in Uganda and Ethiopia (Cramer et al., 2014). These studies focus on specific extrinsic rewards. There are very few studies looking at more intrinsic rewards or overall job satisfaction, likely because these are more subjective and more difficult to measure. Based on evidence from the Ecuadorian flower sector Raynolds (2012) concludes that Fairtrade benefits for workers particularly lie in the ability to empower them and secure their well-being at work. To the best of our knowledge, there is only one study that specifically assesses the implications of Fairtrade certification for worker job satisfaction. Ruben and van Schendel (2009) compare workers on a Fairtrade certified banana plantation with workers on a non-certified one. They do not find significant differences in job satisfaction between these workers. Workers on the non-certified plantation are found to receive a higher salary but also to work longer hours and receive less non-monetary benefits. A potential drawback of this study (and other studies on Fairtrade and workers) is that the data comes from only one certified and one non-certified company, which makes it more difficult to disentangle the effect of Fairtrade certification from other company characteristics. In this study, we use data from workers on several certified and non-certified companies to assess the implications of Fairtrade certification for wages and job satisfaction. This is possible because of the large size of the Ghanaian pineapple sector and allows to better control for other company characteristics.

3. Background and data

3.1. Research area

Pineapple is Ghana's 6th most important export crop with fresh and processed pineapple exports amounting to 51 Million USD in 2011 (Gatune et al., 2013). Pineapple was introduced in Ghana in the 1980s and first produced by smallholder farmers. With rising demand from Europe, large-scale pineapple farms established close to the shipping port and airport (Fold and Gough, 2008). In the 1990s, Ghana was the 3rd most important pineapple supplier to the European Union after Cote d'Ivoire and Costa Rica. The dominant variety was "Smooth Cayenne" and exports were realized by both smallholder farmers and large-scale plantations. In the late 1990s, Fresh Del Monte developed a new variety called MD2, the so-called "shipping pineapple" with much longer shelf-life. Its expansion in Costa Rica and other countries, coupled with vast marketing campaigns in the United States and Europe, ultimately changed consumer taste in favor of the new variety and caused a drop in international market prices. MD2 is regarded as an industrial crop for large-scale mechanized production as it requires fertilizer, pesticides, plastic mulching and cooling facilities, and therefore larger and continued capital investments. Ghanaian smallholder producers were unable to adapt to the quick change due to information and capital constraint and dropped out of export production. This led to a decline in the EU market share from 10.5% in 2003 to 4.3% in 2007 (Fold and Gough,

2008; Harou et al., 2017; Kleemann et al., 2014) and a shift in export production from smallholders to large-scale industrial plantations.

Today, about 15 large-scale plantations produce pineapples for the export market, of which eight are responsible for 93% of Ghana's fresh pineapple exports. Smallholder farmers predominantly sell to the local market or to processors. All plantations are GlobalGAP certified and approximately 40% have an additional Fairtrade certification. This provides an interesting context to study the implications of Fairtrade certification for workers.

3.2. Data

Our study focuses on the so-called Ghanaian pineapple belt, which is the central area for pineapple production stretching across the Central Region, the Eastern Region, the Greater Accra Region and the Volta. Data were collected from two sources. First, in November 2014 we implemented semi-structured interviews with main stakeholders in the pineapple export sector, including representatives from agricultural ministerial divisions at the central and district level, the association of sea-freight pineapple exporters of Ghana, foreign aid agencies, and management boards from pineapple producing and processing companies. Second, we collected original survey data from 361 hired plantation workers and their households between April and July 2015. We purposively selected eight pineapple companies, four (out of the six) Fairtrade certified companies and four (out of the nine) Non-Fairtrade certified companies. All selected companies are GlobalGAP certified as all companies in the sector are. Fairtrade companies are generally larger in terms of the area, the number of workers and the export volumes and more often include foreign investment and management than Non-Fairtrade companies (see appendix table A.9 for an overview of the companies). In order to create the best comparison, we selected the four smallest Fairtrade companies and four Non-Fairtrade companies that best match these in terms of size and foreign management. From the selected companies we obtained lists of villages they recruit laborers from and from these villages we obtained lists of people working as wage laborer on the pineapple plantations. From this sampling frame of all workers employed by the sampled pineapple plantations, we randomly selected 30 to 50 workers per company. The survey was implemented through face-by-face interviews with a team of local field assistants. Our total sample includes 361 workers but for this paper we restrict the total sample of 361 workers to a subsample of 325 workers (166 workers in Fairtrade companies and 159 in Non-Fairtrade companies) only including manual or low skilled laborers and excluding management, administrative and technical personnel. In this paper, we refer to companies that are Fairtrade certified as "Fairtrade companies" and their employees as "Fairtrade workers". Companies that do not comply with Fairtrade certification are called "Non-Fairtrade companies" and the workers on those plantations "Non-Fairtrade workers".

4. Descriptive analysis

4.1. Company characteristics

The sampled pineapple companies, including four Fairtrade and GlobalGAP certified and four GlobalGAP-certified companies, use on average 270 hectares for pineapple production and employ on average 230 workers. Despite our strategy to sample the most similar companies, Fairtrade companies are significantly larger than Non-Fairtrade companies in terms of the area of production and the workers employed (table 7). On average the Fairtrade companies have been Fairtrade certified for 2 to 14 years. Three of the Fairtrade companies sell approx. 30% of their produce into the Fairtrade market; the fourth about 60%. The remainder, although produced under Fairtrade requirements, is sold as conventional produce. The Fairtrade Premium companies receive for social projects are on average approx. 40.000 Euro per year. So far, none of the companies has taken up the new possibility to use this premium to pay out bonuses in cash to employees. Both Fairtrade and Non-Fairtrade companies apply a salary scale set up in accordance to various factors such as punctuality, target achievements, daily appearance at work, quality assurance etc.

Table 7 Overview of the selected companies for the survey

Variable	**Fairtrade company**		**Non-Fairtrade company**		Difference and Test statistics
N (8)	Mean value	Std. deviation	Mean value	Std. deviation	
Size of the company in hectares [a]	338	122.32	190	58.31	148*
Size of the company in worker numbers [a]	347.50	112.66	148.50	48.12	199**
Productivity level in metric tons per week [a]	165	107.55	79	55.53	86

a Variable is continuous and has been tested with a t-test
* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

4.2. Worker characteristics

Table 8 provides a mean comparison of the demographic characteristics of Fairtrade and Non-Fairtrade workers and their households. Similarities are particularly found with regard to certain socio-demographic characteristics, such as religion and living conditions as well as the level of income generation apart from horticultural wage labor. The computation of an asset index[7] shows that Fairtrade workers have a higher number of assets than Non-Fairtrade workers. Further, Fairtrade workers are on average 2.08 years older and have more dependents (children below the age of 18 and/ or adults above the age of 65 living in the household) to care for. Non-Fairtrade workers show slightly better education levels with a higher number of workers being at least secondary school graduates and a fewer share with no formal education at all. Literacy rates are nonetheless comparable across all workers.

Table 8 also presents information on household income and income sources – differentiating between (1) income from horticultural wage employment, (2) income generated on own agricultural land, (3) income from self-employment (such as tailoring, shop keeping or hair dressing etc.), (4) income from off-farm wage employment as well as (5) additional incomes from pensions, gifts and others. Fairtrade workers have a higher total and per adult equivalent household income than Non-Fairtrade workers. While the different income sources are equally important for both types of workers, the income from horticultural wage labor is significantly higher for Fairtrade workers than for Non-Fairtrade workers. Contributing about 60% to total household income, it is the main income source for workers and their households.

[7] The asset index was computed with the Principle Component Analysis approach.

Table 8 Summary statistics of worker and household characteristics

Variable	Worker in a **Fairtrade company**		Worker in a **Non-Fairtrade company**		Difference and Test statistics
	Mean value	Std. deviation	Mean value	Std. deviation	
Household Demographics					
Number of workers in Household [a]	1.49	0.61	1.36	0.49	0.14**
Number of workers on pineapple plantations in Household [a]	1.23	0.47	1.10	0.30	0.13***
Female Household Head [b]	0.23		0.28		0.04
Number of dependents [a]	2.52	1.54	1.97	1.43	0.55***
Protestant [b]	0.85		0.86		0.01
Catholic [b]	0.03		0.06		0.03
Muslim [b]	0.04		0.02		0.02
Worker Demographics					
Female worker [b]	0.62		0.61		0.01
Worker is married [b]	0.81		0.67		0.13***
Worker is literate [b]	0.46		0.50		0.04
Worker did not go to school [b]	0.33		0.15		0.17***
Worker finished primary school only [b]	0.23		0.23		0.01
Worker finished secondary school or higher [b]	0.44		0.62		0.18***
Age of Worker (years) [a]	38.51	9.10	36.07	10.46	2.44**
Living conditions					
Number of rooms [a]	1.90	1.27	1.91	1.42	0.03
Electricity [b]	0.86		0.78		0.08*
Earthen floor [b]	0.17		0.11		0.06
Access to improved sanitation [b]	0.24		0.19		0.06
Clean drinking water [b]	0.88		0.69		0.19***
Total agricultural land [a]	1.02	1.35	0.98	1.22	0. 04
Standardized Asset Index [a]	22.47	17.45	15.77	16.95	6.70***
Household Incomes (in Ghana Cedi)					
Total income [a]	5720.05	5951.88	4068.02	3272.86	1652.03***
Total income per adult equivalent [a]	2064.96	2843.07	1615.45	1236.11	449.51*
(1) Horticultural wage labor income [a]	3116.36	1339.32	2602.60	1101.19	513.76***
(2) Agricultural income [a]	960.99	3734.57	559.20	2808.91	401.79
(3) Self-employment income [a]	720.98	1580.82	584.78	1449.81	136.20
(4) Other wage labor income [a]	573.25	2441.30	264.60	1306.67	308.65
(5) Other income [a]	75.12	287.77	56.82	155.66	18.30
N (325)	*N (166)*		*N (159)*		

a Variable is continuous and has been tested with a t-test
b Variable is bivariate and has been tested with a Wilcoxon-Mann-Whitney test
* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

4.3. Employment characteristics

Summarizing horticultural employment characteristics, table 9 shows, that daily working hours are similar across groups. Fairtrade workers work fewer hours per month, which can also be attributed to the average of 23 days of paid leave per year granted to Fairtrade workers in comparison to the 5 leave days for Non-Fairtrade workers. The descriptive data further shows that Fairtrade workers are more likely to have a permanent employment status (87%) than Non-Fairtrade workers (53%). This may also be the reason for a much longer time of employment for Fairtrade workers, who at the point of interview have been working on average 7.27 years at their particular company in comparison to 3.70 years for Non-Fairtrade workers. With our sample we cannot confirm that wage employment on pineapple plantations is associated with casual employment by young and short-term workers, as is often put forward for high-value plantation agriculture. We calculate an average hourly wage for each worker based on data on monthly wage payments, the number of hours worked per day, and the number of days worked per month. We see that Fairtrade workers receive higher hourly wages overall and in almost all work categories. With an average daily wage of 10.10 Ghana Cedi on Fairtrade plantations and 9.22 Ghana Cedi on Non-Fairtrade plantations, wage levels are on average above the daily minimum in Ghana of 7 Ghana Cedi.

There are several services provided by all companies. Transport is often organized as are medical check-ups for workers either on-site or in cooperation with a local health facility. Fairtrade companies seem to have better social allowances and loan provisions, which may partly be funded by the Fairtrade Premium. Qualitative data shows that Non-Fairtrade companies differentiate between permanent and casual workers, which may be reflected in the access to services. As table 9 shows, many Non-Fairtrade workers do not have a permanent employment status. Furthermore, Fairtrade workers participate in a higher number of trainings, contributing to their educational capital. Labor union membership is also more pronounced in Fairtrade companies with 73% of their workers being a member of a labor union and only 45% of the Non-Fairtrade workers.

Table 9 Summary statistics of variables concerning horticultural employment

Variable	Worker in a **Fairtrade company**		Worker in a **Non-Fairtrade company**		Difference and Test statistics
	Mean value	Std. deviation	Mean value	Std. deviation	
Employment conditions					
Working months per year [a]	11.45	1.42	11.28	1.92	0.169
Working days per month [a]	21.28	4.73	22.36	3.52	1.075**
Working hrs per day [a]	7.98	2.15	8.14	1.62	0.169
Average hrs overtime per week [a]	1.33	2.60	1.44	2.53	0.115
Permanent employment status [b]	0.87		0.53		0.338***
Years of employment [a]	7.27	4.37	3.70	3.76	3.567***
The overtime rate is higher than the normal wage rate [b]	0.75		0.63		0.113*
Yearly extra bonus (in Ghana Cedi) [a]	81.52	107.74	63.67	90.17	17.851
Worker takes leave [b]	0.88		0.19		0.691***
Days of paid leave to be taken per year [a]	22.96	7.55	4.87	9.76	18.09***
Labor union membership (if there is a labor union present at the company) [b]	0.73		0.45		0.273***
Received training within last 12 months [b]	0.47		0.16		0.306***
Nr of trainings received within last 12 months [a]	1.70	2.86	0.40	1.44	1.296***
Hourly wages in the different activity sectors					
Daily salary (in Ghana Cedi) [a]	10.10	6.02	9.22	4.18	1.734***
Hourly salary (in Ghana Cedi) [a]	1.54	1.39	1.17	0.61	0.376***
Packaging, Export, Processing [a]	1.18	0.42	1.18	0.64	0.003
Field preparation and maintenance [a]	1.73	1.21	1.09	0.38	0.643***
Planting and Harvesting [a]	1.43	0.74	1.17	0.62	0.259
Chemical application [a]	1.80	0.85	1.23	0.36	0.573*
Sucker management [a]	2.04	2.65	1.11	0.26	0.937
Other menial jobs (cleaning, security etc.) [a]	1.03	0.31	1.14	0.29	0.111
Company services used					
Lunch [b]	0.21		0.28		0.072
Transport [b]	0.49		0.70		0.210***
Medical care for worker on site [b]	0.64		0.35		0.293***
Medical care for worker off site [b]	0.59		0.40		0.188***
Medical care for family off site [b]	0.06		0.006		0.054***
Social allowances (for funerals etc.) [b]	0.07		0.01		0.054**
Loan [b]	0.24		0.05		0.191***
N (325)	*N (166)*		*N (159)*		

a Variable is continuous and has been tested with a t-test
b Variable is bivariate and has been tested with a Wilcoxon-Mann-Whitney test
* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

4.4. Job satisfaction

We measure job satisfaction based on multiple questions concerning satisfaction of different aspects of the job. Most studies on job satisfaction consider a single-item question "How do you feel about your job?" and thereby assume that workers are able to jointly consider all aspects of their job to make an overall assessment of job quality. We therefore apply a different approach and asked a set of questions regarding overall job satisfaction as well as organizational identification and climate. These questions were based on various studies in these fields from Andrews and Withey (1976) and Menon (2001). The full overview of questions, that have been adapted both to the local as well as to the working context asked, can be found in the appendix table A.10. We apply a Principle Component Analysis (hereafter PCA) to group individual variables according to their degree of correlation and relation. This is done via the transformation of correlated variables into a new set of uncorrelated components using a covariance matrix. Weights are applied via factor loadings to generate a component that explains the majority of the variance amongst the job satisfaction variables. We apply specific tests (Cronbach's alpha, Kaiser-Meyer-Olkin measure and Bartlett test of sphericity) to ensure the suitability of variable use within the PCA. For easier interpretation we calibrate the job satisfaction score on a 0 to 100 scale. In table 10 we compare the overall job satisfaction score but also take a closer look at the differences across the individual variables of the job satisfaction score component. Table 10 shows, Fairtrade workers have a higher overall job satisfaction score and show much higher satisfaction levels when it comes to different conditions at the employment level (co-workers, provisions, supervisors etc.). They also confirm higher levels of company identification and positive company climates. The individual indicators of job satisfaction are measured on a Likert scale from 1 to 5 as described in appendix table A.10.

Table 10 Mean comparison of workers' satisfaction for individual factors of job satisfaction, organizational identification and employee empowerment

Variable	Worker in a **Fairtrade company**		Worker in a **Non-Fairtrade company**		Difference and Test statistics
	Mean value	Std. deviation	Mean value	Std. deviation	
Job satisfaction score [a]	63.26	18.91	52.15	22.41	11.10***
General job satisfaction [a]	3.34	1.07	2.83	1.08	0.508***
Job satisfaction: co-workers [a]	3.97	0.75	3.69	0.90	0.280***
Job satisfaction: work itself [a]	3.33	1.04	2.99	1.15	0.344***
Job satisfaction: environment & conditions [a]	3.51	0.97	3.11	1.10	0.404***
Job satisfaction: provisions [a]	3.77	0.96	3.30	1.18	0.474***
Pride to be an employee at company [a]	3.62	1.02	3.13	1.14	0.487***
Right company choice [a]	3.50	1.06	3.00	1.10	0.494***
Company cares for employees [a]	3.18	1.11	2.66	1.08	0.518***
Company is fair towards employees [a]	3.24	1.20	2.79	1.18	0.451***
N (325)	*N (166)*		*N (159)*		

a Variable is continuous and has been tested with a t-test
* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

5. Model specification and econometric analysis

We first apply a linear regression model as follows:

(1) $$y_i = \alpha_0 + \alpha_1 \mathrm{FT}_j + \alpha_2 \mathrm{c}_j + \alpha_3 \mathrm{x}_i + \varepsilon_{ij}$$

The outcome variables of interest (y_i) are (1) individual hourly wage in log and (2) worker job satisfaction – and we estimate separate models for these two outcome variables. The outcome variable is a function of the main variable of interest for Fairtrade certification FT_j of the company, other company level characteristics c_j and a vector x_i of worker level characteristics including demographics. As control variables we consider variables used in previous research related to horticultural wage employment and the role of certification (Ehlert et al., 2014; Schuster and Maertens, 2017; Schuster and Maertens, 2016). The treatment dummy FT_j takes a value of one if the pineapple plantation is Fairtrade certified and zero if otherwise. We account for factors of efficiency and productivity of the company c_j in terms number of workers, plantation size of the company in hectares and company capacity in output per week. Worker characteristics include the gender of the worker, education level, age, job and pineapple production experience as well as the type of job performed on the plantation. ε is a random error term.

We extend the linear model to take into account the multilevel nature of the data at worker and company level. Workers are employed in eight different companies and wages within a company are likely more correlated than wages across companies, leading to correlation in the error term. To

account for this, we apply a linear mixed model with the combination of fixed and random effects. This relaxes the assumption of no linear dependence in the error term as in the linear model. This means we add random effects to the fixed effects in our model, which characterize the idiosyncratic variation due to individual company differences.

(2) $$y_i = \alpha_0 + \alpha_1 \mathrm{FT}_j + \alpha_2 \mathrm{c}_j + \alpha_3 \mathrm{x}_{ij} + \gamma_{0j} + \varepsilon_{ij}$$

Where γ_{0j} is the random deviation from the intercept α_0

α_1, α_2, α_3 are "fixed" slope parameters of the explanatory variable (FT_j), company level variables (c_j) vector (x_{ij}) for worker *i* = 1, …, n_i in company *j* = 1, …, m

Estimates may be biased because of unobserved heterogeneity at the company and the worker level. First, companies that become Fairtrade certified may differ from companies that chose not to become Fairtrade certified. While we are able to control for certain observed characteristics of the companies in the vector c, we cannot account for unobservables such as altruism of the management, social conscience, sense of responsibility for community development and other unobservable characteristics that might be correlated with both Fairtrade certification and the outcome variables of interest. Interviews with company management have revealed that Fairtrade certification is not regarded a sign of altruism but rather an important marketing choice. They regard Fairtrade as a tool to raise their standard and quality of production. While GlobalGAP certification is perceived as mandatory to be able to export to the European Union, Fairtrade certification provides an entry pathway into a particular niche market, that other export countries do no target. It is possible however, that we measure more of a "general attitude" of Fairtrade companies than necessarily the certification effect specifically. The linear mixed model addresses the problem of endogeneity of our explanatory variable to a certain extent. The random intercepts in the linear mixed model can be interpreted as effects of omitted covariates and therefore account for unobserved heterogeneity (Fahrmeir et al., 2013). Second, workers who seek employment in Fairtrade companies may be inherently different regarding their motivation. In rural Ghana, the freedom to choose a work place is often restricted due to distances and access to transport. In reality therefore, workers choose their work places mainly based on proximity to their village and vice versa companies source the majority of their workers from villages surrounding their estate units. To reduce potential bias from unobserved heterogeneity at the worker level, we apply an instrumental variable approach with a distance measurement as instrument. Our instrumental variable model is as follows:

(3) $$y_i = \alpha_0 + \alpha_1 \mathrm{FT}_j + \alpha_2 \mathrm{c}_j + \alpha_3 \mathrm{x}_i + \varepsilon_{ij}$$

(4) $$\mathrm{FT}_j = \delta_1 \mathrm{FTD} + \delta_2 \mathrm{x}_i + \varepsilon_i$$

We define the instrumental variable (*FTD*) as a dummy variable of whether the next Fairtrade company is located within a 5km radius of the village. We chose this instrumental variable based on the arguments above. Distance plays a major role in the choice to take up wage labor due to limited mobility. This is also reflected in the high correlation with the endogenous variable (correlation = 0.53***). The suitability of the variable as an instrument is confirmed through a weak instrument test (chi2 = 67.38***). In the first stage (see appendix table A.11) we include socio-demographic characteristics of the worker to account for self-selection into Fairtrade certified plantations.

6. Results

6.1. Hourly wage

The results in table 11 show that Fairtrade certification positively and significantly correlates with hourly wages of hired labor. All models show that hourly wages are more than 30% higher for Fairtrade workers than for Non-Fairtrade workers. Estimated coefficients on Fairtrade certification are slightly higher in the linear mixed model (35%) and the IV model (43%), in which unobserved company heterogeneity and self-selection into certification is better accounted for - than in the OLS regression model (32%). Other company level characteristics also influence wage levels, such as the size of a company which is here proxied by the number of workers employed as well as the production capacity of a company. These findings confirm the assumption that more productive companies are better able to provide fair wages due to their business success. However the company size does not necessarily have the same implications as can be seen by the negative sign of the coefficient. The scales of these effects are very small however. We account for the different types of jobs in comparison to field management and maintenance, which is used as the baseline for the different types of jobs as it represents the sector with most overall workers. The worker experience does not play an important role in the determination of worker wage. Neither those that have previous employment experience in the pineapple sector nor those that grow pineapple themselves, have a higher wage than others. In the linear mixed model, the results are confirmed with slightly less statistical significance for Fairtrade certification.

Both the Wald test and the likelihood-ratio test confirm that the random-intercept model provides a better model fit than a linear regression model. The Hausman test does not confirm correlation between random effects and covariates, so using the linear mixed model is suitable. However, the intraclass correlation coefficient shows low correlation within clusters. The instrumental variables approach confirms the results of the other models. Here, we can reject the null hypothesis of no correlation between the treatment errors and the outcome errors within the IV model. Appendix table A.11 presents the results from the first stage regression of the IV approach.

Table 11 Regression results on the hourly wages of hired labor

Variable	OLS regression model		Linear mixed model		IV regression model	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Fairtrade certification	0.319***	(0.0804)	0.348**	(0.154)	0.434***	(0.131)
Number of workers	-0.000989**	(0.000465)	-0.000976	(0.000876)	-0.00117**	(0.000480)
Plantation size of company	-0.000342	(0.000286)	-0.000341	(0.000544)	-0.000414	(0.000287)
Company capacity	0.00137***	(0.000477)	0.00129	(0.000897)	0.00164***	(0.000522)
Female worker	-0.0242	(0.0502)	-0.0133	(0.0477)	-0.0247	(0.0494)
Education	0.0324	(0.0481)	0.0543	(0.0470)	0.0436	(0.0484)
Age	-0.00386*	(0.00232)	-0.00175	(0.00227)	-0.00449*	(0.00235)
Job experience	0.0505	(0.0767)	0.0430	(0.0725)	0.0389	(0.0762)
Pineapple experience	0.0419	(0.0783)	0.0501	(0.0747)	0.0152	(0.0808)
Planting	-0.00875	(0.0648)	0.0176	(0.0624)	-0.0152	(0.0635)
Export	-0.110	(0.0670)	-0.123*	(0.0642)	-0.116*	(0.0657)
Chemicals	0.0944	(0.0827)	0.0943	(0.0782)	0.0933	(0.0807)
Sucker management	0.0643	(0.0748)	0.0683	(0.0710)	0.0643	(0.0730)
Others	-0.120	(0.0916)	-0.0836	(0.0869)	-0.120	(0.0894)
Constant	0.318**	(0.128)	0.192	(0.171)	0.315**	(0.126)
			-2.283***	(0.340)		
			-1.026***	(0.0398)		
	N = 325 F (14, 310) = 3.96 Prob>F = 0.000 R-squared = 0.152 Adj R-squared = 0.114 Root MSE = 0.380		N = 325 No. of Groups = 8 Wald chi^2 (14) = 26.83 Prob>chi^2 0.0203 LR Test = 0.0005		N = 325 Wald chi^2(14) 35.92 Prob>chi^2 0.001 LR test of indep. Eqns. (rho=0) Prob>chi^2 0.276	

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

6.2. Job satisfaction

Looking at the regression results for job satisfaction in table 12, we find the different approaches to result in comparable point estimates and similar statistical significance levels. The likelihood ratio test reveals that the linear mixed model does not provide a better fit than the OLS model. This may be due to the fact, that our variable of interest is a subjective measure and therefore much more a personal perception and less related to company characteristics. The results show that Fairtrade certification is significantly positively correlated with job satisfaction. The company's production capacity has a negative effect on job satisfaction. The reasons may be related to a higher demand for workers' flexibility and effectivity and increased pressure for workers' performance. Other significant factors are worker age and the specific jobs on the plantation. Older workers are happier with their job, possibly because of the limited work opportunities for people of older age particularly in the context of rural Ghana. Having a (potentially) permanent employment status might contribute to a feeling of secure income generation. Workers engaged in export related activities are unhappier with

their job. A reason may be that people working in packaging, processing and export are overall less flexible with their working hours. If a deadline is in place to supply to a specific flight or shipping vessel, the produce has to be ready. The pressure to finalize the task and the longer working hours this may entail, is potentially higher here than in other sectors. Field management in comparison is much more task-based, where workers are allowed to finish their workday after his/ her task is completed. Activities such as planting and sucker management may be more physically demanding than other sectors, leading also to lower levels of job satisfaction.

Table 12 Regression results for job satisfaction score

Variables	OLS regression model		Linear mixed model		IV model	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Fairtrade certification	17.15***	(4.266)	16.99***	(4.788)	16.18**	(7.326)
Number of worker	0.0149	(0.0246)	0.0165	(0.0275)	0.0164	(0.0258)
Size of company (ha)	-0.0170	(0.0152)	-0.0180	(0.0170)	-0.0164	(0.0153)
Company capacity	-0.0596**	(0.0253)	-0.0614**	(0.0282)	-0.0619**	(0.0284)
Female worker	4.254	(2.686)	4.300	(2.619)	4.260	(2.623)
Education	1.910	(2.546)	1.395	(2.503)	1.816	(2.552)
Age	0.377***	(0.126)	0.372***	(0.124)	0.382***	(0.127)
Job experience	-1.379	(4.120)	-1.536	(4.009)	-1.288	(4.062)
Pineapple experience	1.859	(4.139)	2.364	(4.038)	2.086	(4.279)
Planting	-7.420**	(3.474)	-6.922**	(3.396)	-7.375**	(3.404)
Export	-8.365**	(3.574)	-7.903**	(3.489)	-8.319**	(3.501)
Chemicals	5.342	(4.399)	5.515	(4.280)	5.340	(4.295)
Sucker management	-4.536	(3.963)	-4.431	(3.862)	-4.540	(3.869)
Others	2.191	(4.846)	2.304	(4.721)	2.192	(4.731)
Constant	42.45***	(6.870)	42.71***	(7.065)	42.48***	(6.712)
			0.595	(1.395)		
			2.971***	(0.0405)		
	N 321		N 321		N = 321	
	F(14,306) 4.17		No. of Groups 8		Wald chi^2(14) 46.61	
	Prob>F 0.000		Wald chi^2(14) 51.22		Prob>chi^2 0.0012	
	R-squared 0.1601		Prob>chi^2 0.000		Wald test of indep. Eqns.	
	Adjusted R-squared 0.122		LR Test 0.3418		(rho=0) Prob>chi^2 0.872	
	Root MSE 20.06					

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

7. Discussion

Our results reveal that Fairtrade certification of large-scale pineapple plantations in Ghana has contributed to the job satisfaction of plantation workers and improved both the extrinsic and intrinsic rewards of employment on a pineapple plantation. We find that hourly wages are up to 40% higher in Fairtrade companies. This is not necessarily in line with what has been found so far. Both Ruben and van Schendel (2009) and Cramer et al. (2014) find no evidence for higher wages on Fairtrade certified large-scale plantations. Granville and Telford (2013) find that Fairtrade workers earn salaries above the minimum wage. Our data from Ghana shows that in both types of companies,

Fairtrade certified and non-certified companies, wages are higher than the minimum wage set by the government. Despite wages in the whole sector being above the minimum wage, wages in Fairtrade certified companies are still about 40% higher than wages in non-certified companies. This points to a rather strong positive impact of Fairtrade certification of plantations on the wages workers earn. We believe that this effect is more related to Fairtrade stimulating good labor practices in certified companies than to the price premium and bonus system included in Fairtrade certification trickling down to workers. From company interviews we know that companies do not make use of the possibility to return the Fairtrade bonus they receive at the end of the season to their workers as wage top-up payments. In addition, the interviews revealed that Fairtrade certified pineapple companies in Ghana sell on average only 40% of their produce on the Fairtrade market; the remainder of produce, that satisfies all Fairtrade criteria, is sold in the conventional market. Companies hence receive a Fairtrade price premium for only part of their Fairtrade certified produce. It is likely – but remains unclear from our analysis – that the effect of Fairtrade on wages would be even higher if a higher share of Fairtrade certified produce would find an ultimate Fairtrade destination.

Apart from wages, other extrinsic rewards are found to be higher for workers in Fairtrade companies and may be equally important for higher job satisfaction. Almost 90% of Fairtrade workers are permanently employed, which results into longer duration of employment. The stability of working arrangements might be important for worker job satisfaction as it contributes to secure income generation and long-term planning options. Other extrinsic rewards that are found to be higher for workers in Fairtrade companies include more days of paid leave per year, improved access to on-site and off-site provision of medical care for the workers, and increased availability of loans. Some of these services, such as paid leave and access to medical care, follow directly from Fairtrade requirements. Improved access to loans follows from Fairtrade companies using the Fairtrade Premium, generated through selling produce in the Fairtrade market, to offer workers credit at more interesting conditions than credit from local banks.

Also intrinsic rewards may contribute to higher levels of job satisfaction. Descriptive statistics also show that almost 50% of the Fairtrade workers participated in at least one training within the past 12 months. On average they received 1.7 trainings in comparison to 0.4 of trainings received by Non-Fairtrade workers. More qualitative data shows that workers indeed appreciate trainings and the ability of knowledge gain even though they feel they are only able to use the information on the plantation and not necessarily at home or their own farm. Also worker empowerment fostered through labor unions and Fairtrade Premium Committees may contribute to higher job satisfaction scores. Fairtrade regulations stipulate the establishment of a labor union to promote collective

bargaining of the workforce. The majority of Fairtrade workers are therefore also engaged in the labor union. Labor union membership potentially enables the individual workers to establish closer ties to co-workers and therefore feel as part of an entity. Labor unions represent the work force within a particular company and aim to improve wages, working conditions and employment factors for the workers. Contributing to this effort may increase the feeling of being empowered and able to direct wishes and demands of those employed. When it comes to the role of labor unions, our findings support the existing Fairtrade literature on implications for small-scale farmers. Studies have found Fairtrade to strengthen producer organizations and their ability for collective action and bargaining power (Bacon, 2005; Jaffee, 2007; Ronchi, 2002). We can see that this also plays a role for plantation workers, where labor union membership can contribute to strengthening workers' role in company decision-making. Raynolds (2012) confirms this also for flower workers in a quantitative study, identifying Fairtrade worker committees as a major pathway of empowerment. Also the process of fairly selecting and allocating the Fairtrade Premium towards village projects may be a pathway of empowering workers. For workers to take over responsibility regarding their community development strengthens their voice and decision-making ability.

Our findings further contribute to the understanding of what determines job satisfaction in labor-intensive agricultural sectors in developing countries. The empirical literature on job satisfaction in the context of developing countries is rather thin and is not directly linked to Fairtrade certification. Mulinge and Mueller (1998) assess job satisfaction of agricultural extension workers in Kenya and find that intrinsic rewards (upward communication, job variation) are more important than extrinsic rewards (resource adequacy, job security and promotional opportunities) for job satisfaction. Staelens et al. (2016) conclude that job satisfaction in the floricultural sector in Ethiopia is mainly driven by organizational extrinsic rewards such as wages, job security and bonus payments. These findings are in line with the assumption that skilled workers – as in the extension sector in Kenya - pay more attention to intrinsic rewards at their workplace, such as responsibility, recognition and opportunities for advancement while for low skilled workers extrinsic rewards are more important than intrinsic rewards. Given that the sampled workers in the Ghana pineapple sector are low skilled workers, our findings on Fairtrade improving overall job satisfaction is likely driven to a large extent by the effect Fairtrade has on wages and other extrinsic rewards.

8. Conclusion

The expansion of large-scale horticultural and floricultural estate farms in developing countries has led to structural changes in surrounding areas. As production is mainly export-oriented the demand for certification has led to significant adoption rates to be able to access particular markets. So far there is little research that deals with the potential implications of certification for hired laborers on

these large-scale plantations. Fairtrade as a prominent sustainability standard is particularly interesting when assessing working conditions, worker empowerment and fair wages as Fairtrade focuses on these provisions while others often only incorporate minimum requirements. In line with the exchange theory on social behavior, we use complimentary measures to acquire a more complete picture of Fairtrade's implications for workers' extrinsic and intrinsic employment factors. In this study, we find that Fairtrade can indeed have a positive effect on two measures that were evaluated here: hourly wages are higher for Fairtrade workers and they are more satisfied with their job.

In terms of comparability to other case studies, the set-up of the sector should be considered. The pineapple sector in Ghana is more established than other horticultural sectors in Kenya or Ethiopia for example. Ghana provides a suitable case for assessing the effects of Fairtrade certification as the sector has established in a way that allows for a balanced comparison between companies. In most countries only very few plantations take up Fairtrade certification and are therefore hardly representative for the developments in a sector. These findings may therefore be interesting to other horticultural sectors in other developing countries.

We conclude that Fairtrade is able to provide higher wages and comparably better working conditions for hired laborers on Ghanaian pineapple plantations beyond the GlobalGAP certification. While the latter also stipulates certain minimum requirements for employment and working conditions, the explicit labor requirements of Fairtrade certification lead to improved workplace provisions for workers. This shows that labor standards are crucial to generate qualitative employment in rural areas. While Fairtrade certification is unlikely to be a viable option for all export-oriented producers, we can hereby identify the positive effects of strict rules regarding worker welfare. Fairtrade certification may be one pathway of implementing better framework conditions for workers, but it is also the general attitude towards worker welfare that should be promoted. Fostering strategies in consideration of sufficient wages etc. could be a more long-term governmental strategy for quality employment generation that reduces the vulnerability of hired laborers. Particularly in rural areas, this enables a necessary development perspective where many people are drawn to cities to seek income generation opportunities.

Appendix

Table A.8 Overview of relevant Fairtrade regulations in the context of this study

The Fairtrade Standard for Hired Labor has two different types of requirements:

1) **Core requirements** which reflect Fairtrade principles and all of which must be complied with.
2) **Development requirements** which refer to the continuous improvements that you must make on average against a scoring system (also defining the minimum average thresholds) defined by the certification body.

Working hours	
Year 0 – core requirement	**3.5.9** Your company **must comply** with applicable national and local legislation and industry standards regarding working hours and overtime regulations. Your company **must not require** workers to work in excess of 48 hours per week on a regular basis.
Year 0 – core requirement	**3.5.10** Your company **must allow** workers at least one day of rest for every 6 consecutive days worked, unless exceptional circumstances apply. **…** An exception is valid for a maximum of 12 weeks per calendar year. It will not allow workers to work more than 14 hours per day or more than 72 hours per week or more than 18 continuous working days without rest.
Overtime	
Year 0 – core requirement	**3.5.11** Your company **must not require** its workers to work overtime. Overtime is allowable if it is voluntary and not used on a regular basis and does not extend over a period of more than 3 consecutive months. It **must not exceed** 12 hours per week, unless exceptional circumstances apply (see 3.5.10). In all cases overtime rates apply (see 3.5.12). National legislation **must be complied** with if it exceeds this requirement.
Year 0 –core requirement	**3.5.12** Your company **must compensate** overtime at a premium rate. The premium rate **must be paid** at a factor of 1.5 for work performed on regular workdays, and for work performed on the regional day of rest public holidays and night work a premium at a factor of 2 **must be paid**, unless otherwise defined by national legislation, by CBA or by agreements with unions.
Remuneration	
Year 0 – Core requirement	**3.5.1** Your company **must set** wages for workers and other conditions of employment according to legal or CBA regulations where they exist, or at regional average wages or at official minimum wages for similar occupations; whichever is the highest, with the intention of continually increasing salaries (see 3.5.4). Your company **must specify** wages for all employee functions and employment terms, such as piecework.
Year 0 – Core requirement	**3.5.3** For work based on production, quotas and piecework, during normal working hours, your company **must pay** the equivalent to average hourly waged work based on a

Year 1 – core requirement	**3.5.4** If remuneration (wages and benefits) is below living wage benchmarks as established by Fairtrade International, your company **must ensure** that real wages are increased annually to continuously close the gap with living wage. Wage increments **must be negotiated** with elected worker representatives considering the living wage.
Contract arrangements regarding employment status	
Year 0 –core requirement	**3.5.22** All regular work **must be undertaken** by permanent workers. Time-limited contracts and subcontracting are permitted during peak periods, in the case of special tasks and under special circumstances. Your company **must not use** production, quotas and piecework employment as a means to avoid time-bound contracts.
Paid leave	
Year 0 – core requirement	**3.5.13** Your company **must grant** workers at least 2 weeks of paid leave per year at minimum, not including sick and casual leave. Periods of annual leave **must be in line** with national legislation and/or with agreements detailed in a specific or sectorial CBA, if either of these exceeds 2 weeks.
Provisions of trainings	
Year 3 – Development requirement	**2.2.4**. Your company **must provide opportunities** to workers and staff to develop their skills and qualifications whenever feasible.
Year 0 –core requirement	**3.6.6** Your company **must** regularly **train** workers and their representatives in the basic requirements of occupational health and safety, relevant health protection and first aid, at least once per year. …
Labor unions/ collective bargaining	
Year 0 – Core requirement	**3.1.9.** All workers, regardless of nationality or residency status, including seasonal/temporary and migrant workers, **must have the right** to be elected as a worker representative and/or a member of the Fairtrade Premium Committee
(Core requirement: Your company **must not deny** these rights in practice, and your company **must not have opposed** any of these rights in the last 2 years prior to application for certification.)	**3.4.2** Your company **must**: • Respect the right of all workers to form or join trade unions; • Respect the right of workers to bargain collectively in practice; • **Not** engage in any acts of anti-union discrimination or in any acts of interference; • Not deny access rights for trade unions; • **Accept** that it has a duty to bargain in good faith with unions; • **Inform** the workforce about the local point of contact and posts relevant contact information in the workplace for workers to see and understand.
Year 0 – Core requirement	**3.4.5** In situations where workers are not represented by a trade union recognized for collective bargaining with the company, management **must allow** representatives of trade union organizations that represent workers in the sector or region to meet with workers on company premises at agreed times so that the trade union representatives can inform the workers about trade unions. Workers may also choose to meet with these trade union representatives at any other location. Times and locations

	of these agreed meetings **must be reasonable** and management **must not interfere** in any way with, nor conduct any surveillance of these meetings.
Year 0 – Core requirement	**3.4.6** There **must be** some form of democratically elected and independent workers' organization established to represent workers in the company and negotiate with management. Workers **must take** the initiative themselves and **must be allowed** to organize independently of management. Management is expected to provide the opportunity to workers to organize, but they **must not interfere** in the process nor directly or indirectly conduct elections related to the formation, recognition or governance of this organization. Your company **must respect** the self-organization of workers by engaging with representatives of these organizations through regular dialogue.
Year 0 – Core requirement	**3.4.7** Your company **must allow** access to trade union representatives in order to communicate about unionization and/or to carry out their representative functions at an agreed time and place. These meetings **must take place** without management interference or surveillance.
Year 0 – Core requirement	**3.4.8** Your company **must not** interfere in any way with the freedom of association by controlling or obstructing trade unions or elected worker representatives or supporting one workers' organization over another.
Year 0 – Core requirement	**3.4.9** Your company **must ensure** that elected worker representatives: • Have access to all workers in the workplace during working time without interference or the presence of management representatives and at agreed times, on average every three months; • Can meet among themselves during regular working hours, at least once a month for one hour; • Meet representatives of senior management during working hours at least once every 3 months. These meetings **must be scheduled** on a regular basis and **must be documented.**
Year 1 – Core requirement	**3.4.12** If there is no Collective Bargaining Agreements (CBA) in place, your company **must proactively engage** in a process to enter into a collective agreement with elected worker representatives. Your company should not refuse any genuine opportunity to bargain collectively with workers. Negotiations can take place with a recognized trade union or with elected worker representatives in the absence of a trade union, but only where such elected worker representatives are provided for by law and are legally authorized to bargain (see 3.4.6). In cases where workers have freely and specifically decided to not form or join a trade union and are not otherwise legally authorized to collectively bargain, then the collective bargaining requirement is waived. In these situations the certification body will determine whether there was any intimidation or coercion involved in this decision (see 3.4.4). The decision cannot be the result of any vote in which management was in any way involved.
Company service provisions	

Year 6 – Development requirement	2.2.9. Your company **must provide support** for crèche facilities for your workers' children either inside or outside your premises. (Development requirement from year 6 of certification onwards)
Year 0 – core requirement	**3.5.19** Your company **must provide** legal social security for all workers.
Year 3 – development requirement	**3.5.20** Your company **must work** towards all permanent workers having a provident fund or pension scheme.
Year 0 –core requirement	**3.6.18** Your company **must provide** access to appropriate healthcare in case of work-related illness or injury.
Year 1 –core requirement	**3.6.29** Your company **must offer** regular examinations and check-ups by a medical doctor to all workers on a voluntary basis at least every three years. Any findings **must be communicated** to the worker confidentially and in a readily understandable form. …

Table A.9 Overview of individual companies in the Ghanaian pineapple sector

	Selected Fairtrade certified companies (FT comp) for survey				Non-selected Fairtrade certified companies (FT comp) for survey		Selected Non-Fairtrade certified companies for survey				Non-selected Non-Fairtrade certified companies for survey				
	FT comp 1	FT comp 2	FT comp 3	FT comp 4	FT comp 5	FT comp 6	Non-FT comp 1	Non-FT comp 2	Non-FT comp 3	Non-FT comp 4	Non-FT comp 5	Non-FT comp 6	Non-FT comp 7	Non-FT comp 8	Non-FT comp 9
Size of the company in hectares	400	242	480	230	640	650	200	110	200	250	800	8	400	350	200
Size of the company in worker numbers	190	350	450	400	200	250	184	80	180	150	75	12	110	75	45
Productivity level in metric tons per week	60	100	200	300	150	60	150	40	96	30	60	4	30	30	20
Foreign involvement in company manage-ment	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No	No
Years of Fairtrade certification	7	14	6	2	10	17	-	-	-	-	-	-	-	-	-

Table A.10 Defining questions in overall job satisfaction score

	Statement
Job satisfaction	How do you feel about your job?
	How do you feel about the people you work with – your co-workers?
	How do you feel about the work you do in your job – the work itself?
	What is it like where you work – the physical surroundings, the hours, the amount of work you are asked to do?
	How do you feel about what you have available for doing your job – I mean equipment, information, good supervision, and so on?
Answers ranked via a 5-point Likert scale 1 = Very dissatisfied 2 = Dissatisfied 3 = Indifferent 4 = Satisfied 5 = Very satisfied	
Organizational Identification	I am proud to be an employee of this company.
	I am glad I chose to work for this company rather than another company.
Answers ranked via a 5-point Likert scale 1 = Strongly disagree 2 = Don't Agree 3 = Indifferent 4 = Agree 5 = Strongly agree	

Table A.11 First stage results for IV regressions

Variables	**First stage IV regression**	
	Coefficient	Standard error
Distance from village to Fairtrade company[8]	1.499***	(0.170)
Female worker	-0.216	(0.179)
Education	-0.0817	(0.174)
Age	0.0201**	(0.00823)
Job experience	0.366	(0.278)
Pineapple experience	0.485	(0.302)
Constant	-1.385***	(0.404)

[8] Dummy = 1 if the next Fairtrade company is located within a 5km radius of the village

Chapter IV. Fairtrade certification on plantations: Household wealth and welfare implications for hired labor

Abstract:

About 500 million workers are employed on agricultural plantations world-wide. They are considered to be one of the most vulnerable groups in the global trade system. Recent developments such as the vertical integration of agri-food chains and rising consumer awareness have led to the increased adoption of sustainability standards, such as Fairtrade. While Fairtrade aims to ensure adequate employment conditions, collective action and fair wages its ultimate objective is to improve the socioeconomic well-being of workers' households and their communities. The question remains whether Fairtrade certification of large-scale plantations can contribute to decreasing workers' monetary and non-monetary poverty. To address this question, we utilize original survey data from 325 plantation workers and apply regression analysis as well as matching approaches, controlling for company level scale of production and productivity levels. Our findings confirm that Fairtrade certification has a positive effect on household income through higher horticultural wage labor income. Further, households with workers employed on Fairtrade certified plantations are able to accumulate more assets. Our results further show that living standard indicators, in particular access to clean drinking water and electricity, are also positively correlated with Fairtrade certification. Social projects financed by the Fairtrade premium as well as the use of bargaining power could play a role in providing for these community-based services.

This chapter is co-authored by Meike Wollni. The author's contributions are as follows: KK and MW designed the research. KK collected, analyzed, and interpreted the data. MW assisted in the analysis and interpretation of the results. KK wrote the paper. MW commented the final manuscript. This chapter is has been accepted for publication as a book chapter as follows: Krumbiegel K.; Wollni, M. (2017) Fairtrade certification on plantations: Household wealth and welfare implications for hired labor. In Parvathi, P.; Grote, U.; Waibel, H. (Eds.) *Fair trade and Organic Agriculture: A Winning Combination?* Wallingford: CAB International.

1. Introduction

1.1. Fairtrade certified plantation agriculture

About 1.3 billion workers are employed in the agricultural sector worldwide, of which about 500 million work as casual, temporary or permanent workers on plantations. Hired labor on plantations or in factories are considered one of the most vulnerable groups in the global trade system. They are often exposed to discrimination, difficult working conditions, low wages and lack of bargaining opportunities. In recent years however, consumers have become increasingly aware of unfavorable employment conditions in the food producing industry. This awareness has been mirrored by the rise of private food and sustainability standards, such as Fairtrade. While the Fairtrade movement originally aimed to empower small-scale farmers to overcome global trade barriers of limited price information, organization and production in a free market, its support was further extended to plantation workers in the 1990s. Fairtrade's aim is "to empower workers and the sustainable social and economic development of workers and their communities" (Fairtrade International, 2014). In this context, the Fairtrade certification of large-scale agricultural companies not only aims to improve working conditions but also socioeconomic well-being of workers and their communities. While some studies have focused on the evaluation of general certification effects (particularly of GlobalGAP) in the employment context, very little is still known about the specific role of Fairtrade for worker's household wealth accumulation and welfare benefits.

Numerous studies and evaluations assess Fairtrade's impact on small-scale farmers regarding income, farm productivity and poverty reduction. But only a few studies look at the implications of Fairtrade certification on plantations for workers and their households. Granville and Telford (2013) find via descriptive comparison that Fairtrade workers earn salaries above the minimum wage in the wine industry in South Africa. Ruben and van Schendel (2009) compare 50 workers on one Fairtrade certified banana plantation to a non-certified one. They find that workers on the non-certified plantation receive a higher salary, but also work longer hours and receive smaller benefits (Dragusanu et al., 2014). A study by the "Fairtrade, Employment and Poverty Reduction" project from the University of London does not find evidence for higher wages through Fairtrade certification on small farms and large estate units in the tea, coffee and flower sectors in Uganda and Ethiopia (Cramer et al., 2014). Raynolds (2012) finds that Fairtrade's benefits for workers particularly lie in its ability to empower them and secure their well-being at work. The empowerment pathway is mainly driven by Fairtrade-mandated worker committees in the Ecuadorian flower sector, where labor unions are largely absent.

While Fairtrade certification of large-scale plantations is predominantly concerned with working conditions, wages and worker empowerment, ultimately Fairtrade aims to create a framework that allows workers to provide education for their children, ensure household food security and reduce poverty. There are potential channels through which wealth and living standards may be enhanced for workers on Fairtrade certified plantations. First, Fairtrade products receive a guaranteed minimum price in the Fairtrade market, which is not only to cover the costs of sustainable production but also to meet a so-called living wage within the particular sector. This guaranteed price could contribute to potentially higher income levels going beyond the minimum wage, and thus may provide consistent income for the worker household. Second, consistency could further be supported by stable work arrangements. Work contracts provided on Fairtrade plantations may be more permanent, contributing to a household's ability to buffer shocks and increase its resilience. Third, certain working conditions such as payment of social security, loan availability and health care provisions may ease household costs and provide extra funds for investments in education, asset accumulation or agricultural inputs. Fourth, a Fairtrade premium that is paid on top of the guaranteed market floor price is invested in community infrastructure, vocational trainings or educational projects. This may raise overall community welfare and therefore also indirectly affect workers' household welfare levels. Against this background, this study aims to address the following research questions:

1) Does Fairtrade positively affect the income level of workers' households and
2) Does Fairtrade contribute to wealth accumulation and higher living standards?

1.2. The export pineapple sector in Ghana

The case study presented in this book chapter is based on cross-sectional data from hired labor in the Ghanaian pineapple sector. Pineapple is one of Ghana's most important horticultural export crops. Its production was introduced in the 1980s to Ghana by smallholder farmers. With a raising demand particularly from Europe, large-scale farmers began acquiring land for export production close to the shipping port and airport Europe (Fold and Gough, 2008). The dominant pineapple type exported was "Smooth Cayenne", a pineapple variety that is adapted to local growing conditions. In the 1990ies, Ghana was the 3rd most important pineapple supplier to the European Union after Cote d'Ivoire and Costa Rica. In the late 1990ies, Fresh Del Monte developed a new variety called MD2 pineapple, the so-called "shipping pineapple" with a high level of sweetness, low acidity and longer shelf-life than previous varieties. MD2 is considered an industrial crop that has been developed for large-scale and more mechanized production. Its expansion in Costa Rica coupled with vast marketing campaigns in the United States and Europe ultimately changed consumer taste in favor of the new variety. At the same time, production levels increased in multiple countries and eventually led to falling export

prices. Because MD2 requires fertilizer, pesticides, plastic mulching and cooling facilities, it demands high initial and continuous capital investments. Ghanaian producers were unable to adapt to the quick change due to information and capital constraints, leading to a decline in the EU market share from 10.5% in 2003 to 4.3% in 2007 (Fold and Gough, 2008; Harou et al., 2017; Kleemann et al., 2014). This has forced the majority of small-scale farmers to drop out of export-oriented production and today they predominantly sell to the local market or to processors. Large-scale farms were better able to adjust to the changes taking place in the industry. Today, about 15 large-scale plantations produce pineapples for the export market, eight of which make up for 93% of Ghana's pineapple export volume (Gatune et al., 2013). In 2011, Ghana's export value of fresh and processed pineapple was worth 51 Million USD, representing the 6th most important export crop in terms of value (Gatune et al., 2013). All of the exporting plantations are GlobalGAP-certified, which constitutes a minimum requirement to export to the European Union, the main market for Ghanaian pineapple. Additionally, about half of the plantations are Fairtrade certified. Fierce competition in international pineapple markets has motivated many Ghanaian plantations to target this particular niche market. Overall, increasing demand for quality assurance, consistent supply and certification remain challenging for Ghanaian producers.

2. Data and variables

2.1. Survey and sample

Our dataset consists of original survey data from 361 hired plantation workers and their households living in rural areas in the Ghanaian pineapple belt. This central area for pineapple production stretches across four different regions: Central Region, Eastern Region, Greater Accra Region and Volta. For the purpose of our study, we restrict our sample to manual or low-skilled laborers and therefore exclude the management, administrative and technical levels, resulting in a sample of 325 observations for the analysis. The data collection process incorporated two stages. In November 2014 we held semi-structured interviews with main stakeholders in the pineapple export sector, including representatives from agricultural ministerial divisions at the central and district level, the association of sea-freight pineapple exporters of Ghana, foreign aid agencies, and management boards from pineapple producing and processing companies. In the second stage, we collected original survey data from workers between April and July 2015. We purposefully selected four Fairtrade and four Non-Fairtrade certified companies that are comparable to each other. We compare our companies based on information regarding (1) terms of size in area, (2) size in workers, (3) production capacity levels in metric tons per week and (4) involvement of foreign management. Table 13 shows that Fairtrade companies work on a larger scale than Non-Fairtrade companies, particularly in terms of the area of production and the workers employed. On average the Fairtrade

companies have been Fairtrade certified for 3.63 years, individually however ranging from 2 to 14 years. On the average, Fairtrade companies sell approximately 38% of their production into the Fairtrade market.

Table 13 Overview of the companies

Variable	Fairtrade certified company		Non-Fairtrade certified company		Difference and Test statistics
N (8)	Mean value	Std. deviation	Mean value	Std. deviation	
Size of the company in hectares	338	122.32	190	58.31	148*
Size of the company in worker numbers	347.50	112.66	148.50	48.12	199**
Productivity level in metric tons per week	165	107.55	79	55.53	86
Foreign involvement in company management	0.75	0.5	0.75	0.5	0

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

From each company, we obtained lists of workers in the villages, from which the companies source their laborers. Based on these lists, we drew a stratified random sample of workers by company for the interviews. The structured questionnaire incorporated questions on household characteristics, family health and dietary diversity, land ownership and agricultural production as well as employment conditions, provision of services, labor union involvement and social projects implemented by the companies. Interviews were conducted face-to-face by local field assistants with an agricultural economics background and who participated in in-depth questionnaire training and pre-testing. Most of the households in our sample comprise a household head (usually the husband) and a spouse. When there is no husband, we consider the female to be the household head. In our scenario of plantation employment, either the household head or the spouse was interviewed as a worker of a pineapple plantation. In some cases the husband/wife also worked for the same company. In our analysis, we differentiate between Fairtrade workers on Fairtrade certified plantation (and their households) and workers on Non-Fairtrade certified plantation (and their households). For simplicity, we refer to them as Fairtrade workers (FT workers) and Non-Fairtrade workers (Non-FT workers).

2.2. Measuring welfare indicators

In the context of this study, we are interested in evaluating the impact of wage labor on Fairtrade certified plantations on several welfare indicators. Firstly, we consider the contribution of wage labor income to overall household income. Household income is aggregated for the past 12 months and includes: income from selling agricultural produce, income from own business, income from off-farm

employment as well as income from other sources, such as pensions, gifts and remittances. Secondly, we are interested in asset accumulation as an indicator for more long-term wealth accumulation. In this assessment we closely follow Filmer and Pritchett (2001) and construct a standardized asset index via principal component analysis. Principal components enable us to capture the most common information from linear combinations of the asset variables (Filmer and Pritchett, 2001). In the composition of the index we include thirteen variables[9] that reflect the possession of the following assets: motor vehicle, motorbike, bicycle, fan, freezer, sewing machine, water tank, gas stove, jewelry, kente cloth, TV set, radio and bank account. For easier interpretation we transform the values into a standardized asset index that is calibrated on a 0 to 100 scale by the formula used in Sekhar et al. (1991).

Thirdly, we are interested in looking into different proxy indicators for standard of living. In particular, we consider (1) access to clean drinking water and (2) electricity. By including provisions predominantly made at the village level into our analysis, we address more overarching development indicators. Apart from Fairtrade's potential impact on household income, Fairtrade certification of companies may positively affect infrastructure provision at the village level. The Fairtrade premium is spent on social and infrastructural projects with both workers and villages as beneficiaries, such as building groundwater pumps or toilet facilities. Furthermore, the presence of export-oriented companies overall may improve village settings due to their demand for water, electricity, a sewage system etc. In particular, Fairtrade companies may also use their bargaining power towards local governments to have these services provided as they might be more interested in ensuring village services surrounding their company grounds. In the analysis we also control for village characteristics and infrastructure in addition to household level characteristics (income, education, etc.). Drinking water is defined as clean when derived from improved sources: household connection, public standpipe, borehole or pump, protected dug well, protected spring, rainwater collection (UNICEF/WHO, 2015). Rivers, lakes, and streams as well unprotected wells and springs are considered unimproved sources of drinking water (UNICEF/WHO, 2015). Access to electricity is measured as the main source of lighting.

2.3. Descriptive statistics

We present household demographics in table 14. Fairtrade workers are on average 2.4 years older and have more dependents (children below the age of 18 and/ or adults above the age of 65) living in the household than Non-Fairtrade workers. The distribution of female-headed households and

[9] Defined as dummy variables that take the value one, if the household owns at least one unit of the respective asset.

religious affiliation are similar between the two comparison groups. Non-Fairtrade workers seem to have slightly better education levels with a higher number of workers being at least secondary school graduates and a lower share with no formal education at all. Literacy rates are nonetheless comparable across all workers. When looking at the living conditions indicators, we see that households of FT workers are more likely to have electricity as well as clean access to drinking water. In addition, the composite asset index shows that FT workers have a higher number of assets in comparison to Non-FT workers.

Table 14 Summary statistics of worker and household demographics including indicators of wealth and standards of living

Variable	Household with at least 1 Fairtrade worker		Household with at least 1 Non-Fairtrade worker		Difference and Test statistics
	Mean value	Std. dev.	Mean value	Std. dev.	
Household Demographics					
Number of workers in Household	1.49	0.61	1.36	0.49	0.14**
Number of workers on pineapple plantations in Household	1.23	0.47	1.10	0.30	0.13***
Number of dependents	2.52	1.54	1.97	1.43	0.55***
Female Household Head	0.23		0.28		0.04
Protestant	0.85		0.86		0.01
Catholic	0.03		0.06		0.03
Muslim	0.04		0.02		0.02
Worker Demographics					
Female worker	0.62		0.61		0.01
Worker is married	0.81		0.67		0.13***
Worker is literate	0.46		0.50		0.04
Worker did not go to school	0.33		0.15		0.17***
Worker finished primary school only	0.23		0.23		0.01
Worker finished secondary school or higher	0.44		0.62		0.18***
Age of Worker (years)	38.51	9.10	36.07	10.46	2.44**
Living conditions					
Electricity	0.86		0.78		0.08*
Earthen floor	0.17		0.11		0.06
Access to improved sanitation	0.24		0.19		0.06
Clean drinking water	0.88		0.69		0.19***
Total agricultural land	1.02	1.35	0.98	1.22	0. 04
Standardized Asset Index	22.47	17.45	15.77	16.95	6.70***

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

In table 15 we take a closer look into income generating activities and company provisions contributing to total household income and welfare. Concerning households' income levels we differentiate between (1) income from horticultural wage employment, (2) income generated on own agricultural land, (3) income from self-employment (such as tailoring, shop keeping or hair dressing etc.), (4) income from off-farm wage employment as well as (5) additional income from

pensions, gifts and others. While most income sources are equally distributed across the two different groups, the income from horticultural wage labor for Fairtrade worker households is significantly higher than for Non-Fairtrade worker households. This may in part be explained by higher hourly wages paid to FT workers. The vast majority of FT workers are also hired under a permanent work contract. A permanent employment status provides worker households with more security for long-term planning and combined with access to credit potentially enables them to make long-term investments. FT workers also participate in more training and are more likely to be engaged in a labor union.

Table 15 Summary statistics of worker incomes and company provisions

Variable	Household with at least 1 Fairtrade worker		Household with at least 1 Non-Fairtrade worker		Difference and Test statistics
	Mean	Std. dev.	Mean	Std. dev.	
Household Incomes (in GHS)					
Total income	5720.05	5951.88	4068.02	3272.86	1652.03***
(1) Horticultural wage labor income	3116.36	1339.32	2602.60	1101.19	513.76***
(2) Agricultural income	960.99	3734.57	559.20	2808.91	401.79
(3) Self-employment income	720.98	1580.82	584.78	1449.81	136.20
(4) Other wage labor income	573.25	2441.30	264.60	1306.67	308.65
(5) Other income	75.12	287.77	56.82	155.66	18.30
Workplace conditions					
Hourly salary (in GHS)	1.54	1.39	1.17	0.61	0.38***
Daily salary (in GHS)	10.10	6.02	9.22	4.18	1.73***
Permanent employment	0.87		0.53		0.34***
Labor union membership (if there is a labor union present at the company)	0.73		0.45		0.27***
Number of trainings received in the last 12 months	1.70	2.86	0.40	1.44	1.30***

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

3. Methodology

3.1. Regression analysis

To analyze the impact of wage labor on Fairtrade certified plantations on household wage labor income, we estimate the following linear regression model:

(1) $$wage\ labor\ income_i = \alpha_0 + \alpha_1 \mathrm{FT}_i + \alpha_2 \mathrm{x}_i + \varepsilon_i,$$

where wage labor income is measured as the total income earned from horticultural wage labor during the past 12 months by household *i*; *FT* indicates whether the workers are employed on a Fairtrade certified plantation; *x* is a vector of household, worker and company specific characteristics; and ε is a random error term. The treatment dummy *FT* takes a value of one if the pineapple plantation is Fairtrade certified and zero otherwise. Regarding company-specific variables, we take productivity levels, company size (in hectares) and employment conditions into account. Furthermore, we include worker demographics and worker ability (whether the worker him/herself grows pineapple on own farm and whether he/she has worked for a fruit company before taking up the current job). Additionally, we control for the different types of manual labor jobs. Finally, given that there might be more than one worker working on a pineapple plantation in the household, we control for the number of workers in the household.

Secondly, we estimate a linear regression model to investigate the effect of Fairtrade certification on asset accumulation:

(2) $$standardized\ asset\ index_i = \beta_0 + \beta_1 \mathrm{FT}_i + \beta_2 \mathrm{x}_i + \varepsilon_i \ ,$$

where the standardized asset index for household *i* is derived from principal component analysis and ranges between zero (low asset accumulation) and 100 (high asset accumulation). Vector x includes household demographics expected to influence the purchase and accumulation of assets at the household level.

Thirdly, we estimate a probit model to evaluate the impact of Fairtrade certification on two selected standard of living indicators (access to clean drinking water and electricity):

(3) $$standard\ of\ living_i = \gamma_0 + \gamma_1 \mathrm{FT}_i + \gamma_2 \mathrm{x}_i + \varepsilon_i \ ,$$

where the standard of living for household *i* is specified as one of two dummy variables taking the value one if the household has access to clean drinking water or to electricity, respectively. The vector x incorporates household as well as village-specific characteristics, such as infrastructure and service availability. To account for the fact that households are more comparable on the village-level, we cluster the standard errors at village level for all regressions.

3.2. Sample restriction and propensity score matching

As individuals can choose to some extent whether they work for a Fairtrade certified or a Non-Fairtrade certified company, there may be unobserved characteristics, such as motivation or dedication, that influence the choice of work place as well as the outcome variables. This could potentially lead to selection bias in the estimation of the linear regression and probit models introduced in the previous section. Effectively, the freedom to choose a work place in rural Ghana is often restricted due to long distances and limited access to transport. Therefore, in practice, workers select their work place mainly based on proximity to their village to reduce daily commute, and vice versa, companies source the majority of their workers from villages surrounding their estate units. This is also reflected in our data. Our workers come from 56 villages. In 29 villages there are only FT workers and in 25 villages there are only Non-FT workers. In only 2 of these villages there are both FT and Non-FT workers located. This shows that indeed workers do not necessarily work for the company they consider "best" (which may be correlated with Fairtrade) but base their decision to take up work on the proximity and access to the closest company. Further, medium-term migration for paid labor seems to also be relatively limited in comparison to other export-oriented production sites. From our sample, only 16% of all workers state to have resettled to the pineapple growing area for work reasons. Still, to reduce potential selection bias, we apply a sample restriction based on the propensity score as well as a matching approach (Rosenbaum and Rubin, 1983). This enables us to compare and match FT and Non-FT workers based on certain observable characteristics, which are assumed to be correlated with the unobservable characteristics[10].

We define treatment FT as a binary variable that equals one if the worker in the household is employed by a Fairtrade company. Using a vector of observed variables (x), we then predict the probability of working on a Fairtrade plantation (the propensity score) to create a comparable counterfactual group:

$$p(x) = \Pr\{T = 1|x\} = E\{T|x\}$$

We select covariates that satisfy the Conditional Independence Assumption (CIA) by considering those that affect participation. A probit model is used to regress the binary treatment variable on worker characteristics and derive the propensity score. Appendix table A.12 shows the overview of covariates included in the probit model. The region of common support is between 0.10 and 0.98 and the balancing property is satisfied. Based on the estimated propensity scores, we trim the

[10] Propensity score matching is based on observable characteristics that influence participation and outcome and thus does not control for bias resulting from unobservable characteristics.

observations outside of the area of common support and estimate the regression specifications introduced above using only those observations that fall within the area of common support.

As robustness check to our regression analyses, we apply propensity score matching techniques. Based on the matched households, we calculate the average treatment effect on the treated (ATT) by comparing the outcomes between the treated and the control group.

$$ATT = E(\Delta|p(x), T = 1) = E(y_1|p(x), T = 1) - E(y_0|p(x), T = 1)$$

We apply three different matching techniques with bootstrapped standard errors (Caliendo and Kopeinig, 2005): (1) kernel matching (using weighted averages of all individuals in the control group to construct a counterfactual outcome), (2) radius matching (imposing a tolerance level on the maximum propensity score distance (caliper, here=0.1) and (3) stratification matching (partitioning the common support of the propensity score into a set of intervals and calculating the impact within each interval by taking the mean difference in outcomes between treated and control observations). Results are presented in appendix table A.13. The propensity score matching results confirm our regression findings.

4. Findings

4.1. Fairtrade certification and horticultural wage labor income

Results on the determinants of horticultural wage labor income are presented in table 16. We find that Fairtrade certification contributes significantly to higher horticultural wage labor income, increasing average yearly incomes by approximately 560-580 Ghana Cedi[11]. This can be attributed to higher wages on Fairtrade certified pineapple plantations (see descriptive statistics). With respect to the company-specific variables, we find that company size has a significantly negative effect on wage labor income, indicating that smaller plantations may provide better wage conditions. The size of the effect, however, is very small. Furthermore, company productivity also matters. Higher output positively influences horticultural wage labor income, albeit the magnitude of the effect is very small as well. Regarding household-specific characteristics, as expected the number of persons employed on horticultural plantations increases horticultural wage income at the household level. Female workers earn almost 200 Ghana Cedi less than their male co-workers per year. This may be due to the different kind of jobs men and women do, the former potentially engaged in more qualified tasks or in more supervisory roles within the sectors we control for. Indicators of experience in pineapple

[11] 570 GHS = approx. 140 USD (June 2015)

production do not determine wage labor income: neither having previously worked for a fruit company nor growing pineapple on the own farm influences horticultural wage income.

Table 16 Regression results for horticultural wage labor income of hired labor

Variable	OLS	OLS with restricted sample
Fairtrade certification	589.2**	567.5**
	(256.5)	(261.4)
Size of company (in used ha)	-3.167***	-3.188***
	(1.097)	(1.104)
Productivity of company (metric tons per week)	1.207	1.397
	(1.226)	(1.221)
Worker is female	-197.6*	-193.9*
	(103.7)	(105.5)
Worker finished secondary school	173.7	161.8
	(138.9)	(138.0)
Age of worker	-9.160	-9.492
	(6.470)	(6.862)
Number of workers in household	2,055***	2,057***
	(156.1)	(154.3)
Previously worked for a fruit company	174.1	182.7
	(178.9)	(190.3)
Grows pineapple on own farm	133.5	160.1
	(176.4)	(171.5)
Works in planting-related activities	-35.98	-31.60
	(140.3)	(147.2)
Works in export-related activities	131.9	104.3
	(148.3)	(153.1)
Works with chemical application	83.17	85.26
	(163.0)	(168.5)
Works in sucker management	92.94	87.05
	(181.7)	(183.9)
Works in other menial tasks	425.1**	489.0**
	(210.8)	(211.3)
Constant	1,122**	1,128**
	(488.0)	(509.0)
N	325	315
R-squared	0.551	0.562

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

4.2. Fairtrade certification and asset accumulation

We are now interested in the role of Fairtrade certification on asset accumulation, which is commonly regarded as a more durable indicator than income. In table 17 we see that households with FT worker(s) have a significantly higher asset index than households with Non-FT workers. Interestingly, we further see that particularly female-headed households have much higher asset accumulation ratios than male-headed households. A reason for this could potentially be that women are restricted in other wealth accumulation strategies, such as buying land, and therefore

have to resort to asset accumulation in particular. Marriage, higher education levels and more agricultural land all highly correlate with increased accumulation of assets as is expected.

Table 17 Regression results for asset index of workers' households

Variable	OLS	OLS with restricted sample
Worker(s) in HH works for a Fairtrade certified pineapple company	7.793***	7.263***
	(2.750)	(2.016)
Household Head is female	9.207*	9.898***
	(4.634)	(3.700)
Age of Household Head	0.041	0.002
	(0.069)	(0.10)
Household Head is married	10.58**	10.79***
	(4.466)	(3.838)
Household Head finished primary school only	5.198**	4.950*
	(2.053)	(2.995)
Household Head finished secondary school or higher	12.79***	12.59***
	(2.181)	(2.566)
Number of dependents	-0.191	-0.209
	(0.602)	(0.641)
Agricultural land used for production	1.870*	1.972**
	(1.090)	(0.763)
Distance to market	-0.301**	-0.311**
	(0.126)	(0.158)
Constant	-3.255	-1.552
	(5.741)	(5.929)
N	325	315
R-squared	0.192	0.187

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

One potential impact channel through which Fairtrade leads to higher asset accumulation may be through the income pathway. Increases in horticultural wage labor income may be of particular importance, given that it represents the major source of income for the households in our sample, contributing approx. 60% to total household income. However, Fairtrade certification may affect asset accumulation not only through the income pathway, but through other channels as well. Work arrangements are more stable and permanent on Fairtrade certified plantations and can therefore contribute to more long-term decision making when it comes to investments. Fairtrade may also ease expenditure constraints through payments of health care needs, social security contributions (see table 18) as well as social and economic projects that are funded by the Fairtrade premium. Fairtrade premium-funded social and economic projects targeting the individual level can range from payment of school fees for secondary school children of workers, provision of uniforms and/or books to school-aged children of workers to micro-finance loans with lower interest rates than official banks and lenders. We can see in table 18 that 24% of the Fairtrade workers have used a loan that was facilitated by their company. Access to loans enables investments in assets. In contrast, only 5%

of Non-Fairtrade workers were able to do the same. These may be additional pathways of being able to accumulate assets for workers' households.

Table 18 Provision of services within companies

Variable	Household with at least 1 Fairtrade worker		Household with at least 1 Non-Fairtrade worker		Difference and Test statistics
	Mean value	Std. dev.	Mean value	Std. dev.	
Company services used					
Lunch	0.21	0.41	0.28	0.45	0.07
Transport	0.49	0.50	0.70	0.46	0.21***
Medical care for worker on site	0.64	0.48	0.35	0.48	0.29***
Medical care for worker off site	0.59	0.49	0.30	0.49	0.19***
Medical care for family off site	0.06	0.24	0.01	0.08	0.05***
Social allowances (for funerals etc.)	0.07	0.25	0.01	0.11	0.05*
Loan	0.24	0.43	0.05	0.22	0.19***

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

4.3. Fairtrade certification and standard of living indicators

Finally, tables 19 and 20 present the results on two proxy indicators for standard of living: access to clean drinking water and to electricity. We find Fairtrade certification to positively correlate with both indicators. This could be due to direct effects from higher horticultural wage labor income at the household level but also to more indirect effects, such as company presence or their social projects at the village level. Given that both drinking water and electricity are provided on the village level, village specific indicators play an important explanatory role in comparison to household characteristics. The level of development, location and access to community services all correlate strongly with the two standards of living indicators. The more development projects[12] there are in a village, the more likely it is that villagers have access to clean drinking water and electricity. The farther the village is situated from a tarred road; this access becomes more difficult, particularly for electricity provision. Interestingly the distance from a horticultural company is positively correlated with access to clean drinking water. The reason for households in proximity to companies to have reduced access to clean drinking water may derive from the definition of clean drinking water. Pineapple companies usually set up production facilities close to surface water bodies such as rivers and lakes for the irrigation of their crops. Sometimes they also build water reservoirs to cater to their needs. Villages located close to the companies may indeed use the same water sources. By definition, these surface water sources are unimproved.

[12] Here we asked the villages about all development projects and donors present in the village. In this case development project do not only refer to those funded by the Fairtrade Premium.

Table 19 Probit results for standard of living indicator 1: access to clean drinking water

Variable	Probit	Probit with restricted sample
Worker(s) in HH works for a Fairtrade certified pineapple company	0.788***	0.885***
	(0.244)	(0.280)
Income (in 1000 GHS)	0.009	0.008
	(0.020)	(0.020)
Household Head is female	-0.012	-0.166
	(0.282)	(0.301)
Age of Household Head	0.027***	0.032***
	(0.010)	(0.009)
Household Head is married	-0.324	-0.619*
	(0.295)	(0.321)
Household Head finished primary school only	-0.014	-0.036
	(0.262)	(0.264)
Household Head finished secondary school or higher	0.346	0.350
	(0.248)	(0.261)
Number of dependents	0.091*	0.044
	(0.052)	(0.051)
Agricultural land used for production	-0.128*	-0.124*
	(0.074)	(0.075)
Number of development projects in village	0.322***	0.301***
	(0.090)	(0.088)
Number of newly built houses in village	-0.003***	-0.003***
	(0.000)	(0.001)
Distance to health center	-0.027	-0.028
	(0.020)	(0.023)
Distance to a tar road	-0.009	-0.012
	(0.021)	(0.023)
Distance to closest fruit company	0.114***	0.123***
	(0.040)	(0.042)
Constant	-1.268***	-1.039**
	(0.389)	(0.429)
N	323	313
Pseudo R-squared	0.216	0.229

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

Table 20 Probit results for standard of living indicator 2: access to electricity

Variable	Probit	Probit with restricted sample
Worker(s) in HH works for a Fairtrade certified pineapple company	0.728**	0.739**
	(0.306)	(0.300)
Income (in 1000 G.C.)	-0.014	-0.015
	(0.015)	(0.015)
Household Head is female	-0.222	-0.347
	(0.344)	(0.358)
Age of Household Head	-0.019**	-0.018**
	(0.009)	(0.009)
Household Head is married	0.261	0.139
	(0.318)	(0.366)
Household Head finished primary school only	-0.503*	-0.544*
	(0.304)	(0.320)
Household Head finished secondary school or higher	-0.297	-0.335
	(0.255)	(0.270)
Number of dependents	0.028	0.020
	(0.074)	(0.073)
Agricultural land used for production	-0.080	-0.085
	(0.071)	(0.074)
Number of development projects in village	0.158	0.166
	(0.111)	(0.108)
Number of newly built houses in village	0.002	0.002
	(0.002)	(0.002)
Distance to health center	-0.019	-0.024
	(0.023)	(0.023)
Distance to a tar road	-0.065***	-0.063***
	(0.025)	(0.025)
Distance to closest fruit company	-0.059	-0.050
	(0.038)	(0.036)
Constant	1.764**	1.894***
	(0.705)	(0.701)
N	321	312
Pseudo R-squared	0.130	0.128

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

As mentioned before, standard of living indicators, such as access to clean water and electricity, are predominantly provided on the village level and can be a direct result of projects financed by the Fairtrade premium. Table 21 shows exemplary village-based projects and beneficiaries. While this list is by no means complete, it gives an indication of potential channels of Fairtrade contributing to village-level welfare outcomes.

Table 21 Selected exemplary projects financed by Fairtrade premium

Village	Type of project	Workers in the village (from sample)	Village population
Obom	Renovation of health post and maternity ward	14	2000
Maampehia	Classroom construction for kindergarten	15	380
Otaten	Borehole renovation	10	250
Akutiaku	Borehole renovation	17	1200
Papaase No. 1 & No.2	Construction of toilet facilities	14	2500 & 3000
Nsuobri	Construction of IT center	2	1200

In general, such projects may certainly also be implemented by Non-Fairtrade certified companies, but this is not the case in our study area. In general these projects are appreciated by worker's households. More than half of the projects mentioned are stated to benefit the households of the workers interviewed. But even though some projects cater to fewer beneficiaries (e.g. families with children or young mothers), the vast majority of workers (almost 70%) prefer the implementation of the projects instead of just an equal distribution of money. This is contrary to what is suggested during interviews with company managements, who feel that projects are very often not appreciated by the workers if they did not directly benefit from them. Combining the more quantitative findings of the tables 19 and 20, which show a positive correlation between Fairtrade certification and higher living standards, with the subjective statements of the workers' appreciation for these projects; we can conclude the Fairtrade premium has the potential to contribute to community welfare.

Additionally, export-oriented companies overall may have an impact on standard of living indicators through more indirect channels. Their set-up and establishment in the area may lead to infrastructure development and service provisions on the local level as a spillover effect of government investment promotion. It may even be the case that particularly Fairtrade certified companies indeed use their bargaining power to foster these kinds of provisions for the villages surrounding their company grounds where they source the majority of their workforce from. Overall, we conclude that particularly Fairtrade-certified companies have the potential to improve local community welfare. These potentials could further be used to contribute to other standard of living indicators. On average, only 22% of the households in our sample have access to improved sanitation. This could certainly be an area for further improvements.

5. Conclusion

Large-scale horticultural and floricultural estates catering to the export market are expanding in developing countries. Such plantations are often associated with the exploitation of workers and

appalling working conditions. Increased consumer awareness has led to a rise for sustainability standards, such as Fairtrade, Organic or Rainforest Alliance. With a considerable market to provide their produce to, a number of pineapple companies in Ghana have adopted the Fairtrade label. In the context of this chapter, we evaluate the implications of Fairtrade certification for worker's household welfare and standards of living in the broader context of rural development.

Our findings confirm that Fairtrade certification has a positive effect on household income through higher horticultural wage labor income. Further, households with worker(s) employed on Fairtrade certified plantations are able to accumulate more assets. This may partly be a result of higher horticultural wage labor income, but Fairtrade certified companies also facilitate asset accumulation via different pathways, such as reduction of expenditure constraints for workers or loan provisions. Our results further show that other living standard indicators are also positively correlated with Fairtrade certification. Living standard indicators in rural Ghana do not only depend on household income, but also on infrastructure provision at the village level. Access to clean drinking water and electricity, but also to improved sanitation, health and educational services is often determined by investments either by the local government, local companies or aid agencies. Here, Fairtrade projects can certainly play an important role in catering to community-based needs. But projects are voted upon by all workers which in our study area are spread over a large number of villages. Often, larger villages where more workers live have a better chance of being allocated projects due to their inhabitants' votes. Smaller (and often also poorer) villages usually accommodate fewer workers and therefore potentially have less of a chance in receiving a project. Such implications for Fairtrade's project allocation may have to be considered in more detail by the certification body. Based on our findings, also Non-Fairtrade certified companies may consider fostering community welfare through local projects. Direct investments at the village level through social projects can potentially contribute to the development of areas affected by the setup of large-scale agricultural production sites and therefore also to overarching development goals.

Our data set is not free of limitations. Relying on a cross-sectional dataset for our analysis, we cannot fully correct for unobservable characteristics possibly leading to selection bias. Future research should validate our findings using time-series or panel data. Furthermore, we realize that a company individually decides to become Fairtrade certified or not, whether the reason for this decision is altruistic or based on market demand. While we account for company level characteristics in our analysis, in our descriptive statistics we see, that it is mostly larger and potentially already more successful companies that become Fairtrade certified.

Based on our findings, the perception that large-scale plantation agriculture yields only minimal social benefits may need to be revised. In fact, considering differences between companies, production practices and worker treatment is crucial to drawing viable conclusions regarding the implications of changing agricultural patterns for rural development. Certification and standards have gained prominence over the past years. In the 1990s it was highly contested within the Fairtrade movement that plantations should be able to receive Fairtrade certification. Yet, this step has allowed Fairtrade to adapt to a land tenure and production system that is increasingly important particularly for developing countries, where governments are supporting land consolidation to increase productivity. In this context, the growing demand for stricter labor regulations and standards can support the generation of benefits for households and communities involved in plantation agriculture. Further, increasing market demand for sustainably certified products and sustaining consumer responsibility is crucial in enabling these positive developments.

Appendix

Table A.12 Determining propensity scores – Probit model of Fairtrade workers

Variable	Marginal effects	Standard error
Age of worker	0.136**	0.06
Age of worker^2	-0.002**	0.001
Female Household Head	0.525*	0.298
Worker is married	0.892***	0.320
Worker has no school education	0.754***	0.197
Worker has primary school education	0.210	0.186
Household size	0.178**	0.91
Number of dependents	-0.064	0.107
Household Head was born in the village he/she lives in today	-0.264*	0.155
Protestant	-0.149	0.263
Catholic	-0.409	0.456
Agricultural land size under production	-0.353**	0.156
Agricultural land size under production^2	0.063*	0.035
Observations	*322*	
Pseudo R2	*0.13*	

* Result is significant at a 10% significance level
** Result is significant at a 5% significance level
*** Result is significant at a 1% significance level

Table A.13 Matching results for Fairtrade workers for horticultural wage labor income, asset index, access to clean drinking water and electricity

	Average treatment effect on the treated	Standard error	t-value	No. Of the treated	No. Of the controlled
Horticultural wage labor income					
Kernel matching	670.67	144.45	4.64	164	152
Radius matching (with 0.1 caliper)	542.04	149.03	3.64	164	152
Stratification matching	680.62	159.78	4.26	164	152
Asset Index					
Kernel matching	6.46	1.68	3.86	164	152
Radius matching (with 0.1 caliper)	5.29	2.21	2.40	164	152
Stratification matching	6.93	2.10	3.31	164	152
Access to clean drinking water					
Kernel matching	0.16	0.04	3.70	164	152
Radius matching (with 0.1 caliper)	0.19	0.05	3.82	164	152
Stratification matching	0.18	0.05	3.34	164	152
Access to electricity					
Kernel matching	0.10	0.05	1.81	164	152
Radius matching (with 0.1 caliper)	0.11	0.05	2.37	164	152
Stratification matching	0.10	0.05	1.90	164	152

Chapter V. General conclusion

1. Findings

In this dissertation, the aim is to evaluate the role of employment to contribute to workers' capabilities. By utilizing an original household survey data set from the Ghanaian pineapple sector, we address the ability of employment as such to foster capabilities and expand this to the quality of employment as a catalyst for enhancing workers choices. For a more comprehensive understanding, we evaluate both the individual and household effects of employment. Sen's capability approach provides us with a suitable conceptual framework to do so.

To address the first research objective, we evaluate how women may be empowered through horticultural employment. The increased emergence of large-scale plantations catering to the export market in rural areas may foster income generating opportunities for women, but little is still known about their empowerment pathways. We contribute to the existing research gap by utilizing quantitative methodologies that capture the multidimensionality of the empowerment concept. For the empirical analysis, we differentiate between indicators of resources and agency for empowerment. Our findings confirm horticultural employment indeed increases women's resources including income, the ability to own and sell assets, and mobility. Their reproductive workload is also reduced. Further, female workers are able to transform their increased resources into improved agency or capabilities (proxied using women's input into household decision making). Overall, these findings confirm what recent studies have identified regarding the role of horticultural employment for women (Maertens and Swinnen, 2012; Said-Allsopp and Tallontire, 2015). Pathways of employment leading to women's empowerment may be related to higher incomes, trainings and knowledge gained on large-scale plantations that can be utilized in daily life. Also, the exposure to different mindset and ways of thinking – fostered by workers collective bargaining and labor unions contribute to empowering women employees. This research improves and expands on measurements and systematically addresses women's empowerment through a conceptual framework developed by Kabeer which is very closely connected to Sen' capability approach (Kabeer, 1999).

As the quality of employment plays a major role in fostering worker's capabilities, labor regulations and employment conditions are addressed as part of the second research objective. We consider the role of Fairtrade certification towards improving extrinsic and intrinsic employment factors of workers. By differentiating between these two factors, we are able to relate employment to

fundamental capabilities (like income generation) as well as those associated with psychological needs (like job satisfaction). We find that Fairtrade enables 40% higher wages for workers and provides and environment in which workers are more satisfied with their job, their co-workers, their job activities and the relationship with their company. Higher levels of job satisfaction are likely driven by higher wages, long-term contractual arrangements, services provided, paid leave, and the ability to collective bargaining through labor unions. Not only workers, but also their households benefit from Fairtrade certification, particularly regarding higher incomes and asset accumulation. Higher wages and the reduction of expenditure needs through free or subsidized service provisions on Fairtrade plantations can contribute to these effects. Further, many Fairtrade certified companies in the Ghanaian pineapple sector provide loans at reduced interest rates, which workers may also use for acquiring assets and other investments. Because we are also interested in the contribution of Fairtrade certification to enhance collective capabilities, we address standard of living indicators that are provided at the village level: access to electricity and clean drinking water. Here again, the effects of Fairtrade are positive. This is possibly related to the contribution of Fairtrade funds (the so-called premium), that is utilized for enabling community health and education projects. Fairtrade companies may also be more inclined to use their bargaining power with the government to ensure provisions such as electricity.

Our findings in chapter III and IV relate to the contribution of Fairtrade certification towards individual and household welfare confirm the ability of standards to promote workers capabilities. The literature on Fairtrade-certified plantations has been very scarce and rather mixed. Our findings only in part confirm those of other studies, which predominantly do not support the relation of Fairtrade to higher wages (Cramer et al., 2014; Granville and Telford, 2013; Ruben and van Schendel, 2009). Standards, including Fairtrade, are in general more related to improved overall working conditions such as employment security, provisions of trainings, and enabling worker organization (Colen et al., 2012; Ehlert et al., 2014; Gibbon and Riisgaard, 2014; Schuster and Maertens (2017), Schuster and Maertens, 2016). This is reconfirmed in our study. To the best of our knowledge, there is no study on job satisfaction on Fairtrade plantations. Also the empirical literature on welfare effects for households employed on Fairtrade plantations is rather thin as most studies focus on the individual worker level. We add to the literature by compiling a unique dataset that allows for comparisons between companies. By accounting for plantation variability, we can better relate Fairtrade certification to welfare outcomes.

2. Limitations and scope for further research

We rely on observational, cross-sectional data and therefore cannot fully account for possible selection bias of workers and companies. Companies voluntarily adopt a standard and workers are free to choose a company they want to work for. This means that there may be unobserved and observed characteristics that differentiate them from the control group. We use econometric techniques to reduce such bias (i.e. IV approaches, entropy balancing, PSM). However, these methods have shortcomings, most especially matching and balancing approaches do not allow for dealing with unobserved heterogeneity. Thus, we cannot completely rule out selection bias. Future evaluations could employ panel data models and methods to reduce such bias. While the compilation of the data set in a specific country context adds to the literature, indeed it represents a case study. Whereas the pineapple sector in Ghana is a good example in the area of vertical coordination of the modern agri-food system, a case study in itself cannot be fully representative of other country's developments and changes. Drawing general conclusions from a case study is therefore difficult and should be done with care. Nonetheless, information derived from our findings regarding the capacity of employment and sustainability standards with a labor focus to generate welfare effects will hopefully contribute to the general research debate. To ensure the validity of our findings beyond the Ghanaian setting, study replications in other sectors and countries are important. Additionally, there is still scope for further unanswered research questions of interest.

Due to the industry's gendered preferences, further research on the implications for women workers is needed. While we evaluate the effects of employment on women's resources and agency, the outcomes and achievements are yet to be assessed. To the best of our knowledge, only two studies address this issue, looking at the educational outcomes of female workers' children (Maertens and Verhofstadt, 2013) and fertility rates (Van den Broeck and Maertens, 2015). Other functionings of interest, such as food and nutrition security, dietary diversity and health impacts have not been studied. Based on the two studies and other related literature, the assumption is that female employment has positive socio-economic implications for the households and their dependents also in the mentioned outcomes (Duflo, 2012; Quisumbing, 2003).

In this dissertation the focus lies on workers on large-scale plantations. A highly understudied area of horticultural employment is the employment of workers on small-scale farms. With engaging in piece-rate or very temporary and seasonal employment, they hardly benefit in any way from labor regulations. Small farms are associated with low and irregular wages as they often ignore labor legislation (Cramer et. al., 2008). Because of their informal activities, not even standards have yet addressed their needs. Assessing the laborers on small-scale Fairtrade-certified coffee farms, Valkila and Nygren (2010) find that they do not benefit from higher labor standards or wages. Against this

background, research of worker welfare on small farms would be beneficial to generating a more comprehensive understanding of rural employment in developing countries.

3. Discussion and policy recommendations

This dissertation shows that the integration of developing countries into modern agri-food systems can enable positive repercussions for rural development. In terms of policy implications, this means that large-scale plantation agriculture can be beneficial for enhancing income generation, poverty reduction and empowerment of the rural poor particularly through the creation of employment opportunities. The restructuring of the rural economy can therefore be considered an essential part of pro-poor economic development (Genier et al., 2009). Particularly in an evolving market, investors, companies and exporters may come together to invest in public services such as infrastructure that the government cannot provide (Deininger and Byerlee, 2012). In Ghana, pineapple companies share costs of cooling facilities at the shipping port in Tema[13]. In addition, new actors and their business approaches can certainly influence the government's engagement with the private sector and its perception of agricultural production in fostering growth (de Janvry, 2009).

The quality of employment however is core to capture its positive effects. Ensuring fair wages, stable contracts, adequate working hours, services and paid leave is imminent to fostering workers basic capabilities. Particularly the stability and permanency of contracts is important for workers to appropriate the eligibility for social security, health care, paid leave and others that are usually only provided to permanent workers. To contribute to capabilities that enable workers' development of self-esteem, empowerment and achievement, work environments should also provide for trainings and collective bargaining. Also, implementation of company projects in worker communities provides an added value for local development. Standards and certifications addressing labor regulations, such as Fairtrade, provide viable mechanisms to achieving such working conditions – particularly in countries with week governance structures that are hardly capable in ensuring that qualitative standards of employment are met.

However, certain framework conditions of the global trading system can undermine the positive effects of certifications, such as Fairtrade. While Fairtrade's vision is that suppliers and buyers engage in long-term relationships built on mutual trust, the reality in global trade arrangements do not necessarily support this objective. Fairtrade buyers are not responsible for engaging in contracts with Fairtrade certified producers. Large retailers control the access to markets and characteristics of agricultural products (Raynolds, 2012). Ultimately this leads to the encouragement of spot market engagement, where Fairtrade producers are unable to foresee the amount of produce sold into the

[13] Information provided by Sea-Fright Pineapple Exporters (SPEG) of Ghana

Fairtrade market, which makes it difficult to plan. There is no guarantee for Fairtrade certified producers to be able to sell (all) produce that meets the certification criteria into the Fairtrade market. Qualitative interviews with agricultural companies in Ghana show that they are only able to sell between 30 – 60% of their produce into the Fairtrade market. This observation is also made in other contexts, for example the Fairtrade coffee market (Omidvar and Giannakas, 2015). Improved coordination and common agreements between suppliers and buyers are crucial to provide sustainable markets for producers in developing countries.

There are other opportunities to promoting labor regulations in absence of governance, albeit potentially weaker ones in comparison to standards. Cooperate social responsibility is one such approach that may foster improved working conditions and socio-economic development of worker communities. Additionally, certain production characteristics may support the provision of adequate working conditions. The choice of crops can reduce the seasonality and flexibility for worker contracts. Either a single crop with year-round production potential or a variety of crops that have different planting and harvesting season and therefore as a whole provide continual employment throughout the year. Again, the overall setting has to be considered. In some cases, the seasonality of export production may indeed be highly valued. This is for example the case for female workers in Senegal, who prefer flexible contracts such as seasonal contracts to adjust their time for other demands such as farming or household reproductive tasks (Van den Broeck et al., 2016).

Overall, while vertical integration of modern agri-food systems can be beneficial for developing countries through employment generation, measures need to be implemented to ensure its quality. Addressing opportunities of achieving full and productive employment also contributes also to achieving the Sustainable Development Goal 8 for the Agenda 2030 that targets the promotion of decent work for all.

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Annex: Survey questionnaire

PART I: To be filled out by worker on commercial pineapple farm (male/ female) or if in non-worker household: by HH Head or Spouse

Household Survey Questionnaire

Dear Respondent! My name is _____. I represent a survey team of University of Göttingen, Germany. We are conducting a survey related about **wage labor in horticultural export production: individual and household welfare effects in Ghana.** Your cooperation in answering these questions is very much appreciated. There are no "right" or "wrong" answers to *any* of these questions and you will not be judged in any way based on your responses. Please answer all questions as accurately and truthfully as possible. The survey will take no more than 2 hours. We assure you that your individual responses will not be disclosed to anyone. **Your responses will be treated as completely confidential and will be used for research purposes only!**

SECTION V. HOUSEHOLD IDENTIFICATION

V1. Name of Enumerator:		V2. Date of Interview:	/ / 2015
V3. Village:		V4. District:	
V5. Region:			
V6. Household Head (Surname):		V7. Household Head (tel. number):	
V8. Household Head (Given name/s):		V9. HOUSEHOLD CODE *(will be entered by supervisor)*	

Question	**Answer**	**Code**
V10. Respondent		1 = HH head / 2 = Spouse / 3 = Joint / 4 = other (specify)
V11. Respondent Surname *(if joint, put in HH head as respondent)*		*If HH head, use code = 1*
V12. Respondent Given name /s		*If HH head, use code = 1*
V13. Respondent tel. number		*If HH head, use code = 1*
V14. What is the respondent's gender?		1 = Male / 2 = Female
V15. What sampling group does the HH belong to? *(will be entered by supervisor)*		1 = Worker and Fairtrade / 2 = Worker and Non-Fairtrade / 3 = Non-Worker

Questionnaire checked by supervisor:		Approved by supervisor (signature):	

SECTION A. HOUSEHOLD SOCIO-ECONOMIC CHARACTERISTICS

A1. Since when has the HH head lived in this village? 1 Since_____(year) 2 Since birth ***>>> skip to A4.***

A2. Where is the HH head originally from? _____ (region) or _____ (country)

A3. What is the main reason of settling in this village? 1 Work for fruit company 2 Other work opportunity 3 Access to land 4 Study 5 Family reasons

6 Other _____ (specify)

A4. What is the main religion in the HH? 1 Christian-Protestant 2 Christian-Catholic 3 Christian-Pentecostal 4 Seven Day Adventist 5 Muslim

6 Traditional 7 Other _____(specify)

A5. How many people in total are currently living in the household? _____(No.) (*HH members = people incl. children who live, sleep and eat in the household as well as people who lived, slept and are in the household for at least 6 months for at least 3 days a week in the past year)*

A6. How many spouses does the HH head have, that are living in the household? _____(No.)

Please list the HH head and the spouse and all other HH members that are **ADULTS (HH members that are NOT the children or considered the children of the HH Head and Spouse, such as brother, sister etc. of the HH Head or Spouse)**!

A7.	A8.	A9.	A10.	A11.	A12.	A13.	A14.	A15.
HH member	**Given name and surname**	**Age**	**Gender**	**Relation to HH head**	**Marital status**	**What is the highest level of school [NAME] has attended?**	**Can [NAME] read or write English?**	**Does [NAME] own a cellphone?**
ID Code		In years	1 = male 2 = female	RELATE CODE	1 = Married 2 = Single 3 = Separated 4 = Divorced 5 = Widowed	SCHOOL CODE	1 = Cannot read and write 2 = Can write only 3 = Can read only 4 = Can read and write	1 = Yes 2 = No 3 = Other (specify)
1								
2								
3								
4								
5								

6								
RELATE CODE: 1 = HH head / 2 = Spouse / 3 = Son or daughter-in-law / 4 = Brother or sister / 5 = Father or mother / 6 = Niece or nephew / 7 = Cousin / 8 = Grandchild / 9 = Other (specify)								
SCHOOL CODE: 1 = No schooling / 2 = Primary school / 3 = Junior High / 4 = Senior High / 5 = Tertiary Education 1 (Polytechnic, Vocational, Training College) / 6 = Tertiary Education 2 (Undergraduate, Postgraduate) / 7 = Other (specify)								

A16. How many kids **under 5 years** live in the household? _____(No.)

A17. How many children did the wife/spouse **give birth to**? 1st wife:_____(No.) 2nd wife:_____(No.) 3rd wife:_____(No.) 4rth wife:_____(No.)
(Note: if you are talking to a women, enter HER children and those of the other wives if applicable)

A18. How many children survived (after the age of 5 years)? 1st wife:_____(No.) 2nd wife:_____(No.) 3rd wife:_____(No.) 4rth wife:_____(No.)

SECTION B. CHILD EDUCATION

In the following table, please provide information about all **children** that currently live in the household (dependents of the HH Head and Spouse, that are cared for whether blood related or not *(in this table ALSO put in children that are not in school)!*

B1.	B2.	B3.	B4.	B5.	B6.	B7.	B8.	B9.	B10.
HH member	**First name**	**Age**	**Gender**	**What is the highest level of school [NAME] has attended so far?**	**Can [NAME] read or write?**	**Can [NAME] add and subtract?**	**What degree do you aim for [NAME] to eventually achieve?**	**Is [NAME] enrolled into school this year?**	**If no, What are the main reasons for not enrolling [NAME] into school?** *(Let them answer freely! Answer question, then >>> **Section C**.)*
ID Code		Years	1 = male 2 = female	1 = No schooling 2 = Kindergarden 3 = Primary school 4 = Junior High 5 = Senior High 6 = Tertiary Education 1 (Polytechnic, Vocational, Training College) 7 = Tertiary Education 2 (Undergraduate, Postgraduate) 8 = other (specify)	1 = Cannot read and write 2 = Can write only 3 = Can read only 4 = Can read and write	1 = Yes 2 = No	1 = No schooling 2 = Primary school 3 = Junior High 4 = Senior High 5 = Tertiary Education 1 (Polytechnic, Vocational, Training College) 6 = Tertiary Education 2 (Undergraduate, Postgraduate) 7 = other (specify)	1 = Yes ***>>> B11.*** 2 = No	1 = studies are finalized 2 = unable to pay school fees 3 = problem of transport/ distance to school 4 = bad grades/ learning difficulties 5 = no interest/ lack of motivation 6 = domestic chores in HH 7 = farm work in HH 8 = marriage/ pregnancy 9 = offered employment 10 = health problems 11 = attends Koran school 12 = other (specify)

In the following table, please provide more information about the children **that go to school** of the household**!**

B1.	B11.	B12.	B13.	B14.	B15.	B16.	B17.	B18.	B19.	B20.	B21.
HH member	**If yes,**						**In the past term, how much did you spend on…**				
	What school year (grade) is [NAME] attending?	**How many days was [NAME] absent from school last month?**	**If absent > 0, what are the main reasons for absence?** *(Don't read out, but let respondent answer freely)*	**What is the distance to [NAME's] school?**	**How does [NAME] travel there?**	**Please tell us about [NAME]'s grades during the school year. Overall, across all subjects, what grades does [NAME] get?**	**school fees**	**examination fees for [NAME]?**	**For uniforms for [NAME]?**	**For textbooks and stationary for [NAME]?**	**For Parent-Teacher Association Dues for [NAME]?**
ID Code *(Fill out ID Codes from above table for those who go to school)*	Year 1 – 12 *(1 – 6 in primary education, 7 – 9 in junior high, 10 – 12 in senior high,* ***12+ University or college student >>>Section C)***	Number of days *(Exclude holidays)*	1 = watch siblings 2 = housework 3 = farm work 4 = problem of transport/ distance to school 5 = bad grades/ learning difficulties 6 = no interest/ lack of motivation 7 = health problems 8 = absence of teacher 9 = others (specify)	1 = ____km 2 = ___min	1 = on foot 2 = by bicycle 3 = by bus 4 = other (specify)	1=Mostly A's/ 1 / Excellent, very good 2 = Mostly B's / 2 / Good 3 = Mostly C's / 3 / Credit 4 = Mostly D's or lower / 4 or lower / Pass, fail	1 = Provided for free 2 = _____ GH₵ 3 = Lump sum *(write across the applicable columns)* 99 = Not applicable				

SECTION C. HEALTH

C1. Which of the following items does the household use for hand washing? 1 Bar soap 2 Detergent (powder, liquid, paste) 4 Only water 5 Nothing

6 Other_____ (specify)

C2. Does the majority of the HH use a mosquito net for sleeping underneath? 1 Yes ***>>> C4.*** 2 No

C3. If no, why not? 1 Too expensive 2 Doesn't see the sense in it 3 Its damaged 4 Don't know where to buy one 5 Other _____ (specify)

C4. How many of the children in your HH are vaccinated against the following? *(Note: If you are talking to the HH Head and he does not know the answer to this question, ask the spouse again within her part of the questionnaire)*

1. Polio: _____(No.) 2. Diphtheria: _____(No.) 3. Measles: _____(No.) 4. Whooping cough: _____(No.) 5. Tetanus: _____(No.)

6. Tuberculosis:_____(No.) 7 Did not receive any vaccines 8 They received some vaccines, but don't know which ones 9 Other _____(specify)

C5. Has anyone in your Household been diagnosed with **non-chronic illnesses/ conditions in the past 12 months**? 1 Yes 2 No ***>>> C11.***

(Please refer to the HH ID Codes! If HH members have been sick more often with the same or different illness, list HH Code again in new line for a new illness!)

C6.	C7.	C8.	C9.	C10.
HH member	**What kind of disease did the person suffer from?** *(if more than 1 disease code at a time, list all and use new line for every disease)*	**For how long was [NAME] sick with this disease?**	**In this case, how much had to be paid for medical consultation fees?**	**In this case, how much had to be paid for medicine?**

ID Code	*DISEASE CODE*	No. Of days	1 = Provided for free / 2 = _____ GH₵ /3 = Lump sum *(write across the applicable columns)* / 2 = Did not go to clinic or doctor / 3 = Did not take any bought medicine / 4 = Has health insurance that covered the costs / 5 = Other (specify)	
DISEASE CODE: 1 = Fever, malaria / 2 = Diarrhea / 3 = Stomach ache / 4 = Vomiting / 5 = Flu or cold / 6 = Headache / 7 = Skin problem / 8 = Tooth ache / 9 = Eye problem / 10 = Tuberculosis / 11 = Typhoid / 12 = Pneumonia / 13 = Intestinal worms / 14 = Other (specify)				

C11. Has anyone **in your household** died of a non-chronic illness/ condition **in the past 5 years**? 1 Yes 2 No ***>>>Section D***

C12. If yes, whom? (In relation to HH Head) 1 Son 2 Daughter 3 Son or daughter-in-law 4 Brother or sister 5 Father or mother 6 Niece or nephew 7 Cousin 8 Grandchild 9 Other_____(specify)

SECTION D. LAND PLOTS

D1. Does the household cultivate or own land? 1 Yes 2 No ***>>> D10.***

D2. How many plots does the household cultivate or own? _____ (No.)

Please provide me with more detailed information about the **land plots** of the household!

D3.	D4.	D5.	D6.	D7.	D8.	D9.
Plot ID	**Plot size**	**Since when is the plot being owned or cultivated by the HH?**	**What is the property status of the plot?**	**Land title**	**Who decides about the production on this plot?**	**What is this plot used for?**
	in Acres	Year	1 = Purchased 2 = Inherited (family) 3 = Inherited (spouse) 4 = Agreement with land/use rights owner 5 = Borrowed temporarily 6 = Rented temporarily 7 = Other (specify)	1 = Freehold 2 = Leasehold 3 = Customary rights 4 = Other (specify)	1 = HH head 2 = Spouse 3 = Jointly 4 = Other *(use HH ID or specify if no HH member)* 5 = n.a.	1 = Cash crop production 2 = Food crop production 3 = Pasture 4 = Fallow 5 = Rented out 6 = Livestock production 7 = Housing plot 8 = Other (specify)

D10. Would the household like to buy/ rent (more) land? 1 Yes 2 No ***>>> D12.***

D11. If yes, is it possible to buy/ rent land? 1 Yes ***>>> D13.*** 2 No

D12. If no, why not? 1 Not enough money available 2 No land available 3 Other _____ (specify)

D13. During the last 20 years did your household transfer, return or lose usage rights for any of the household's agricultural lands? 1 Yes 2 No ***>>> Section E.***

If yes, please mention the individual agricultural plots that the HH transferred, returned or lost usage rights for!

D14.	D15.	D16.	D17.	D18.	D19.
Plot ID	**Plot size**	**What year was the plot transferred/ returned or lost?**	**Who uses the land now?**	**Did the HH receive compensation?**	**How much was the compensation?**
	in Acres	Year	1 = No one / 2 = Family / 3 = Other farmer / 4 = Agricultural company / 5 = Other (specify)	1 = Yes 2 = No ***>>> Section E.***	in GH₵

SECTION E. AGRICULTURAL PRODUCTION

E1. Does any HH member go fishing regularly or practice aquaculture? 1 Yes, for home consumption 2 Yes, for sale 3 Both 4 No ***>>> E3***.

E2. If the HH sells fish, how much did the HH make from selling fish **last month**? _____(Income in GH₵)

E3. Does the household produce agricultural crops **either for sale** or **home consumption**? 1 Yes 2 No ***>>> Section G.***

Please provide the following details on all crops grown by the household in the **last season!** *(If the crop has been planted, but not harvested yet, ask for the season before the current one!)*

	E4.	E5.	E6.	E7.	E8.	E9.	E10.	E11.	CROP CODE	CROP CODE
	Name of crop	**Total area planted**	**Quantity harvested**	**Is crop only produced for home consumption?**	**Quantity sold**	**Average price/ kg**	**Time of harvest**	**Who is responsible for this crop?**	1 = Maize 2 = Rice 3 = Millet 4 = Cassava 5 = Plantains 6 = Cocoyam 7 = Yam 8 = Sweet Potato 9 = Taro 10 = Pineapples 11 = Banana 13 = Pawpaw 15 = Watermelon 16 = Orange 17 = Mango	21 = Pepper 22 = Mushroom 23 = Squash 24 = Carrot 25 = Cabbage 26 = Okra 27 = Ginger 28 = Turkey berries 29 = Cowpea 30 = Groundnut 31 = Cocoa 32 = Coconut 33 = Cashew 34 = Oil palm 35 = Rubber
	CROP CODE	In Acres	1 = ___kg 2 = Planted but not yet harvested	1 = Yes ***>>>E10*** 2 = No	kg	GH₵	Months (1-12) (1 – Jan, 2 – Feb, 3 – March etc.)	1 = HH head 2 = Spouse 3 = Jointly 4 = Other *(use HH ID or specify if no HH member)*		
1										
2										
3										
4										

5									18 = Onions 19 = Tomatoes 20 = Ayoyo	36 = Other (specify)
6									1 = Maize 2 = Rice 3 = Millet 4 = Cassava 5 = Plantains 6 = Cocoyam 7 = Yam 8 = Sweet Potato 9 = Taro 10 = Pineapples 11 = Banana 13 = Pawpaw 15 = Watermelon 16 = Orange 17 = Mango 18 = Onions 19 = Tomatoes 20 = Ayoyo	21 = Pepper 22 = Mushroom 23 = Squash 24 = Carrot 25 = Cabbage 26 = Okra 27 = Ginger 28 = Turkey berries 29 = Cowpea 30 = Groundnut 31 = Cocoa 32 = Coconut 33 = Cashew 34 = Oil palm 35 = Rubber 36 = Other (specify)
7										
8										
9										
10										
11										
12										
13										
14										

SECTION F. EXPENDITURES

What were the expenditures for agricultural production within the **last season**? *(If no costs put in 0!)*

F1. For **seeds** (if not produced by HH)? _____ (Total costs in GH₵)

F2. For **fertilizer**? _____ (Total costs in GH₵)

F3. For **manure** (if not produced by HH)? _____ (Total costs in GH₵)

F4. For **pesticides** (incl. herbicides, fungicides)? _____ (Total costs in GH₵)

F5. For **livestock feed**? _____ (Total costs in GH₵)

F6. Costs to **rent machinery**? _____(Total costs in GH₵)

F7. Costs to **rent an oxen/ animal**? _____(Total costs in GH₵)

F8. Costs to **rent land**? _____ (Total costs in GH₵)

F9. Cost of **operation for own machinery** (fuel, maintenance)? _____ (Total costs in GH₵)

F10. Cost for transport? _____ (Total costs in GH₵)

F11. **Other** costs (e.g. packaging/specify)? _____ (Total costs in GH₵)

F12. Did you hire farm laborers to work on your plots during the **last season** *(If the crop has been planted, but not harvested yet, ask for the season before the current one!)*?

1 Yes 2 No ***>>> Section G.***

If yes, please provide information about the labor you hired for farm work during the **last season**!

CASUAL WORKERS:

F13.	F14.	F15.	F16.		F17.	F18.	F19.
Did you hire any casual workers for the following activities? (list every individual activity in a separate line)	**How many casual workers did you hire?**	**Where they men or women?**	**How much was each person paid for the activity?** *(if only paid as lump sum, move to next column)*		**How high was the lump sum you paid for the activity?**	**Did you have any other expenses for the workers?**	
1 = For spraying 2 = For pruning 3 = For harvesting 4 = For weeding 5 = Other (specify)	Put in **Number** 88 = Don't know	1 = Men 2 = Women 3 = Both 4 = Don't know	Amount	1 = in GH₵ 2 = in kind (specify)	in GH₵	in GH₵	1 = For food 2 = For accommodation 3 = For insurance 4 = Other (specify)

PERMANENT WORKERS:

F20.	F21.	
Do you employ a more permanent worker/ farm hand/ farm manager?	**What did this person receive during the last season?**	
1 = Yes, lives with HH 2 = Yes, but does not live with HH 3 = No 4 = Other (specify)	Amount	1 = in GH₵ 2 = in kind (specify)

SECTION G. HOUSEHOLD INCOME SOURCES

Please provide additional information on economic activities (apart from farming) of HH members in the **past 12 months**! *(If a HH member has more than 1 job or enterprise, use 1 line for each job and fill in his/ her HH ID in each line!)*

G1.	G2.	G3.	G4.	G5.	G6.	G7.	G8.	G9.	G10.	G11.
HH member	**Occupation/ Type of work**	**For how many years has [NAME] been doing this work?**	**On average, [NAME] works in this jobs how many**			**If employed, …** *(Occupation codes: 2, 3, 4)*			**If self-employed,** *(Occupation code: 5)*	
			Hours per day?	**Days per month?**	**Months per year?**	**…. what is [NAME's] status?**	**… how high is [NAME'S] salary?**		**What is [NAME's] general expenditure in an average month for the business?**	**Total income per month on average?**
ID Code	1 = Paid employment off-farm (civil service, private company) 2 = Paid employment on other HH's farm 3 = Paid employment for fruit company 4 = Self-employed/ business (e.g. driver, kiosk, hair dresser) 5 = Unemployed (incl. housewife/houseman) 6 = Other (specify)	Years				1 = Casual 2 = Temporary 3 = Permanent	GH₵	1 = per day 2 = per hour 3 = per week 4 = per month 5 = per crate/box[14] 6 = per acre[15] 7 = per kg[16] 8 = other (specify)	GH₵	GH₵

[14] If salary is paid per crate/ box, how many does the HH member fill per day approx.? _____
[15] If salary is paid per crate, how many ha does HH member finish per day? _____
[16] If salary is paid per kg, how many kg does HH member harvest per day? _____

During the **last 12 months**, did the following sources contribute to the household income? If yes, please indicate the revenue received**!** *(If no costs put in 0!)*

G12. Remittances from **other family members** working outside the HH? _____ (GH₵)

G13. Revenue from **leasing out land**? _____ (GH₵)

G14. Revenue from **renting out machinery**, equipment, vehicles or animals? _____ (GH₵)

G15. Revenue of **renting out house/ apartment**? _____ (GH₵)

G16. Revenue from **sale of forest products** (tree poles, firewood, charcoal)? _____ (GH₵)

G17. **Gift, inheritance** from parents, lottery, prize etc.? _____ (GH₵)

G18. **Sales from HH assets** (land, furniture etc.)? _____ (GH₵)

G19. Government **pension, subsidies** or other transfers from government? _____ (GH₵)

G20. Subsidies or other transfers from **NGOs/ social organizations** _____ (GH₵)

G21. Other, not mentioned above (specify): _____ (GH₵)

SECTION H. ASSETS

Note to enumerator: try to fill out this table by observation as much as possible and only ask those questions that you are not able to observe!

	Question	Answer	Code
H1.	What is the ownership status of dwelling?		1 = Owned / 2 = Provided free by employer / 3 = Provided free by owner / 4 = Rented from private owner / 5 = Rented from govt. or public ownership / 6 = Subsidized by employer / 7 = Other (specify)
H2.	Did you build the dwelling?		1 = Yes / 2 = No / 99 = not applicable
H3.	If yes, when did you built the house?		1 = Year / 99 = not applicable
H4.	How many bed/ living rooms does the house have? (*Note: include detached rooms in same household but not kitchen and bathrooms!*)		Numbers
H5.	What type of roofing material is used in main house?		1 = Brick or stone / 2 = Corrugated metal sheets / 3 = Thatch or palm leaf / 4 = Concrete / 5 = Slate or asbestos / 6 = Tiles / 7 = Other (specify)
H6.	What type of flooring does the dwelling have?		1 = Concrete or cement / 2 = Slate or asbestos / 3 = Earth or mud brick / 4 = Wood / 5 = Stones / 6 = Other (specify)
H7.	What is the main source of drinking water?		1 = Bore hole / 2 = Well / 3 = River or stream / 4 = Pipe inside house / 5 = Pipe outside house / 6 = Dugout or pond or dam / 7 = Other (specify)
H8.	What kind of toilet does the HH use?		1 = Flush toilet / 2 = Pit latrine / 3 = Bucket latrine / 4 = open defecation / 5 = Other (specify)
H9.	When was it built?		1 = Year / 2 = Don't know / 99 = not applicable
H10.	Where is the toilet located?		1 = Inside house (exclusive) / 2 = Inside house (shared) / 3 = Outside house (exclusive) / 4 = Outside house (shared) / 5 = Other (specify)
H11.	Main source of lighting?		1 = Kerosene / 2 = Electricity / 3 = Gas lamp / 4 = Solar energy / 5 = Other (specify)
H12.	Main type of cooking fuel?		1 = Charcoal / 2 = Firewood / 3 = Gas / 4 = Other (specify)

Which of the following assets does the household own?

	H13.	H14.	H15.		H16.	H17.		H13.	H14.	H15.		H16.	H17.
	Asset	**No. owned**	**Year when asset was acquired** *(if several assets, write both the year of first and last acquired assets)*		**Who owns [ITEM]?** *(If more than one item, add ID Code)*	**Who can decide to sell [ITEM]?**			**No. owned**	**Year when asset was acquired** *(if several assets, write both the year of first and last acquired assets)*		**Who owns [ITEM]?** *(If more than one item, add ID Code)*	**Who can decide to sell [ITEM]?**
					1 = HH head / 2 = Spouse / 3 = Jointly / 4 = Other (specify)							1 = HH head / 2 = Spouse / 3 = Jointly / 4 = Other (specify)	
1	Motor vehicle						12	Sewing machine					
2	Motorbike						13	Generator					
3	Bicycle						14	Water Tank					
4	Farm equipm. (non-mechan.)						15	Jewelry					
5	Farm equipm. (mechanized)						16	Cloth (Kente)					
6	TV Set						17	Bank account					
7	Radio						18	Large livestock (oxen, cattle, donkeys)					
8	Satellite dish						19	Small livestock (goats, pigs, sheep)					
9	Fan						20	Chicken, ducks, turkey					
10	Freezer						21	Other:					
11	Gas stove						22	Other:					

SECTION X. HH FOOD CONSUMPTION

What have **you and your household members** eaten and drunk yesterday during the **day and night (24 HOURS)**. *(Let the respondent recall freely about what the household ate and drunk and mark whether food from every specific food group was eaten. Include foods eaten by any member of the household.* ***Probe for snacks and special foods, probe for spices in cooked foods)***

	Food group	*Examples:*	1 = Yes 2 = No
X1.	**Cereals**	corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (e.g. bread, noodles, porridge or other grain products) + Kenkey, Banku, Tuo Zafi etc.	
X2.	**White roots and tubers**	white potatoes, white yam, white cassava, or other foods made from roots like gari	
X3.	**Vitamin A rich vegetables and tubers**	pumpkin, carrot, squash, or sweet potato that are orange inside	
X4.	**Dark green leafy vegetables**	dark green leafy vegetables, including wild forms + locally available vitamin A rich leaves such as amaranth, cassava leaves, kale, spinach, kontomire	
X5.	**Other vegetables**	tomato, onion, garden eggs, green beans, cabbage, etc.	
X6.	**Vitamin A rich fruits**	ripe mango, ripe papaya, oranges, and 100% fruit juice made from these	
X7.	**Other fruits**	Pineapple, banana, watermelon, coconut and 100% fruit juice made from these	
X8.	**Organ meat**	liver, kidney, heart or other organ meats or blood-based foods	
X9.	**Flesh meat**	beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds	
X10.	**Eggs**	eggs from chicken, duck, guinea fowl or any other egg	
X11.	**Fish and seafood**	fresh or dried fish or shellfish, crabs and shrimps	
X12.	**Legumes, nuts and seeds**	dried beans, dried peas, lentils, nuts, seeds, or foods made from these (eg. peanut butter)	
X13.	**Milk and milk products**	Fresh milk, milk power, tinned milk, cheese, yogurt or other milk products	
X14.	**Oils and fats**	oil, fats or butter added to food or used for cooking	
X15.	**Sweets**	sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes	
X16.	**Spices, condiments, beverages**	spices (black pepper, salt), condiments, (soy sauce, hot sauce),	

		coffee, tea, alcoholic beverages	

For each of the following questions I am going to ask you, consider what has happened in the past 30 days (four weeks). Please answer whether this happened and frequency of occurrence on scale, rarely (once or twice), sometimes (3 -10 times) or often (more than 10 times) in the past four weeks. **[Food – staple food, animal, fruits, vegetables etc]**

	Domain	In the past four weeks…….	Occurrence 1=Yes 2=No > Next row	Frequency-of-occurrence: How often did this happen in the past four weeks? 1 = Rarely (once or twice) 2 = Sometimes (three to ten times) 3 = Often (more than ten times)
X17.	Anxiety	Did you worry that your household would not have enough food?		
X18.	Inadequate Quality	Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?		
X19.		Did you or any household member have to eat a limited variety of foods due to a lack of resources?		
X20.		Did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?		
X21.	Less Quantity/ Insufficient Food Intake	Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?		
X22.		Did you or any household member have to eat fewer meals in a day because there was not enough food?		
X23.		Was there ever no food to eat of any kind in your household because of a lack of resources to get food?		
X24.		Did you or any household member go to sleep at night hungry because there was not enough food?		
X25.		In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?		

SECTION Y. INDIVIDUAL FOOD CONSUMPTION AWAY FROM HOME

Y1. During the **past 7 days**, did YOU eat food away from home? 1 Yes 2 No ***>>>Section I.***

If yes, indicate the number of times that food was consumed away from home (in restaurants, chop bars, at food stalls, etc.) in the **past 7 days!**

	Y2.	Y3.	Y4.
Which of the following food items have you eaten away from home in the past 7 days?	**How often did you have this meal?**	**Where**	**Time of day**
	Number of times	1 = Food stall / 2 = Restaurant or chop bar/ 3 = Company canteen / 4 = Other (specify)	1 = Breakfast / 2 = Lunch / 3 = Dinner
Fufu			
Ampesi			

	Y2.	Y3.	Y4.
Which of the following food items have you eaten away from home in the past 7 days?	**How often did you have this meal?**	**Where**	**Time of day**
	Number of times	1 = Food stall / 2 = Restaurant or chop bar/ 3 = Company canteen / 4 = Other (specify)	1 = Breakfast / 2 = Lunch / 3 = Dinner
Kokonte			
Banku			
Kenkey			
Rice			
Beans, Gari and fried plantains			
Wakye			
Omo tuo			
Porridge			
Other:			
Other:			

SECTION I. HORTICULTURAL WAGE EMPLOYMENT

I1. Are you currently employed as casual, temporary or permanent staff in a fruit company? 1 Yes ***>>>I8*** 2 No

I2. In the past, have you ever applied for an agricultural wage labor job at a fruit company? 1 Yes ***>>>I4.*** 2 No

I3. If no, why not? 1 There is no company in this area to work for 2 I rather work for myself than for others 3 Working conditions are too bad 4 Others _____(specify)

I4. In the past, did you get a job at a fruit company? *(**Person doesn't work there any more**)* 1 Yes, as casual staff 2 Yes, as temporary staff 3 Yes, as permanent staff 4 No

I5. If no, why did you not get a job? 1 No work available 2 Not qualified enough 3 Not in good health 4 Don't know 5 Other _____(specify)

I6. If yes, how many years were you employed? _____(years)

I7. What were the main reasons for you to give up this job? 1 Changed employer 2 Finished casual/ seasonal work 3 Quit for family/ personal reasons (pregnancy, ***(after asking this question >>>Section P)***

marriage etc.) 4 Wages too low 5 Insufficient work hours 6 Dismissed by employer 7 Retired

8 Other _____(specify)

	Question	Answer	Code
I8.	What is the name of the fruit company you work for? *(more than 1 possible)*		1 = Gold Coast Fruits / 2 = Bomarts / 3 = Sam Valley / 4 = Jei Rivers / 5 = Golden Exotics / 6 = Koranco / 7 = Tropigha / 8 = Equatorial Ventures / 9 = other (specify)
I9.	What is your main activity in the company?		1 = Planting / 2 = Harvesting / 3 = Packaging / 4 = Field preparation like weeding / 5 = Chemical application / 6 = Sucker management / 7 = Processing / 8 = Technician / 9 = Administration / 10 = Supervisor / 11 = others (specify)
I10.	What is your current employment status?		1 = Casual / 2 = Temporary / 3 = Permanent
I11.	When did you start your employment?		Month/ Year
I12.	How many months have you worked in the past 12 months?		Months
I13.	How many days per month on average?		Days
I14.	How many hours per day on average?		Hours
I15.	Did you work overtime in the last week?		1 = Yes / 2 = No ***>>> I17.***
I16.	If yes, how many hours on average did you work overtime/ extra hours last week?		Hours
I17.	How often is your salary paid out?		1 = Weekly / 2 = Monthly / 3 = Other (specify)
I18.	What is the minimum wage you would work for (*actually get out of bed and do the job – logically it would be lower than what they earn now*)?		GH₵
			1 = per day / 2 = per week / 3 = per month / 4 = Other (specify)
I19.	Are you paid for overtime?		1 = Yes / 2 = I don't work extra hours / 3 = The company does not do overtime / 4 = No / 5 = Other (specify)
I20.	If yes, is this rate higher than the normal rate?		1 = Yes / 2 = No / 3 = Don't know / 4 = Other (specify)
I21.	Everything included, what do you earn within a month on average?		GH₵
I22.	Do you receive other bonuses or extra payments during the year?		1 = Food basket / 2 = In-kind (specify) / 3 = In-cash (specify) / 4 = No / 5 = Other (specify)
I23.	What did you work as before starting your job at the company you currently work for?		1 = None or Unemployed / 2 = Paid employment off-farm / 3 = Paid employment on other people's farm / 4 = Paid employment for fruit company / 5 = Self-employed or own business / 6 = Student / 7 = Farmer / 8 = Other (specify)
I24.	How did you learn about the company and potential job offers there?		1 = Family member / 2 = Friend / 3 = Neighbor / 4 = Village member / 5 = Poster / 6 = Radio / 7 = Contractor / 8 = Company itself / 9 = Community Info Center / 10 = Other (specify)
I25.	Does anyone in your family or social network also work for the same company?		1 = Sister or brother/ 2 = Mother or father / 3 = Aunt or uncle / 4 = Friend / 5 = Neighbor / 6 = Village member / 7 = Husband / 8 = Other (specify)
I26.	How many days of leave are you able to take for 1 year of employment?		1= ____Days ***(if 0 >>>I29)*** / 2= Don't know / 3 = Other (specify)

I27.	Do you take leave?		1 = Yes ***>>> I29*** / 2 = No
I28.	If no, why not? *(Don't read out loud, but let person answer freely!)*		1 = I don't want to take holidays / 2 = I am afraid to lose my job / 3 = I cannot afford a holiday / 4 = I don't know that I am entitled to take leave / 5 = Other (specify)
I29.	Why would you eventually want to quit the company?		1 = For a higher paid job at a different fruit company (specify which one if they know) / 2 = For better working conditions at a different fruit company (specify which one if they know) / 3 = For any other paid job that pays better but not a fruit company / 4 = Start own business / 5 = Start farming / 6 = Go back into farming / 7 = Other (specify)
I30	Do you feel like your HH is better off since you work for the fruit company?		1 = Yes / 2 = No

SECTION J. COMPANY SERVICES

J1. In the last 12 months, how many days have you been on sick leave? *(Put in zero, if none)* _____(days) if zero ***>>>J3.***

J2. What were the main reasons for taking **sick leave**? 1 Work-related accidents 2 Chronic illness (Diabetes, heart disease, cancer etc.) 3 Non-chronic disease (Malaria, Diarrhea, Flu etc.) 4 Family member ill or involved in accident 5 Other _____(specify)

In what way do you use company services?

	J3.	J4.	J5.	J6.	J7.	J8.	J9.
No	**Type of service**	**Is this service offered?**	**Do you use this service?**	**How often do you use this service?**	**How much do you pay for the service?**	**If you don't use service, why not?**	**How satisfied are you with the services provided?**
		1 = Yes 2 = No ***>>>J10.*** 3 = Don't know	1 = Yes 2 = No ***>>>J8***	1 = Daily 2 = Weekly 3 = Monthly 4 = when needed 5 = Other (specify) 99 = not applicable	1 = _____GH₵ 2 = Provided for free/ paid for	1 = Too expensive 2 = Bad service quality 3 = Not needed 4 = Other (specify)	1 = Very satisfied 2 = Satisfied 3 = Neutral 4 = Unsatisfied 5 = Very unsatisfied
1.	Lunch						
2.	Transport from village to farm						
3.	Childcare facilities/ crèche						
4.	Medical care on site						
5	Medical care off-site for myself						
6.	Medical care off-site for HH members						
7.	Social allowance (funeral, wedding, christening etc.)						
8.	Loan availability						

J10. Have you ever been on **maternity/paternity leave** during your employment? 1 Yes 2 No ***>>>Section K.***

J11. If yes, how long before and after giving birth? _____(days before birth) _____(days after giving birth)

SECTION K. TRAINING

K1. Did you receive any kind of training at work in the past 12 months? 1 Yes 2 No ***>>>Section L.***

What kind of trainings have you participated in the **past 12 months**? Please fill out the following table!

	K2.	K3.	K4.	K5.	K6.
No.	**What kind of training did you participate in?** *(Read ALL trainings out loud to interviewee!)*	**How many times did you receive this training during the past 12 months?**	**Do you consider the training useful?**	***If no, why not?*** *(Let them answer freely before you probe!)*	**Where do you apply these contents?**
	1 = General regulations of GLOBALGAP / 2 = General regulations of Fairtrade 3 = Agricultural chemical application / 4 = Usage of protective clothing 5 = Fertilizer application / 6 = Personal and product hygiene 7 = Record keeping, traceability and management skills / 8 = First aid 9 = Product handling – post harvest / 10 = Waste, pollution, environmental mgt 11 = Accident prevention / 12 = Leadership and team leading training 13 = Other (specify)	Number of times	1 = Yes **>>> K6.** 2 = No	1 = I didn't understand / too difficult 2 = I don't know why I should know these things 3 = other (specify)	1 = On household farm 2 = Business 3 = Only within the fruit company I work for
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

SECTION L. COMPANY PROJECTS AND CERTIFICATION

ONLY if worker works in Fairtrade certified company (Bomarts, Golden Exotics, Gold Coast Fruits, Jei Rivers) ask:

L1. Do you know that there is a Fairtrade Premium? 1 Yes 2 No ***>>>L3.***

L2. If yes, how are decisions about the Fairtrade Premium made in your company? 1 By the management/ supervisors 2 By the Fairtrade Premium committee

3 By all workers by vote 4 Other _____ (specify)

	L3.	L4.	L5.	L6.	L7.	L8.
					If the person works for a Fairtrade certified company, ask:	
No	**Do you know about any projects, that your company funded and implements?**	**Did/ does your village benefit from the project?**	**Did/ does your HH benefit from the project?**	**How satisfied are you with this project?**	**Is this project funded by the Fairtrade Premium[17]?**	**Would you prefer that the money used for the project is distributed equally among the workers instead of spending it on the project?**
	Let respondent answer freely, if help needed, mention examples: Payment of school fees for children, Build a library, Nurse training in local hospital 1 = Don't know any 2 = Other (specify)	1 = Yes 2 = No	1 = Yes 2 = No	1 = Very satisfied 2 = Satisfied 3 = Neutral 4 = Unsatisfied 5 = Very unsatisfied	1 = Yes 2 = No 3 = Don't know	1 = Yes 2 = No 3 = Indifferent
1						
2						
3						
4						
5						
6						
7						

[17] The Fairtrade Premium, an additional amount of money based on volumes sold, is distributed to a Fairtrade Premium Committee made up of workers to invest in their communities. The Fairtrade Premium is to be used for community health, education and economic projects.

8						
9						

SECTION M. LABOR UNIONS

	Question		Answer
M1.	If you have a complaint to make, whom do you go to?		1 = Management, supervisor / 2 = Formal labor union representative / 3 = Other (specify) / 4 = No one / 5 = Don't know
M2.	Is there a labor union present at the company you work for?		1 = Yes / 2 = No ***>>>Section N.***
M3.	Are you a member of the labor union?		1 = Yes, since (month / year) / 2 = No ***>>> M5.***
M4.	If yes, why?		1 = Everyone is in the union / 2 = The union fights for better working conditions / 3 = The union fights for better pay / 4 = Other (specify)
M5.	If no, why not?		1 = Unnecessary / 2 = I am afraid of losing my job / 3 = Other (specify) *(Answer question, then **>>> Section N**.)*
M6.	How much is the membership entry fee to be paid to the labor union?		1 = ____GH₵ / 2 = Deducted from wage / 3 = Other (specify)
M7.	How much are the dues to be paid to the labor union?		1 = GH₵ per month / 2 = GH₵ per year / 3 = GH₵ per quarter / 4 = There is no membership fee / 5 = Deducted from wage / 6 = Other (specify)
M8.	Do you need authorization to join a labor union from your company/ supervisor?		1 = Yes / 2 = No

M8. Please listen to the following statements. Please rate on a scale whether you agree to them or not!

No		Statement	Answer *(Please circle)*	
1	Success in collective bargaining	The labor union ensures that I receive reasonable benefits and wages.	1 2 3 4 5	1 = Strongly agree 2 = Agree 3 = Indifferent 4 = Don't agree 5 = Strongly disagree
2		The labor union ensures that I receive the appropriate welfare I desire.	1 2 3 4 5	
3	Unity among union members	The more union members there are in the company, the stronger the labor union is.	1 2 3 4 5	
4		To be confident in the union, makes the union stronger.	1 2 3 4 5	

SECTION N. CORPORATE IDENTIFICATION AND JOB SATISFACTION

When it comes to your job and the working environment, do you agree with the following statements?

No		Statement	Answer *(Please circle)*	
N1.	Job satisfaction	How do you feel about your job?	1 2 3 4 5	1 = Very satisfied 2 = Satisfied 3 = Indifferent 4 = Dissatisfied
N2.		How do you feel about the people you work with – your co-workers?	1 2 3 4 5	
N3.		How do you feel about the work you do in your job – the work itself?	1 2 3 4 5	

N4.		What is it like where you work – the physical surroundings, the hours, the amount of work you are asked to do?	1 2 3 4 5	5 = Very dissatisfied
N5.		How do you feel about what you have available for doing your job – I mean equipment, information, good supervision, and so on?	1 2 3 4 5	
N6.	Organizational Identification	I am proud to be an employee of this company.	1 2 3 4 5	1 = Strongly agree 2 = Agree 3 = Indifferent 4 = Don't agree 5 = Strongly disagree
N7.		I am glad I chose to work for this company rather than another company.	1 2 3 4 5	
N8.	Organizational climate	This company tries to look after/ cares for its employees	1 2 3 4 5	
N9.		This company tries to be fair in its actions towards employees	1 2 3 4 5	
N10.	Employee empowerment – perceived control	I can influence decisions taken in my work team.	1 2 3 4 5	
N11.		I have the authority to make decisions at work	1 2 3 4 5	
N12.	Employee empowerment – perceived competence	I have the capability and competence to do my job well.	1 2 3 4 5	

P18. In general, are you satisfied with your life?

7 Vey unsatisfied — 6 Unsatisfied — 4 Neither satisfied nor unsatisfied — 2 Satisfied — 1 Very satisfied

PART II: TO BE FILLED OUT FEMALE WORKER OR SPOUSE

If you are interviewing a FEMALE WORKER, continue the interview with SECTION P & Q!
If you are interviewing a MALE WORKER, continue the interview with THE SPOUSE. Fill out her contact details in Section W, then continue with SECTION P and Q.

SECTION W. HOUSEHOLD IDENTIFICATION – SPOUSE ONLY

Question	Answer	Code
W1. Respondent		1 = HH head / 2 = Spouse / 3 = Joint
W2. Respondent Surname		
W3. Respondent Given name /s		
W4. Respondent tel. number		
W5. What is the respondent's gender?		1 = Male / 2 = Female

SECTION P. GENDER ROLES AND PERCEPTIONS

No	When decisions are made regarding the following aspects of HH life, how much input/ influence do you have in making decisions about…	**How much input did you have in making decisions about [ACTIVITY]?** *(Please circle)*	
P1.	…major household expenditures (such as a large appliance for the house or investments)	1 2 3 4 5	1 = No input 2 = Input into some decisions 3 = Input into most decisions 4 = Input into all decisions 5 = Not applicable
P2.	…minor household expenditures (such as food for daily consumption or other HH needs)	1 2 3 4 5	
P3.	…food crop farming (crops that are primarily grown for hh food consumption)	1 2 3 4 5	
P4.	…cash crop farming (crops that are grown primarily for sale in the market)	1 2 3 4 5	
P5.	…non-farm economic activities (small business, self-employment, buy and sell)	1 2 3 4 5	
P6.	…wage and salary employment (both agricultural and other wage work)	1 2 3 4 5	
P7.	…children's education and health	1 2 3 4 5	

P8. In the past 12 months, have you taken a loan or borrowed cash? 1 Yes 2 No ***>>>P11.***

P9. Who did you borrow from? *(More than 1 answer possible)* 1 NGO 2 Informal lender 3 Formal lender 4 Friends/ relatives 5 Group-based micro-finance institution 6 The fruit company I work for 7 The fruit company a family member works for 8 Other _____ (specify)

P10. Who makes the decision about what to do with the money borrowed? 1 HH head 2 Spouse 3 Jointly 4 Other _____ (specify)

No	Travels	If yes, alone or accompanied?	How far is it to this place?	
		1 = Yes, alone / 2 = Yes, accompanied by HH head / 3 = Yes, accompanied by female HH member / 4 = Yes, accompanied by male HH member / 5 = Yes, accompanied by the whole family / 6 = No	Value (km, min depending on what is applicable)	1 = distance (in km) 2 = travel time with motor vehicle (in min) 3 = travel time with bicycle 4 = travel time on foot
P11.	Do you travel to the market in the next town?			
P12.	Do you travel to relatives?			
P13.	Do you travel to health centers/doctor?			

P14.	Do you travel to Accra City?			

P15. Are you an active member of 1 or more of these groups? *(Don't read out loud, but let person answer freely!)*

1 Women's group 2 Agricultural producer's and marketing group 3 Credit/ microfinance group 4 Mutual help/ insurance groups (incl. burial societies)

5 Trade and business associations 6 Civic or charitable group 7 Local government 8 Church group 9 Other _____(specify)

P16. Do you feel comfortable speaking up during labor union meetings/ village meetings/ group meetings to share your point of view?

1 No, not at all comfortable 2 Yes, but with a great deal of effort 3 Yes but with little difficulty 4 Yes, fairly comfortable 5 Yes, very comfortable

P17. Do you feel comfortable speaking up in public to protest the misbehavior of authorities/ supervisors?

1 No, not at all comfortable 2 Yes, but with a great deal of effort 3 Yes but with little difficulty 4 Yes, fairly comfortable 5 Yes, very comfortable

P18. In general, are you satisfied with your life? *(Only ask this question again if you haven't already asked the question)*

7 Vey unsatisfied 6 Unsatisfied 4 Neither satisfied nor unsatisfied 2 Satisfied 1 Very satisfied

P19. Imagine a household with a husband and a wife and children. Do you agree to the following statements?

No	Statement	Answer *(Please circle)*	
1	Men are better at doing business than women	1 2 3 4 5	1 = Strongly Agree 2 = Agree 3 = Indifferent 4 = Don't agree 5 = Strongly disagree
2	Men are better at managing money than women	1 2 3 4 5	
3	When jobs are scarce, men should have more right to a job than women	1 2 3 4 5	
4	If a women earns more money than her husband, it's almost certain to cause problems	1 2 3 4 5	
5	Having a job is a best way for a women to be an independent person	1 2 3 4 5	
6	When a mother works for pay, the children suffer	1 2 3 4 5	
7	Being a housewife is just as fulfilling as working for pay	1 2 3 4 5	

SECTION Q. TIME ALLOCATION

Q1. In the last complete 24 hours, starting yesterday morning at 4 am, finishing 3:59 am of the current day, which activities did you carry out? (*Intervals are marked in 15 min intervals. Let the respondent talk freely but keep the options in mind to remind respondent of the possibilities)*

	Night	**Morning**					**Day**		
	3	4	5	6	7	8	9	10	11
Activity									
	Day					**Evening**			
	12	1	2	3	4	5	6	7	8
Activity									
	Evening								
	9	10	11	12	1	2			
Activity									

1 = Eating, drinking, personal care activities	7 = Domestic chores indoors (food preparation, cleaning, washing clothes)
2 = Agricultural work on own farm (crops, livestock, processing, marketing)	8 = Domestic chores outdoors (fetching water, collecting firewood)
3 = Work for fruit company	9 = Care activities (children, elderly, sick etc.)
4 = Off-farm agricultural work (labor on someone else's farm, but not the own one)	10 = Purchasing activities, services (shopping, health center visits etc.)
5 = Off-farm non-agricultural work (employee, business owner etc.)	11 = Social and community interaction, recreation, leisure and religious activities
6 = Education activities (schooling)	12 = Sleep

Repeater SECTION C. HEALTH

If the HH Head could not answer the question, ask the spouse:

C4. How many of the children in your HH are vaccinated against the following?

1. Polio: _____(No.) 2. Diphtheria: _____(No.) 3. Measles: _____(No.) 4. Whooping cough: _____(No.) 5. Tetanus: _____(No.)

6. Tuberculosis:_____(No.) 7 Did not receive any vaccines 8 They received some vaccines, but don't know which ones 9 Other _____(specify)

(For enumerator: If this part is filled out by spouse, was HH head able to hear interview? 1 Yes 2 No)