Food insecurity in a tobacco growing region in Zambia

by

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A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Doctor of Philosophy
in
Public Health and Health Systems

Waterloo, Ontario, Canada, 2022

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Background: Food insecurity and its related adverse health outcomes continues to be a pressing and growing problem in sub-Saharan Africa even though agriculture is an important part of rural livelihoods. Interventions to increase agricultural productivity especially in rural sub-Saharan Africa coincide with national governments' focus on economic development to prompt profitable participation in the global trade of agricultural commodities such as cash crops. However, the choice to expand cash crop production in rural communities has impacts on local food crop production. This project studies tobacco impacts specifically because it is a non-food cash crop demonstrated to have significant adverse short and long-term environmental and health impacts. Given increasing pressure from transnational corporations to increase tobacco cultivation in sub-Saharan Africa, especially in contexts where food insecurity is prevalent, this study contributes to our understanding of how growing this crop affects food production and women's well-being in sub-Saharan Africa.

Study objective: The study aimed to characterize food insecurity in the context of tobacco growing and describe gender inequalities in smallholder tobacco growing households with specific focus on the different responsibilities that women and men bear for household food access.

Methods: A mixed method approach was deployed, influenced by the assumption that growing challenge of food insecurity reflects complex social processes involving determinants operating at multiple scales. Furthermore, food insecurity affects all members of a community and household in different ways but, as women commonly bear responsibility for ensuring household access to food, gender roles and the experiences of women are important in understanding this phenomenon. Therefore, quantitative and qualitative data were collected and analysed concurrently but separately, then triangulated to investigate general patterns as well as probe unique manifestations of the complex phenomenon that is food insecurity in the context of tobacco growing.

Results: *Study 1* draws on descriptive and linear regression analysis of data from two cross-sectional surveys administered at similar points of years 2020 and 2021. In the first sample, 391 participants comprising tobacco (43) and non-tobacco growers (348) were administered a questionnaire. In the second sample, 116 participants comprising tobacco growers only were surveyed to gain more focused understanding of any interactions between demographic factors, tobacco growing, and food insecurity. *Study 1* found that 55% of households in Sample 1 and 19.8% in Sample 2 were food insecure. Whether a farmer grew tobacco or not (tobacco growing status) was not significantly associated with food insecurity. Age (interpreted as a constraint to the physical labour needed for farming activities) is significantly associated with food insecurity among tobacco and non-tobacco growers. All other determinants considered, the study found that factors that limit agricultural production constitute predictors of food insecurity. Farmers in the study mostly grow maize for household consumption and sell any surplus but it appears that small farm sizes limit productive capacity so that farmers are unable to achieve a balance between sufficient maize for year-round household food access and income for non-food needs (education, healthcare, clothing). Among tobacco growers, the duration that food stores lasted was also found to be associated with food insecurity.

Study 2 draws on quantitative survey among tobacco growers (159 respondents) while *Study 3* draws on quantitative data from the 2020 survey (391 respondents). Both studies 2 and 3 also draw on qualitative data from focus group discussions, FGDs (5 groups; 16 women, 22 men tobacco and non-tobacco growers), and in-depth interviews, IDIs (19, from community, government, academia, and non-governmental organisations). Qualitative data (FGD notes and IDI transcripts) were organized in Excel and NVivo (version 12). These studies investigated the multi-dimensional impacts of tobacco growing as experienced by women and men and sought to determine (i) why

tobacco growing households experience food insecurity and (ii) the gendered social impacts of tobacco growing.

Farmers and other community members expressed mixed opinions about the relevance of tobacco growing to the study area. Some participants offer the opinion that tobacco growing is associated with positive economic and infrastructural development outcomes however, others express concern about the actual viability of this livelihood option given the unfavourable nature of tobacco growing contracts, as well as the labour intensity, nutritional, environmental, and social stresses associated with tobacco growing.

Prevailing gender and development narratives assume that greater control over productive assets should result in greater empowerment for women, and some interventions have specified an allocation of subsidized farming inputs to women. However, this study finds that, due to intra-household cooperation norms, in addition to their labour on tobacco farms, women turn over these productive assets to men. Despite this, women benefit less than men from intra-household co-operation where household efforts are directed to growing a crop like tobacco. In an area where female literacy and autonomy are already low, social norms of family cooperation in executing a livelihood strategy mean that women and girls consider it their duty to marry early as well as contribute all their productive labour to support tobacco growing. Therefore, tobacco growing may be seen as an enabler of harmful cultural practices such as early marriage among adolescent girls.

Significance of the study: Zambia is one of the five biggest exporters of tobacco leaf in Africa because of policy support for tobacco export, and therefore growing, as important drivers of economic growth especially for rural farmers. However, this policy stance conflicts with Zambia's obligations to implement interventions that are fully consistent with the WHO Framework Convention on Tobacco Control (WHO-FCTC) and the Sustainable Development Goals (SDGs), especially Goal 2 to end hunger.

This manuscript makes one of the first contributions that integrates an exploration of tobacco growing with the food insecurity challenge and associated gender-related impacts in Western province, Zambia.

The complex nature of the food insecurity and tobacco growing relationship reinforces the importance of using mixed data to explore processes at multiple scales – global, national, subnational and households. Among the various harms already documented about this livelihood, tobacco growing is also implicated in food insecurity primarily by diverting labour from crops that promote food and nutrition security, and this has additional implications for gender inequalities and harmful practices that affect women. The nature of these interactions necessitates even more study. For instance, it is important to query whether the relatively higher income seen among tobacco growers is due to this crop or whether farmers with more land assets and possibly income from other sources are better able to meet the requirements to become contract tobacco growers. The answer to this query will have policy implications for enabling smallholder tobacco growers to switch to alternative crops. Smallholder tobacco farmers have previously said that they prefer to plant other crops that require less labour yet generate the necessary cash for both food and non-food needs.

Furthermore, ongoing efforts to improve agricultural livelihoods by addressing constraints imposed by climate change, ecosystem limits to development, and access to agricultural inputs will benefit by carefully considering household cooperation norms in the design of agricultural interventions. Gender transformative interventions will support women to participate more authentically in livelihood decisions and processes that influence their health and well-being.

Acknowledgements

I acknowledge the land on which I completed my degree is the traditional territory of the Neutral, Anishnawbe and Haudenosaunee peoples.

The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River.

"*No one who achieves success does so without the help of others. The wise and confident acknowledge this help with gratitude*." – Alfred North Whitehead

My sincere gratitude goes to my supervisor, Dr Craig Janes, whose mentorship and graciousness throughout this journey helped me fulfill this long held dream. I am grateful for your mentorship, support, kindness, and encouragement throughout this process.

I also appreciate other committee members, Drs. Jennifer Liu, Susan Kaai, and Warren Dodd for your guidance, insights, availability, and encouragement; my internal/external examiner, Dr. Andrea Collins, and external examiner Dr. Jeffrey Drope, for serving as examiners despite your very busy schedules.

Thanks to the School of Public Health Sciences: faculty, staff, and graduate students - for the strong sense of community that bolsters all who come to the School. I especially appreciate Carol West-Seebeck for the uplifting messages on your office door that spoke loud and clear even when you were not physically in the vicinity, and the hallway fist bumps when you were.

To my colleagues at the Global Health Research Lab, including Dr. Inonge Milupi, *sosongo o!* ('thank you' in Efik, my indigenous language – I promise you that it is more evocative than its English language translation). You heard and validated my thoughts as they formed and evolved. You offered invaluable advice and shared resources that helped me progress. You inspired with your own accomplishments, and you enriched my journey. Wherever life takes us next, may we continue to find the successes that we dream of and work toward.

I also owe a debt of gratitude to Professor Fastone Goma, Mr. Richard Zulu, Dr. Masauso Phiri, Charity Sytalimi and other colleagues at the Centre for Primary Care Research, Lusaka. This debt also extends to the people of Nkeyema and Kaoma, and to Mr. Michael Sililo. Your collobaration, insights, time and expertise supported me in the planning and execution of this research. This is yours as much as it is mine.

Finally, I appreciate Canada's International Development Research Centre, the Queen Elizabeth Advanced Scholars fund, and the University of Waterloo for funding support throughout this endeavour – for without these resources, I could not have executed this work.

Dedication

I dedicate this work to my beloved partner of life – Dr. Bassey Edet. *Ama esit mi,* your strength of conviction and support were immensely valuable to me throughout this journey. To Ethan and Michael, who would 'check in' with me to be sure I was being mindful to take wellness breaks especially during the most stressful times along the way – *I love you!* Thank you for your sacrifice, love and support. I hope that I have set a good example for you and, since I could not have done this without you being in my corner every single day, I hope that I have made you proud.

My siblings, I love and appreciate you for your prayers and making sure I got moments of laughter now and then. For those who made the leap to expand my local network of support, *sosongo o*! It made it easier to have you nearby. With this milestone, I celebrate you all and honour the legacy of our parents.

I also dedicate this work to God, who inspires the beginning of things and sees to their completion, Your life in me made this possible for You kept me and gave me strength. And to You be all glory and praise both now and forever. Amen.

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Chapter 1

Background

Food insecurity is a persistent challenge in Zambia, where more than half the national population live below the poverty line, with largely rural Western province in the bottom three poorest provinces (Central Statistical Office, 2016). Not surprisingly, in Zambia, about 35 percent of children exhibit stunting [short-for-age] (ZSA et al., 2019), a condition linked to chronic undernutrition and food insecurity (FAO et al., 2018). In Western province, as much as 91 percent of households are engaged in agriculture but about 73 percent of its 1.02 million residents live in multidimensional poverty (Central Statistical Office, 2016, 2018). Apart from national and provincial level data that provide some prevalence estimates on nutritional indicators (ZSA et al., 2019), little is known about food insecurity in Western province. Lubungu and Singogo (2021) refer to surveys implemented by the Scaling Up Nutrition (SUN) in Zambia programme to describe Western province as significantly affected by food insecurity. Flooding is a likely factor as many communities affected by acute malnutrition are in the floodplains of the Zambezi River. The effects of chronic undernutrition from food insecurity are evident in the prevalence of stunting, which affects about 29 percent of children under-five years of age (ZSA et al., 2019).

The purpose of the study is to improve our understanding of the drivers of food insecurity in Western province with specific attention to the area described as important for much food production in the province. Importantly, this area is also a centre for tobacco growing but it was not assessed in the surveys for the Zambia Integrated Food Security Phase Classification (Zambia IPC) (IPC, 2021; Lubungu & Singogo, 2021).

Tobacco growing is linked with persisting poverty as well as other adverse environmental, health and social impacts but its associations with food insecurity have received less attention in the literature. Nonetheless, the association between food insecurity and growing a non-food cash crop like tobacco has been highlighted as an important determinant of health and wellbeing among smallholder farmers (Akhter et al., 2014; Khisa, 2019).

Between 18.4 and 19.6 million people are estimated to reside in Zambia, and 54 percent of them live in rural areas (O'Neill, 2022; *Zambia Statistics Agency, n.d; CIA World Factbook, 2022*). In rural communities, agricultural activities including small-scale trade in food crops constitute the main source of income, with farmers earning average monthly incomes of ZMW 1,943 (ZSA, 2020). In contrast, the Jesuit Centre for Theological Reflection (JCTR) – which undertakes monthly basic needs and nutrition basket assessments in Zambia – estimated that a family of five in Lusaka needed ZMW 9,333 to meets its basic food and nutrition needs in July 2022 (Lusaka Times, 2022). Other studies have used JCTR data to estimate the cost of the basic nutrition basket for a household of five in rural areas as ZMW 3,000 (Lubungu & Singogo, 2021).

Resulting from long standing concerns about food security, investments have been made to boost food crop production in Zambia but in 2020, despite increased crop production in most areas, high food prices made food less accessible. Between July and September 2020, flooding and pest infestation interacted with the economic effects of the COVID-19 pandemic to result in high maize prices (Lubungu & Singogo, 2021). Consequently, approximately 1.4 million people in Zambia were exposed to high levels of acute food insecurity, with most being affected in Luapula, Lusaka, and Western provinces where urgent humanitarian was required to restore livelihoods and alleviate acute malnutrition (Lubungu & Singogo, 2021).

Households become food insecure when they lack sufficient food or resources to procure food sufficient for nutritional needs. In rural agricultural communities, household food insecurity

is associated with insufficient local (or own) staple food production and/or income to buy food from local markets. The low-income levels among rural farmers indicated above illustrates some of the precarity associated with agricultural livelihoods and has implications for people continuing to choose agriculture as a livelihood. However, as most of the rural population has few off-farm employment options, it may be expected that farmers will seek to maximize incomes from their farming activities.

Smallholder farmers in Zambia grow various crops but differentiate between those grown for household access to food and those grown for income. Where the agro-ecological zone favors the cultivation of non-food cash crops such as tobacco, this option has been promoted to smallholder farmers. Much of Western province, Zambia falls within a semi-arid agro-ecological zone experiencing an average yearly rainfall of 600 to 800 mm with a growing season that spans 80 – 120 days, compared with up to 140 days in the more fertile central part of the country (Chikowo, n.d.). Soil characteristics in Western province (acidic, loamy-clay or sandy soils) pose significant constraints on crop production.

However, out of the sixteen districts in Western province, two – Kaoma and Nkeyema – contribute significantly to food production because their agroecological zones are suitable for growing a variety of food crops. The study area is within these two districts, comprised of communities within seventy kilometres west of the Kafue National Park – the oldest and largest of the country's national parks. Consequently, the study area is noted for having more favourable rainfall patterns than other parts of the province, relatively flat arable land with soils assessed as suitable for growing food crops like the staple maize, potatoes, sorghum, cassava, rice, groundnuts and soyabeans. The soils of the area are also assessed as suitable for growing tobacco and importantly, proximity to the national parks bestows an abundance of forest timber resources necessary for curing tobacco. In this area, almost all farmers grow maize primarily for household

consumption then sell any surpluses. Due to cash incentives, a significant number also grow tobacco, a non-food cash crop.

With the active influence of transnational tobacco companies seeking to increase their profits, tobacco growing continues to expand. The impacts of this expansion are unevenly distributed among sub-populations, for instance smallholder farmers who grow under contract to tobacco companies work under unfavourable contract terms that also impact women and children in such households (Ramos, 2018). For instance, children in tobacco growing communities have been shown to have an insufficient number of meals (CTCA, 2013).

It is not clear how tobacco growing affects the roles and responsibilities of women and men in household food access, but women are likely to be more adversely affected because prevailing social norms allocate responsibility for household food access to them. This research can provide greater clarity on any connections between tobacco growing, household food insecurity and how women experience and cope with the burden of food insecurity.

Therefore, the overall research purpose is to determine the extent to which tobacco farming affects household food access and how women and men describe their experiences with food insecurity in a tobacco growing region that encompasses contiguous communities in Kaoma and Nkeyema districts, Western province, Zambia. The findings of this research will contribute to gender-transformative approaches in the development of sustainable agricultural livelihoods that positively impact the health and well-being of people in Zambia and the South African Development Community (SADC).

This research explores the prevalence of food insecurity in a tobacco growing area of a poor, rural province. It aims to determine to what extent food production may be displaced by tobacco growing and aims to describe how women and men experience food insecurity in

communities where tobacco growing is a preferred livelihood strategy. The study aimed to contribute to understanding these risks and constraints by describing the social processes influencing household livelihood decision-making and household food access in the context of contract tobacco growing. This examination also aims to illuminate how gender inequalities are produced in tobacco growing contexts and includes examination of the ways in which national economic policy interacts with household livelihood strategies, gender roles and social relations in the household and community.

1.1 Research questions

In farming communities, it is assumed that households source their food from family-owned farms but surveys have indicated that, compared with other categories of Zambians, smallholder farmers in Zambia spend a greater proportion of household income on food – in Western province, rural households spend 53% of household income on food (Central Statistical Office, 2016) While some of this is attributable to lower household incomes in rural areas compared to urban areas, it is also important to consider the growing preference farmers have for selling their agricultural outputs in order to get cash for food and non-food needs (Mubanga & Ferguson, 2017).

Therefore, the overarching research question for this study is **"How does the cultivation of a non-food cash crop (tobacco) affect food insecurity and household food access?"**

This question implies an assessment of the prevalence of food insecurity in a tobacco growing region as well as an exploration of the gendered impacts of food crop displacement by tobacco. It builds upon current realities in rural agriculture and food insecurity in Zambia and queries the extent to which tobacco farming households experience food insecurity from not growing food or being unable to buy food from local markets. It also queries who is affected by this problem and how.

Thus, this study sets out the following objectives:

1. To characterize food insecurity in the context of tobacco growing in rural Zambia by estimating the prevalence of food insecurity (FI) in this area, determining what factors are associated with household FI and determine the contribution of tobacco growing to FI
2. To explore the reasons why and how farmers in tobacco growing households become food insecure.
3. To describe gender inequalities in smallholder farming households, how they relate to tobacco growing and the experience of household food insecurity.

As a globally traded cash crop, there is an interplay between international and national political, economic and social processes and how a tobacco growing livelihood is enacted at community and household levels. These interconnected processes affect how smallholder farmers will implement livelihood strategies to ensure consistent household access to food. It will also affect women's well-being as their lived experiences are impacted by the overlap between their productive and reproductive roles in household livelihoods and access to food. Therefore, this research attempted a gender-sensitive analysis of the multi-dimensional drivers of food insecurity in a tobacco growing community to expand our understanding of how determinants of food insecurity are shaped by non-food agricultural practices and to offer recommendations that contribute to reversing food insecurity in Africa. The complexities implied by the questions set out in this study informed the deployment of a mixed methods approach.

The rest of this dissertation presents the findings of this study organizing in three major findings papers (chapters four, five and six). Chapter Four draws on quantitative data to present an estimate of prevalence of food insecurity in the study area and discusses those factors found

to be associated with food insecurity. It also briefly addresses the contribution of tobacco growing to this picture, indicating that while tobacco growing households are more likely to not be food insecure, there remains a risk of food insecurity. Chapter Five extends this by drawing on qualitative data to outline how tobacco growing households can become food insecure. Interestingly, whereas quantitative data suggests that food insecurity may not be a significant challenge among tobacco growers, qualitative data suggests specific interactions between tobacco growing and the experience of food insecurity. Chapter Six daws on both qualitative and quantitative data to describe the gender related impacts of tobacco growing that emerged during this investigation.

These three findings' papers are framed by a discussion of the literature and concepts framing this study (Chapter Two), a discussion of the rationale for the methodological approach deployed here (Chapter Three) and a concluding chapter that highlights the key implications of this study (Chapter Seven).

Chapter 2

Literature review and conceptual framing

Global processes of population growth, urbanization and industrialization have increased global food needs and shaped food production, distribution, and access. The overall production of food may be sufficient to meet world food needs but the latest State of Food and Nutrition Security in the World report shows that the hope to reduce the prevalence of hunger and malnutrition is critically threatened (FAO, IFAD, UNICEF, 2021). More people than ever are hungry and at risk of food insecurity. Some of this increased challenge is attributable to the COVID-19 pandemic, however the pandemic may have pushed fewer people into hunger than it did if glocal[1] food systems were not already at risk due to climate change as well as anthropogenic influences on land use and resource allocation such as the value allocated to commodities traded in local and global food systems.

2.1 Defining food insecurity

A common and often used definition states that food security is realized "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (*Rome Declaration on World Food Security*, 1996). In addition to this definition, depending on the resource, several pillars of food security are recognized; these relate to availability, access, utilization, and stability (CFS, 2014; Jones et al., 2013; Swindale & Bilinsky, 2006). *Availability* refers to the existence of enough food in the local food system, whether it comes via local production, trade or aid; the presence of sufficient and appropriate nutrient-rich diets is a necessary component of having *access* to food and is connected to a household's resources (including income) or its ability to

[1] The adjective 'glocal' describes a phenomenon characterized by the interconnectedness of global and local dimensions.

produce food; *Utilisation* refers to the appropriate use of food through food storage and processing shaped by knowledge of the health, nutrition, and sanitation characteristics of food; and to the aforementioned three pillars, a fourth – *stability* – means there are no disruptions to the food system or to food supply owing to natural or man-made crises (CFS, 2014; Swindale & Bilinsky, 2006). The Rome Declaration also affirms food security as a human right but currently, this right remains unrealized for billions of people (Smith, Rabbitt, and Coleman-Jensen, 2017).

Food insecurity, the antithesis of food security, is characterized by three distinct experiences (1) uncertainty about future food availability and access, (2) inadequacy in the quantity and kind of food needed for a healthy lifestyle, or (3) the necessity to get food via socially undesirable methods (Arcury et al., 2001; Hamelin et al., 2002; Quandt et al., 2000; Radimer et al., 1992; Wolfe et al., 2003). A range of metrics and instruments have been developed to assess food insecurity in ways that are responsive to scale, contextual validity, and the pillars of food security mentioned above (Jones et al., 2013). Some instruments are useful for collecting national level aggregate data (e.g., Global Food Security Index-GFSI and the IPC, which also draws from Demographic and Health Survey and Multiple Indicator Cluster Survey data) and others are more useful for assessing household level dimensions. At the household level, instruments have been developed to assess the access and utilization dimensions of food insecurity. The Household Food Insecurity Access Scale, developed by the Food And Nutrition Technical Assistance (FANTA) project for use in low resource settings (Coates et al., 2007) and the Household Dietary Diversity Score (HDDS) have been widely used for food insecurity assessments in Africa. More recently, the Food Insecurity Experience Scale (FIES) has been adopted by the United Nations to assess progress to meeting Sustainable Development Goal 2 – zero hunger (Dudek & Myszkowska-Ryciak, 2020). FIES is comparable to the HFIAS in the domains that it assesses (worry/anxiety, changes in food quality and changes in food quantity) but it uses a different recall period.

Assessments using any of the validated instruments show that food insecurity is worsening in sub-Saharan Africa, where up to half of the adult population experiences moderate to severe food insecurity, and one-quarter suffer from severe food insecurity (FAO, IFAD, UNICEF, 2021) with impacts on nutrition security as well as nutrition-related mortality, morbidity and disability outcomes. Women of reproductive age, infants and young children are the most vulnerable. Malnourished women are more likely to experience birth complications and give birth to low birth-weight children who could die during infancy (Coburn et al., 2015). Due to their physiology and high calorie requirements for growth and development, children are particularly susceptible to the effects of food insecurity and malnutrition as stunting is common in undernourished infants who survive childhood (Drammeh et al., 2019).

Smith and colleagues (2017) describe poverty as a primary driver of food insecurity globally however, poverty is situationally determined so drivers of food insecurity will look different in diverse contexts. In rural sub-Saharan Africa, where agriculture and related tasks dominate livelihoods, poverty in this context is determined by factors affecting agricultural livelihoods and productivity. Rural smallholder farmers provide up to 80 percent of food in parts of sub-Saharan Africa but despite playing a critical role in sustaining local food systems, they are often food insecure due to inadequate food crop stores, lower than optimal incomes from food and/or cash crop sales, and extremely limited off-farm employment opportunities – giving rise to what is known as the ‘hungry farmer paradox’ (Bacon et al., 2014; Sirdey & Lemeilleur, 2021). Therefore, Sustainable Development Goal 2 calls for actions to end hunger while associated targets clarify that these actions must promote sustainable agriculture in rural areas, be protective of food and nutrition security and impact rural development. These actions must account for the needs of rural farmers who also deserve decent livelihoods while they toil to support local food systems.

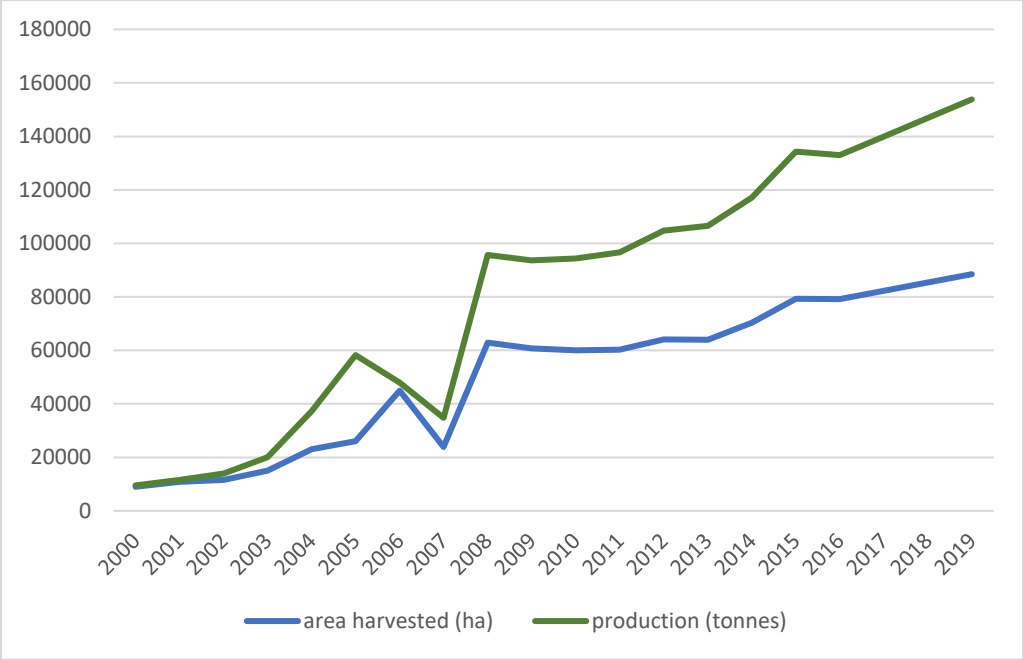
2.2 Tobacco growing trends and impacts in Zambia

The foregoing highlights the need for robust rural economies to reverse trends in rural poverty and hunger, and it is in this context that tobacco growing has been promoted by multinational tobacco companies and tobacco leaf buying companies as the most economically profitable farming activity for rural, smallholder farmers in Africa, with policy makers proffering arguments for the contribution that tobacco growing makes to rural development and poverty reduction (Goma et al., 2017; Labonté et al., 2018; Lencucha et al., 2018). Thus, the Zambian government facilitates an investment environment that encourages the expansion of this livelihood by the tobacco industry focusing primarily on the revenue earning potential of tobacco growing (Labonté et al., 2019). As a result, tobacco growing has expanded in Zambia, making it one of the top five tobacco growing and exporting countries in Africa (WHO, 2015). The volume of tobacco leaf harvest and the proportion of land allocated to tobacco growing have both increased and tobacco leaf exports were worth US$68.5 million in 2019 and US$112.4 million in 2020 (FAO, 2021).

These expansions are driven by the influence of transnational tobacco trade as through smallholder tobacco growing contracts, tobacco industry conscripts rural agricultural labour into its global enterprise, utilizing rural farmland in the global supply chain for this crop (Kibwage et al., 2009; Labonté et al., 2018; Leppan et al., 2014; Otañez et al., 2009). The tobacco industry provides a framework of support (access to credit, inputs and a market) to its contract farmers that is unmatched by national governments or other bodies (Babalola, 1988; Kidane et al., 2015).

Figure 1

Tobacco production trends in Zambia



Source: Author's illustration using FAOSTAT data

Given the increasing precarity of rural agricultural livelihoods, farmers feel constrained to grow crops that have ready markets and income in cash. Farmers rely on the narrative advanced by the tobacco industry and the appearance of profitability created by cash advances to assert that tobacco growing is viable. However, this narrative of economic prosperity is challenged by several studies in multiple low- and lower middle income countries that have refuted the claim of profitability, especially among smallholder farmers (Kibwage et al., 2009; Makoka et al., 2017; Makoka, Appau, et al., 2016; Otañez et al., 2009; Van Minh et al., 2009). These studies have documented persistent poverty among tobacco growers and have also documented deforestation and soil degradation as environmental consequences of tobacco farming (Akhter et al., 2014; Lecours et al., 2012; Mwita, 2012). Deforestation has consequences for rainfall patterns, and this will intersect with degraded soil quality to

negatively impact agricultural productivity, reduce food production and exacerbate food insecurity. Notwithstanding this, among smallholder farmers who choose to grow tobacco, any considerations for short term environmental exploitation and potential long-terms impacts give way to present-day imperatives to feed households as well as pay for non-food goods and services. Furthermore, awareness of the harmful health impacts of tobacco consumption and growing is low in Zambia (Hu & Lee, 2016; ITC Project, 2015; Kaai et al., 2022).

Farmers' profitability equations often fail to fully account for input costs. Smallholder farmers allocate industry-prescribed portions of farmland to tobacco growing and rely on household labour, including women and children, for their tobacco crop output (Akhter, Buckles, & Tito, 2014; Babalola, 1988; Goma et al., 2017). These tobacco growers are more likely than to not devote all their time and/or land tobacco growing in order to meet industry standards in hopes of earning a lot of income after crop sales. However, efficiency studies have demonstrated that when household labour costs are accounted for, most farmers make marginal profit and more commonly incur losses from season to season (Drope et al., 2018; Goma et al., 2017; Kidane et al., 2015; Labonté et al., 2018; Makoka, Drope, et al., 2016; Otañez et al., 2009). Kidane and colleagues (2015) used econometric production function analysis to demonstrate that, though income from tobacco is higher than income from other crops like maize, when corresponding input costs like labour are considered (net income per manpower unit), tobacco growers are less efficient and are better off growing food crops.

In addition to lower efficiency and net economic loss, tobacco demands mono-cropping and extensive agrochemical application resulting in significant adverse environmental impacts on soil quality and ground water (Lecours et al., 2012). Soil degradation and ground water depletion has been associated with food insecurity in countries like Vietnam, Kenya, and

Bangladesh (Leppan et al., 2014; Ochola & Kosura, 2007). Furthermore, the relationship between food insecurity and tobacco growing has been highlighted as an important determinant of health and wellbeing particularly among vulnerable sub-populations (Akhter et al., 2014; Khisa, 2019).

Zambia ratified the WHO Framework Convention on Tobacco Control (WHO FCTC) in 2008 and implemented several articles including banning smoking in public health and educational institutions, indicating that tobacco control is an important policy focus in Zambia (Lencucha et al., 2018). However, little has been done to address WHO FCTC articles 17 and 18[2] to discourage tobacco growing and support tobacco farmers' switch to sustainable alternatives and in providing an enabling environment for the expansion of tobacco growing, it is tacitly encouraging the continued expansion of this livelihood. For instance, in 2021, while farmers of food crops struggled with access to markets during the peak of COVID-19 pandemic, tobacco growers were assured of the purchase of all 36 million kilograms of the crop harvested (Mwansa, 2021).

Smallholder tobacco farmers, especially those in contracts with tobacco companies, complain of the exploitative nature of tobacco growing, indicating their willingness to switch to other crops if viability can be established (Goma et al., 2017; Lencucha et al., 2016; Makoka, Drope, et al., 2016; Ochola & Kosura, 2007). In spite of demonstration projects illustrating the profitability of some food crops (CTCA, 2013; Leppan et al., 2014; Li et al., 2012; Ochola & Kosura, 2007; Prasad, 2007), farmers and policy makers remain concerned about the viability of investing in food crops only. Sustainable approaches to switching out of tobacco consider local knowledge systems, beliefs and norms in mapping the combination of

[2] Article 17 and 18 of the WHO FCTC address issues of alternative livelihoods for tobacco farmers and the protection of the health of workers engaged in the growing and processing of tobacco. These articles obligate countries to promote, as appropriate to local context, economically viable alternatives for tobacco farmers.

resources, assets (material and social), capabilities and activities rural smallholder farmers may deploy to build livelihoods with a cash-food crop mix that is resilient to environmental or structural stresses and protective against food insecurity (Baro & Deubel, 2006; Ellis & Freeman, 2004; Scoones, 2009). In addition to income potential, stakeholders should consider enablers or constraints posed by economic, political and social institutions, gender relations and property rights (Ellis, 1998; Scoones, 2009).

The Zambian government established a Farmer Input Subsidy program, FISP through which it provides inputs such as fertilizers and maize seedlings at subsidized costs to enable rural farmers improve crop production and scale from smallholder farmers to semi-commercial or commercial farmers (Goma et al., 2017; Mason & Tembo, 2015; Mubanga & Ferguson, 2017). It does this even as it grapples with multiple other priorities: the need to earn foreign exchange, reduce rural poverty and abide by commitments to sustainable development which include strengthening progress in gender equality (Kulik et al., 2017). Kulik and colleagues (2017) have linked reducing tobacco supply to the attainment of multiple Sustainable Development Goals (SDGs) and this analysis can be strengthened by identifying how opportunities offered by this perspective might result in gender transformative outcomes for women in rural Zambia and similar contexts.

2.3 Development, rural livelihoods in tobacco, and the sustainable livelihood framework

In the late 1990s, development debates coalesced with global social movements to challenge the neo-liberal economic formulas of the World Bank and the Washington Consensus, demonstrating persisting poverty and declined capacities in developing countries (Scoones, 2009). The sustainable livelihoods framework emerged as one response to uneven outcomes of development, calling for reconsidered poverty reduction programming in rural agricultural communities using approaches grounded in local knowledge systems, beliefs, norms and assets (Ellis & Freeman, 2004; Scoones, 2009).

The sustainable livelihood framework (SLF) has been applied in one form or another for almost a century but about three decades ago, development agencies began applying the SLF to livelihood analyses among rural farmers, mapping the combination of resources, assets (material and social), capabilities and activities deployed by rural farmers to earn a living that is resilient to environmental or structural stresses (Baro & Deubel, 2006; Ellis & Freeman, 2004; Scoones, 2009). SLF also incorporates household well-being as a feature of sustainable livelihoods (Scoones, 2009).

Livelihood interventions often focus on the sustainability of household sources and production of cash and/or in-kind income, but beyond income, livelihoods' resources encompass social institutions, gender relations and property rights (Ellis, 1998; Scoones, 2009). This is an important feature because gender-differentiated outcomes are observed in rural livelihoods' trajectories especially when these are connected with development and globalization processes (Everett & Charlton, 2014; Razavi & Miller, 1995). In the SLF, the unit of analysis is the household, yet this apparently simple unit conceals dimensions of gender and power relations and how these influence enacted livelihood strategies. For example, property ownership and social

rules on permissible courses of action for women affect the livelihood strategies available to women compared with those of men (Ellis, 1998).

In the study context, uneven power relations observed between tobacco leaf buying companies and tobacco growers may be said to also reflect the unequal power dynamics observable within households. The reduction, and in some cases, elimination of agricultural subsidies following the implementation of structural adjustment programmes (SAP) in Africa as recommended by the Washington Consensus meant that the cost of sourcing farming inputs from the private sector became too expensive for smallholder farmers. Concurrently, the influence of neoliberal economic policy rose with one consequence being farming households concentrating production efforts on cash crops like tobacco, prioritized for export markets and allegedly for rural economic development (Labonté et al., 2018) instead of food crops for local markets and household consumption. Globalization processes allowed transnational tobacco companies into agricultural sector of countries like Zambia, and to capture market share, these companies took advantage of the gaps left by governments in the provision of credit and extension services (Leppan et al., 2014).

However, transnational tobacco companies operate an asymmetrical power dynamic felt at macro- and micro-levels. At the national level, powerful tobacco industry lobbying interferes with government's ability to regulate tobacco growing (Labonté et al., 2019). At the farm level, studies have indicated that farmers have little to no influence on how crops are assessed, graded and priced (Labonté et al., 2018; Makoka et al., 2016). Tobacco growers have reported on the intense effort needed to meet industry-specified standards for cured leaves and the frustration experienced when their efforts do not yield the expected grade and price at harvest time. In households where tobacco farming is prioritized for income, these higher level structural processes as well as social rules around property ownership, family collaboration, female autonomy and women's reproductive

roles intersect to constrain choice in women's exercise of productive labour (Carr, 2008) This is turn has implications for household food security and well-being, domains traditionally assigned to women (per reproductive labour norms). This study aims to fill a gap by literature by studying how these constraints are experienced and how they shape gender inequalities.

For this study, the potential strengths of the Sustainable Livelihoods Framework (SLF) are amplified by aligning with gender and development (GAD) framing to go beyond what other studies have done in identifying women's tasks versus men's tasks in tobacco farming (Hu & Lee, 2016). It attempts to account for gender and power relations in the negotiations that influence intra-household production as recommended by Ellis (1998). Among the intersecting concepts of GAD and SLF, a predominant common thread is the analysis of social and power relations between women and men, and between people of greater power and those of lesser power. In the farming systems of many rural sub-Saharan African communities, male influence affects how household livelihood strategies are enacted (Carr, 2008). An analysis of livelihoods through a gender equality lens can highlight how patriarchal structures across all levels influences livelihood choices in remote communities in rural sub-Saharan Africa and provides a way to represent the constraints and options affecting women's experiences.

Creating transformative opportunities for rural women in farming households requires engagement with social institutions to influence how individual and household agency is exercised towards development (Ellis & Freeman, 2004) but this remains the challenge for development scholarship and practice. For this study, GAD/SLF framing is applied to analyze micro- and macro-level social relations and structures in the intersections between gender, development and livelihoods in tobacco growing communities of rural Zambia. This analysis has implications for re-conceptualizing social and political structures so that women have equitable access to resources

and opportunities to attain their development goals in rural Zambia and similar communities in southern Africa (Razavi & Miller, 1995).

2.4 Gender considerations in sustainable alternatives to tobacco growing

The conceptual framing of this research was influenced by critical gender and development discourse that prompts awareness of the fact that development outcomes are not gender-neutral (Everett & Charlton, 2014; Jerneck, 2015).

Research on the adverse impacts of tobacco growing require an explicitly gendered analytical lens to show how these adverse consequences differentially impact women. Considerations of the gender and tobacco intersection have so far emphasized tobacco consumption, and though it has been recommended, this focus inadequately captures risks and constraints to women arising from tobacco growing (Arcury & Quandt, 2006; Greaves et al., 2006; von Eichborn & Abshagen, 2015). For instance, women may have significant negative experiences when tobacco growing displaces subsistence farming (von Eichborn & Abshagen, 2015). If the cash earned from tobacco is insufficient to, or not used to replace lost food production, household food security is threatened, and women may adopt harmful coping practices to mitigate risks of food insecurity.

Farmers expect their livelihoods to provide a sustainable level of income, but in a context of precarity, smallholder farmers are eager to earn income from whatever source they can. Thus, they are attracted to tobacco growing due to ready cash offered by tobacco companies as part of contract growing conditions. Drawing on neoliberal economic principles that advocate minimal government involvement in market regulation, tobacco companies lobby the government to allow the expansion of tobacco growing with minimal regulatory oversight. They claim that tobacco growing is key to national economic growth while tobacco

control is inimical to the same objective (Lencucha et al., 2018). This creates conditions that favour tobacco growing over growing food crops (Ellis, 1998; Labonté et al., 2018; Wood et al., 2013).

Women are affected by these conditions. Describing conditions in African family farming systems and in tobacco growing (Babalola & Dennis, 1988; Bennett, 2008; Carr, 2008; Greaves et al., 2006; Hu & Lee, 2016; Radel, 2011; Reis et al., 2017; Riquinho & Hennington, 2012), studies have indicated that in out-grower tobacco households, the requirements of contract tobacco schemes intersect with pre-existing social rules around property ownership, family collaboration, and female autonomy. Contract tobacco growers are required to own sufficient land, have access to timber resources and sufficient labour to enable them to grow the crop. As women are rarely landowners in Zambia but work on family farms, women's work in tobacco growing may be said to be constrained by the structural determinants earlier described.

Furthermore, the long hours required in tobacco growing increases women's labour burdens while failing to deliver commensurate income benefits. Fiona and Mackenzie (1999) have described how women have more autonomy over their productive labour and incomes when growing food crops. On the other hand, when farming households focus on cash crops like tobacco, women have less autonomy and fewer opportunities to invest in other economic activities (Babalola, 1988; Babalola & Dennis, 1988; Heald, 1991). During tobacco growing, women work in the planting and harvesting phases but are excluded from the marketing phase where financial exchanges occur (Babalola, 1988; Babalola & Dennis, 1988). One objective of this study was to describe how this exclusion creates or perpetuates gender-based inequities.

Chapter 3

Methodological considerations

Understanding complex social phenomena requires the application of appropriate investigative strategies. There are a variety of research study methods that lend themselves to the exploration of social phenomena; some focus on using simplified and aggregated pieces of data, while others engage with complexity by recognising and elaborating on context-specific particulars. Some phenomena, however, raise concerns that cannot be answered with an "either-or" approach, necessitating a research strategy that looks for patterns to illustrate a basic principle while also recognising distinctive expressions of a social phenomenon. Researchers from various disciplines have long advocated a departure from singular approaches to research studying human social processes, recognising that a range of factors influence the expression of observed outcomes. These outcomes can be different for as many people as are affected by the social process in focus. The goal of this chapter is to outline the rationale for applying a mixed methods research strategy to investigate the health and social consequences of tobacco growing in rural Zambia, specifically those related to food insecurity. Furthermore, it will describe what and how selected methods were used as well as briefly discuss some limitations of this strategy.

3.1 Overview of mixed methods research

The research process encompasses research design, questions formulation, methods selection for primary and/or secondary data collection, analysis, and presentation of research findings. Decisions about the entire research process are influenced by our assumptions about the nature of people's reality and how we access knowledge about it. These influences inform how we distinguish between "methodology" as a philosophical framework and "methods" which may be

simply interpreted as a range of techniques used to sample, collect, and analyse data, rather than using both terms interchangeably (Creswell & Plano Clark, 2007).

Researchers bring various epistemological biases to their research process and traditionally, quantitative and qualitative research approaches use specific paradigmatic lenses that have been cast as diametrically opposed (Small, 2011). Creswell (2014) explains that quantitative methodology proceeds from a positivist worldview which insists that there are essential elements to the nature of social phenomena, and these may be understood by objective research processes. Data are collected and aggregated from a statistically representative sample and inferences made through deductive analysis. Yet, quantitative methodology often falls short of engaging with findings that are outside the curve of normal observations and therefore, it is limited in its representation of the complexity of real life. On the other hand, qualitative methodology draws from an interpretivist worldview that demands researcher immersion in and interaction with complex social phenomena. Researchers may be participant or non-participant observers but consistently apply a lens that seeks to understand the diversity of experiences and interpretations implicated in the social phenomena under consideration. The qualitative research approach often uses purposive sampling techniques to identify cases of interest regarding this social phenomenon and uses appropriate designs to facilitate inquiry however, the approach is limited in its capacity to generalize findings across a population.

However, the distinction between quantitative (positivist) and qualitative (interpretivist) paradigms is impractical; instead, both approaches may be considered as part of a research methodology continuum, with mixed methods research (MMR) increasingly accepted as a third methodology along the continuum (Greene, 2008; Small, 2011; Tashakkori & Teddlie, 2003; Venkatesh et al., 2013). Some components of mixed methods research seek out participants' voices as a data source, while others collect and analyse numerical data to answer quantifiable questions

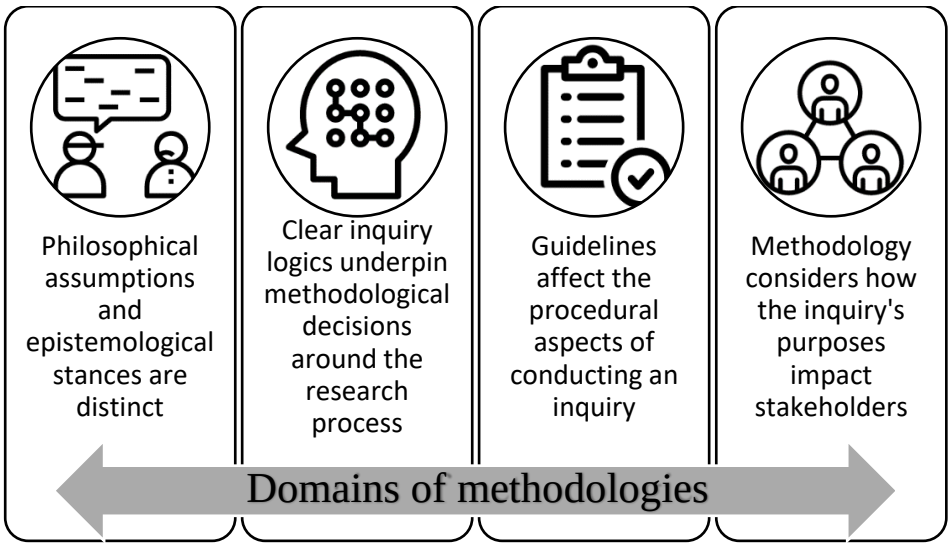
about the nature of a social issue. By combining data in this way, complicated phenomena can be better understood.

Mixed methods research has an underlying philosophical foundation that derives strongly from an assumption that researching complex social processes requires employment of the most effective methods of investigation to both identify common patterns and explain particularities (Collins et al., 2012; Evans et al., 2011; Greene, 2008). Martinez Alvarez and colleagues (2016) present a rationale for using MMR to uncover patterns in development assistance for health (DAH) substitutions in Tanzania as well as explain why this occurred. They demonstrate the volume of DAH reallocation using numeric data and illustrations while also discussing the trend from the perspectives of Tanzanian development aid stakeholders. Therefore, MMR provides opportunities for research inquiry to move between the positivist and interpretivist by allowing researchers to combine both quantitative and qualitative techniques to collect, analyse, and report data, rather than being constrained by the sole use of either a quantitative or qualitative approach (Creswell & Plano Clark, 2007).

It may be complex to think about mixed methods research as a methodology (Creswell and Plano Clark, 2007) but MMR is not merely a technique for data collection and analysis. Neither is MMR merely about combining qualitative and quantitative data. A positivist philosophical approach to research that considers the nature of social reality as objective is not converted to a constructivist approach by undertaking a narrative interpretation of quantitative data collected through an experimental research design (Hancock et al., 2018). As a methodology, MMR fulfills the requirements of four interrelated domains that comprise acknowledged research methodologies, as illustrated in Figure 2 (Collins et al., 2012; Greene, 2008).

Figure 2

Four interrelated domains that comprise research methodologies



Note: these domains constitute a framework for understanding how methodologies differ from methods

3.2 Purpose and designs of mixed methods research

Mixed methods research is useful when there is a need to (a) generate a testable hypothesis about an under-explored problem and then test it, (b) generate important insights about a phenomenon by using different research approaches in combination when one alone would not suffice due to its methodological limitations and, (c) explore diversity or dissonance in the manifestations of a phenomenon (Creswell & Plano Clark, 2007; Greene, 2008, 2012; Small, 2011; Venkatesh et al., 2016).

MMR is valued for its capacity to answer eligible research questions with more robustness than either quantitative or qualitative approaches alone. It mitigates the limitations of quantitative and qualitative approaches used on their own (Creswell & Plano Clark, 2007; Small, 2011). Combining quantitative and qualitative paradigms and data types (numerical, narrative, discourse, imagery) enriches research by providing a foundation for useful inferences about complex social

phenomena that address both breadth (generalizability) and depth (particularities) (Sykes et al., 2018; Teddlie & Yu, 2007).

Scholars have developed several design possibilities for mixed methods research showing they may be exploratory or explanatory, sequential or convergent, embedded or multiphase; with different design types signalling different purposes (Creswell & Plano Clark, 2007; Small, 2011). The purposes may be exploratory – to map the dimensions of a previously under-studied problem, or they may be explanatory – to deepen our understanding of the manifestations of a well recognized social phenomenon. Furthermore, MMR studies may accord greater weight to one or another of the approaches integrated in the study; they may be qualitative dominant, quantitative dominant, or aim to give equal weight to quantitative and qualitative strands of the study or research programme (Creswell & Plano Clark, 2007; Tashakkori & Teddlie, 2003).

For instance, a convergent parallel design has been used to demonstrate how the urban poor in a water-scarce area of Bolivia use reciprocity as a buffer against water insecurity (Wutich, 2011). The research team used multiple regression analysis of survey data to explore correlations between severity of household water insecurity with proximity to the city water source, water storage capacity, and number of reciprocal exchanges. Qualitative data sources were field notes from participant observation. This study effectively illustrates how MMR serves to measure the dimensions of a phenomenon as well as represent its contextual manifestations. The nature of a convergent parallel design means that the quantitative and qualitative arms were executed separately but at the same time and each strand had equal weight in contributing to findings; data was also analysed separately but results were integrated during interpretation of findings. A similar design approach was used in the present study.

3.3 Study design: mixed methods exploration of food insecurity in a tobacco farming region

3.3.1 Paradigmatic foundations

Before outlining the study design implemented for the current research, it is useful to clarify the philosophical assumptions that undergird this study. A number of primary studies have analysed economic, health, and environmental impacts of tobacco farming using a mixed methods design of one type or another (Hu & Lee, 2016; Kibwage et al., 2009; Le et al., 2013; Thanh et al., 2009). Though the methods were clearly described, the reader must deduce the epistemological foundations that supported the selected study design. This has been highlighted as a weakness of the majority of mixed methods research (Alavi et al., 2018; Brown et al., 2015; Evans et al., 2011).

The overall purpose of this study is to determine how tobacco growing affects food crop production in rural Zambia and describe how households (women and men) cope with any challenges posed by tobacco growing (see Chapter 1). This study uses the challenge with food insecurity as a lever to open discussions around how agricultural livelihoods are impacted by tobacco growing in a region where this option is benignly accepted as a viable approach to poverty reduction. The complexities inherent in this study purpose are connected with the tensions between national policy valuing tobacco growing as an economic priority in Zambia and in Western province, and national obligations to fulfill Articles 17 and 18 of the WHO Framework Convention on Tobacco Control as well as imperatives of the Sustainable Development Goals (see Chapter 2) (Goma et al., 2017; Kulik et al., 2017).

The interaction between poverty and tobacco growing has been studied but the interaction between food insecurity and tobacco growing has been less well researched, particularly in Western province. In rural, agricultural communities, household food insecurity is associated with insufficient local (or own) food production and/or income to procure food from local markets.

Since the local production of crops is impacted by local, regional, and international trade, and given evidence of food insecurity and malnutrition in the province, a study of the extent to which tobacco growing is implicated in challenges with access to food is warranted. Furthermore, women commonly bear responsibility for ensuring household access to food so, it is crucial to explore the experiences of women. Therefore, an important assumption of this study is that it is possible and desirable to estimate the prevalence of food insecurity in this tobacco growing region and to recognize that this challenge affects stakeholders in different ways. In other words, to enrich our understanding of the challenge, it is desirable to provide some quantitative estimation of any problem with food insecurity especially as associated with tobacco growing, and to describe the lived experiences of people (men and women) affected by tobacco growing.

For the foregoing reason, a pragmatic approach was applied with the assumption that there are both observable dimensions that may be studied by quantitative approaches and the use of standardized assessment tools. Becoming immersed in the lived experiences of affected people through active engagement with interview data and observations also facilitated the researcher's access to less quantifiable dimensions of the social processes at play. The pragmatic lens recognizes that it is possible to interact with social phenomena by being abductive, that is iteratively moving between deduction and induction. Furthermore, it is logical to mix research approaches in ways that offer the best opportunities for answering the question(s) (Johnson & Onwuegbuzie, 2004; Maxcy, 2003).

3.3.2 Study design, data collection and analysis methods

To reiterate, the key questions of the study are:

(i) What is the extent (prevalence) of food insecurity in this tobacco growing region, what are associated determinants and what association is there with tobacco growing?

(ii) Why would tobacco growing households become food insecure?

(iii) What are the gendered consequences of tobacco growing as they relate to household food access, and what does this mean for gender-transformative sustainable alternatives to tobacco farming?

In this mixed methods study, quantitative methods were necessary to identify probable associations between food insecurity and tobacco growing as the main household livelihood strategy (RQ sub-1) whereas qualitative methods were important to uncover information about experiences with food access in tobacco and non-tobacco farming households (RQ sub-2). Methods used included a survey (RQ sub-1), in depth interviews with women and men, focus group discussions with women and men, key informant interviews (RQ sub-2 and RQ sub-3). Additional information was collected through document review and non-participant observation. Study participants were sampled using both probability and purposive procedures appropriate to mixed methods research to achieve both representativeness and depth (Teddlie & Yu, 2007).

In the quantitative strand of the study, a survey questionnaire was developed to assess variables on agricultural livelihood and food security (access). The survey questionnaire collected demographic information and incorporated the Household Food Insecurity Access Scale, HFIAS (Coates et al., 2007) for assessing food security. The questionnaire was field tested to ensure that locally understood words and phrases were used for all questions asked, and in particular for Part D of the questionnaire where the HFIAS was incorporated. The qualitative strand explored experiences with household food access and other concerns with tobacco growing through focus groups discussions with different women and men groups, and in-depth interviews with key individuals with varied degrees of involvement in agricultural livelihoods and community life. Interviews were conducted until saturation was reached (Morse, 2015).

Quantitative and qualitative data sets were analysed separately. Quantitative data were recorded in Excel for data cleaning and then exported to SPSS for descriptive statistics and regression analysis; qualitative data were organized in NVivo then analyzed applying thematic analysis strategies to describe patterns and meanings (Braun & Victoria, 2006; Clarke & Braun, 2017). Findings from each strand were compared to identify and interpret any convergence or dissonance between reported personal experiences and measures of association with household food insecurity and tobacco growing.

Further details of these methods are provided in relevant findings chapters: quantitative methods (see chapter 3), qualitative methods (see chapters 4 and 5).

3.4 Methodological limitations

This study exemplified some of the limitations that have been recognized with mixed methods research. Typically, studies based on MMR designs require more time and resources for execution responsive to the iterative process of data collection and analysis across research phases (Caruth, 2013; Teddlie & Yu, 2007). In planning, this was taken into account however, financial, time and contextual constraints affected the extensive collection of both types of data, causing trade-offs to be made (Teddlie & Yu, 2007).

The COVID-19 pandemic declared in the first quarter of 2020 constituted an unanticipated contextual constraint. There were delays in commencing the study, new restrictions on research with human participants in the context of a pandemic as well as constraints to travel to the study setting. Although the delays occasioned by the pandemic were unavoidable, some funding for the research was lost. Lost research funding was mitigated by re-allocating some funds ear-marked for researcher travel expenses to expand the local research team.

In general, primary qualitative and quantitative data collection is enhanced when the researcher is present on-site but pandemic-related travel restrictions gave rise to opportunities to pivot to remote data collection strategies. Prior to the declaration of the pandemic, a scoping visit in 2019 helped the researcher form connections with local stakeholders and research assistants, who in turn helped to shape questionnaire design and pre-testing of the questionnaire. Observations made during that scoping visit also filled some of the need for non-participant observation that supports in-person data collection. The researcher worked with a team of local research collaborators (RCs) to train field assistants in administering the questionnaire after securing informed consent from participants; research collaborators also facilitated focus group discussions (FGDs) drawing on their prior experience with FGDs. Finally, RCs scheduled Zoom interviews with identified key informants, and facilitated participants' access to Zoom. The researcher conducted all in-depth interviews with key informants independently.

In addition, it is recommended for single researchers executing MMR studies to have a high degree of methodological fluency in both quantitative and qualitative research approaches as this will facilitate the appropriate selection and utilization of tools for data collection and analysis (Fox & Alldred, 2018; Sykes et al., 2018). Consulting widely with colleagues with strengths in quantitative research supported the researcher's utilization of quantitative approaches, while integrating her own strengths and training in qualitative research methods. Given the researcher's bias towards qualitative research, this MMR study is qualitative dominant.

Given the need to switch between two complementary research approaches, it is more efficient for MMR studies to be conducted by a team of researchers comprising persons that have expertise in either quantitative and qualitative research approaches. Members of the team complement each other while precluding challenges associated with single researchers switching

between approaches in a single study. This will result in efficiencies in the data collection, analysis and reporting aspects of the research process.

3.5 Conclusion

The research process encompasses research design, questions formulation, methods selection for primary and/or secondary data collection, analysis, and presentation of research findings. Decisions about the entire research process are influenced by a researcher's assumptions about the nature of people's reality and how we access knowledge about it. Traditionally, quantitative and qualitative research approaches use specific paradigmatic lenses stemming from different views about the nature of social phenomena. Both approaches are limited by focusing on a single perspective and while this is appropriate for some questions, it is not for questions that explore complex phenomena. Mixed methods research has come to be accepted as a third methodological approach that allows researchers to answer questions about social phenomena in ways that are responsive to contextual uniqueness while providing generalizable estimations.

This chapter has explained why a mixed method approach was adopted for this study. Interrogating food insecurity in the context of tobacco growing requires an approach that both estimates the prevalence of food insecurity in the study setting and describes the experiences of stakeholders, particularly women. Aspects of this study examine complex social issues like the interactions between international trade and local agricultural production systems as well as gender roles and relations.

In this study, a pragmatic lens was applied to determine the best techniques for answering the research questions posed. A cross sectional survey was administered concurrently with, but separate from, focus group discussions with different women and men groups as well as in-depth interviews with key informants. Quantitative and qualitative data sets were analysed separately but

integrated to answer research questions two and three; question one on the prevalence and demographic correlates of food insecurity was answered using the quantitative approach only.

Despite constraints posed by the pandemic, mixed methods research has proved useful to answer the research questions where findings indicated by the quantitative strand of the study differed from findings indicated by the qualitative strand. This dissonance would not be adequately addressed otherwise.

Chapter 4

Predictors of food insecurity in a tobacco-growing region of Western Zambia

An important goal of the 2030 Agenda for Sustainable Development is to eliminate hunger and ensure year-round access to food. Despite this, the prevalence of food insecurity rose in the years since the Agenda was adopted in 2015. The overall production of food may be sufficient to meet world food needs but the right to food security is unfulfilled for billions of people globally (FAO, IFAD, UNICEF, 2021; Smith et al., 2017). As a dimension of food insecurity, the prevalence of undernourishment in the world rose from 8.3% in 2015 to 9.9% in 2020 (FAO, IFAD, UNICEF, 2021). Sub-Saharan Africa is one of the regions with the steepest increases in food insecurity, with a change from 19.4% to 24.1% - and 799 million people who experienced moderate to severe food insecurity in 2020 (FAO, IFAD, UNICEF, 2021). The United Nations Food and Agriculture Organization warns of the need for urgent attention to prevent missing the Sustainable Development Goal (SDG) of eradicating hunger (UN Goal 2).

Food insecurity has significant repercussions for mortality, morbidity, and disability rates in any country. Children and women of reproductive age are particularly susceptible as malnourished women are more likely to experience birth complications and give birth to low birth-weight children who could die during infancy (Coburn et al., 2015). Stunting is common in undernourished infants who survive childhood, crippling them and shortening their lives. Due to their physiology and high calorie requirements for growth and development, children are particularly susceptible to the effects of food insecurity and malnutrition. Malnutrition is an underlying cause of mortality for about 3.5 million children in sub-Saharan Africa each year (Drammeh et al., 2019).

4.1 Background

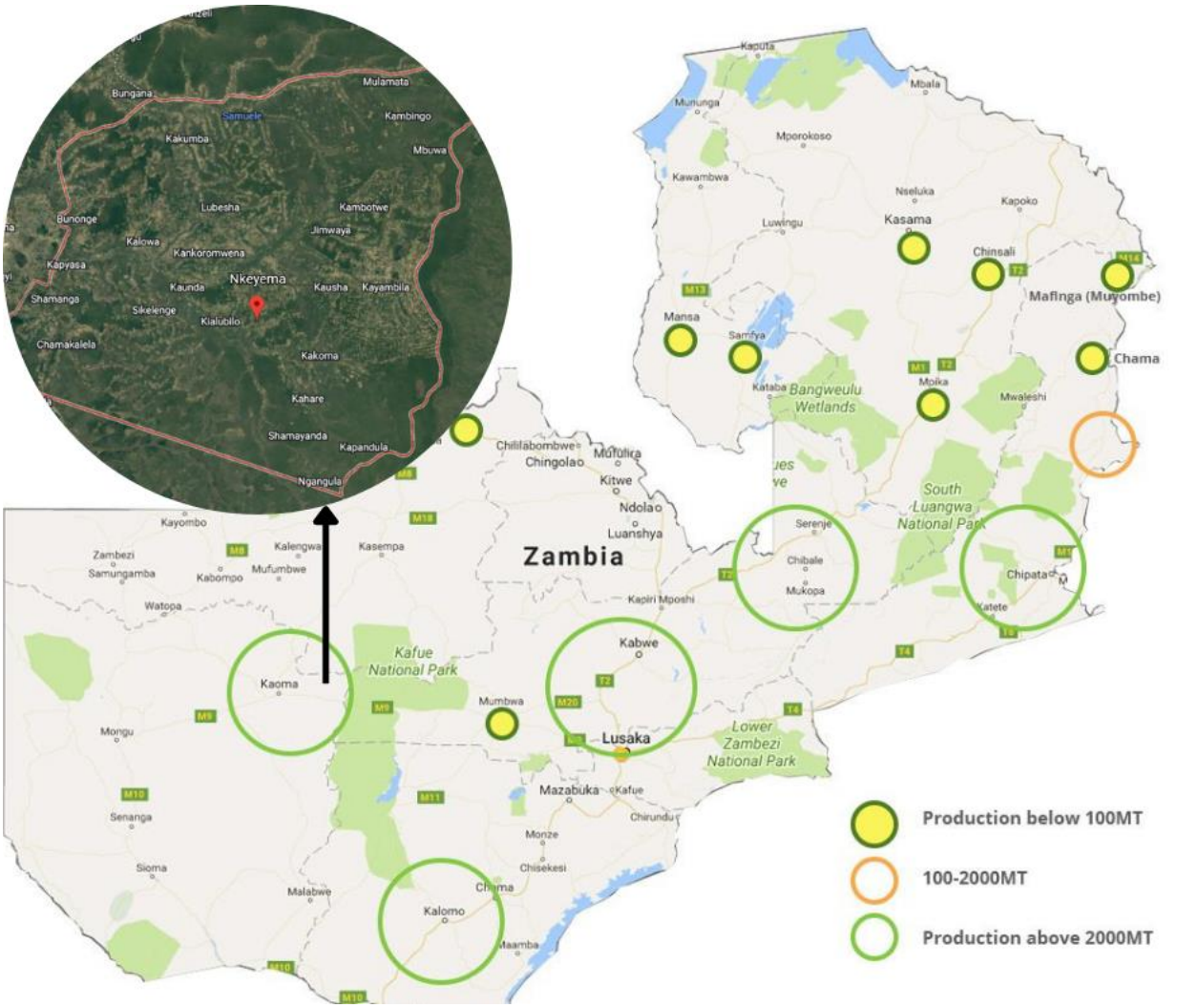
Food insecurity is characterized by three distinct experiences (1) uncertainty about future food availability and access, (2) inadequacy in the quantity and kind of food needed for a healthy lifestyle, or (3) the necessity to get food via socially undesirable methods (Arcury et al., 2001; Hamelin et al., 2002; Quandt et al., 2000; Radimer et al., 1992; Wolfe et al., 2003). Poverty is globally recognized as a primary driver of food insecurity and food insecure people generally share other characteristics including being unemployed and having low levels of education (Smith et al., 2017). However, many other drivers of food insecurity are shaped by context including factors like climate variability, susceptibility to drought, unsustainable agricultural practices in land use and resource allocation, as well as individual factors like household size and type of livelihood, including access to livelihood assets (UNICEF, 2017). These agriculture related factors are important for many countries in sub-Saharan Africa, agriculture is the largest primary employer in rural areas.

At present, agriculture contributes about three percent of the gross domestic product of the Republic of Zambia (O'Neill. A.O, 2022). Western province, where the Lozi people are the major ethnic group, is one of the country's ten administrative provinces. Over 80 percent of the province is rural, so agriculture is the predominant occupation with farmers engaged in subsistence-level cultivation of food crops like maize, rice, potatoes, cassava, and millet and raising livestock. Western Province remains among the poorest in the country and chronic undernutrition is a challenge. Extreme poverty is noted in about 73% of the 1.02 million residents and 75% of children are born into households with multidimensional poverty – simultaneously experiencing low incomes, low educational attainment compared to national averages, low access to clean water and electricity as well as hunger and malnutrition (CSO, 2016, 2018; UNICEF, 2017). The effects of chronic undernutrition – itself an indicator of food insecurity – are evident in the prevalence of

stunting, which affects about 29% of children under-five years of age (Psaki et al., 2012; Zambia DHS 2018).

Figure 3

Map of Zambia showing tobacco growing areas and study area



Source: Tobacco Board of Zambia (map showing tobacco areas), Google Earth (Nkeyema area)

Note: Older maps like this one by the Tobacco Board of Zambia do not show Nkeyema district.

Farmers in Western Province mostly grow maize, the national staple food crop but, due to the soils being generally sandy soils, crop yields are sub-optimal. These soils are known to be good for growing cashew nuts so, significant investment has been directed to developing cashew nut value chains in Western province with less than optimal results (AFDB, 2020; Nyirenda et al., 2021). In the most arable region of the province, tobacco is also grown. Tobacco growing in Western province is concentrated in Nkeyema, and to some extent, Kaoma from which Nkeyema was carved out in 2012. Out of the province's 16 districts, Nkeyema and Kaoma are anecdotally described as the 'food basket' of the province. Nkeyema district (also commonly called TBZ village because the Western province office of the Tobacco Board of Zambia (TBZ) is located here) borders the Kafue National Park – the oldest and largest of the country's national parks. Nkeyema's proximity to the park means it is rich in the timber resources needed for curing tobacco.

Supported by the influence of multinational tobacco companies and national tobacco leaf buying companies in Zambia, tobacco growing has been promoted as the most economically profitable farming activity. Many studies across multiple low- and lower middle income countries have refuted this claim of profitability especially among smallholder farmers showing instead that tobacco growers operate at net loss after all input costs are accounted for (Kibwage et al., 2009; Makoka et al., 2017; Makoka, Appau, et al., 2016; Otañez et al., 2009; Van Minh et al., 2009). Studies have also documented environmental consequences of tobacco farming such as deforestation and soil degradation (Akhter et al., 2014; Lecours et al., 2012; Mwita, 2012). Deforestation has consequences for rainfall patterns, and this will intersect with degraded soil quality to negatively impact agricultural productivity. While poverty and environmental degradation are identified among determinants of food insecurity, the nature of the agricultural enterprise must also be considered – this refers to the actual processes and activities influencing farming practice and choice of crops grown.

In Western province, it is important to interrogate how tobacco growing as an agricultural enterprise has contributed to shaping food insecurity. Some research has alluded to this intersection (Akhter et al., 2014), however, the connection between investing in tobacco growing and falling short of meeting Sustainable Development Goal 2 to eliminate hunger has been poorly described in the sub-Saharan Africa context. As a result, there is a pressing need to expand documentation of the socioeconomic issues associated with tobacco farming and food insecurity in Western province, and to offer recommendations that address the issue of food insecurity in the province, and across Zambia and sub-Saharan Africa more broadly.

Therefore, this study aims to (1) estimate the prevalence of food insecurity in the tobacco farming region of Nkeyema and its neighbouring district Kaoma, and (2) examine and describe the predictors of food insecurity in this tobacco farming region. The findings of this study will contribute to better understanding of the factors associated with food insecurity in Zambia. Hunger reduction calls for an integrated approach including public and private investments in agriculture development so the findings of this study will also strengthen evidence in support of advocacy to develop alternative livelihoods to tobacco farming in Sub-Saharan Africa.

4.2 Methods

4.2.1 Description of study area

Nkeyema agricultural block was delineated as the primary setting – it is comprised of contiguous communities in the districts of Nkeyema and Kaoma, Western Province, Zambia where tobacco growing occurs. Communities in the block have externally homogenous population characteristics. Nkeyema and Kaoma are also the source of a significant volume of agricultural produce in the province. The Tobacco Board of Zambia (TBZ) has its provincial headquarters in Nkeyema from where it registers tobacco growers and provides some regulatory oversight for tobacco growing

activities in Nkeyema and Kaoma districts. TBZ works with several tobacco leaf buying companies including Japan Tobacco International (JTI), Tombwe Processing Limited and Alliance One. Only JTI has an operational office in Nkeyema and like other leaf buying companies, JTI contracts with smallholder tobacco farmers in the Nkeyema and Kaoma districts to grow flue-cured Virginia tobacco leaf (JTI, 2021).

4.2.2 Study design and sampling

A cross-sectional survey was conducted with two different sample populations: the first sample was comprised of farming households selected from the Nkeyema agricultural block between September and October 2020 (Sample 1) while the second sample targeted tobacco growing households only from the same block between September and October 2021 (Sample 2). These sample populations were treated as different but complementary data sources to estimate the prevalence and predictors of food insecurity in the general population and among tobacco growers.

To administer extension services, the Nkeyema agricultural block is divided into forty zones, hence a two-stage cluster sampling approach was used to recruit Sample 1 households into the study. In the first stage, eight zones (representing 20% of existing zones in the agricultural block) were randomly selected as clusters. In the second stage, 48 households were selected by simple random sampling using a random number generator. The random number generator was applied to household lists generated by agriculture extension officers in collaboration with community leaders. The Raosoft Sample Size calculator (Raosoft Inc., 2004) was used to calculate the estimated total sample size, yielding a target sample of 384 households. An additional 10 households were included to account for household attrition, so data were collected from 394 households in the first sample. To collect recruit households for Sample 2, the same clusters were

used as before however, a snowball sampling strategy was applied to select only households that grew tobacco.

For both samples, the inclusion criteria were: (i) man or woman aged 18 years and older (ii) resident in Nkeyema or Kaoma (iii) voluntarily consented to participate, and (iv) for Sample 2, households grew tobacco. The last criterion was important because only 43 respondents from Sample 1 reported that they grew tobacco, limiting the generalizability of inferences from that dataset.

Formal approval for the ethical conduct of this study was provided by the Office of Research Ethics at the University of Waterloo, Canada (ORE# 41455) and the Biomedical Research Ethics Committee of the University of Zambia (#708-2020).

4.2.3 Procedure

Questionnaires with closed-ended questions and pre-defined responses were administered to selected households. Data were collected by field research assistants (FRA) with prior experience in supporting community-based participatory research. They were identified and recruited with help from a local research partner, the Centre for Primary Care Research (CPCR) at the University of Zambia (UNZA). The FRAs were undergraduate students, agricultural extension officers, primary school teachers and local health officers in Western Province and were trained in the administration of the survey questionnaire for two days prior to data collection. The training included procedures to ensure data integrity and validity, securing informed consent and ensuring confidential handling of participant personal data.

During the training, a convenience sample was used to pre-test the questionnaire. This sample was comprised of ten participants from an identical village population not included in this research. The pre-test provided feedback on the format of questions, structural patterns, assessment

of the length of the questionnaire, and the identification of any issues with comprehension or interpretation. Following the pre-test, identified issues were addressed to ensure clarity, appropriateness, proper sequencing of questions and response to skip patterns, as well as contextual relevance and sensitivity.

This process also enabled the field team to review the questionnaire for clarity and for harmonizing the translation of certain words into the local language as needed. However, the questionnaire was administered in English insofar as the language is widely understood and spoken in the study area, and the same team of research assistants administered the survey questionnaire in both cycles of data collection (2020 and 2021).

4.2.4 Measures

The survey instrument consisted of five parts: Part A featured questions about the farmers' demographic characteristics including sex of household heads, age, marital status, highest level of education attained, and occupation; Part B focused on household farm characteristics such as the type of crops grown, farm sizes, allocation of land to tobacco and/or food crop farming, the quantity of land unutilized, and income from farming activity; Part C examined access to and roles regarding household food access as well as how long food lasted in the household; Part D assessed household food insecurity while Part E assessed the general health of the household (See Appendix for a copy of the survey questionnaire).

The Household Food Insecurity Access Scale (HFIAS), which has been validated for cross-cultural utilization in the assessment of both severity and prevalence of food insecurity (Desiere et al., 2015; Knueppel et al., 2010) was adopted for Part D. A HFIAS score variable was calculated for each household by summing the codes for each frequency-of-occurrence question. The scores range from 0-27. The lower the score (0-27), the less food insecurity (access) a household

experienced. Furthermore, HFIAS assesses three main indicators related to food insecurity (i) worry/anxiety about food (ii) insufficient quality and, (iii) insufficient food intake and its consequences (Coates et al, 2007).

4.2.5 Data analysis

After screening, observations that did not meet the inclusion criteria (that is, the respondent was below 18 years of age) were eliminated. Data analysis was conducted using 391 observations in Sample 1, and 116 in Sample 2 (only tobacco growers). The unit of analysis in both samples was the household so respondents provided information on socio-demographic variables for the household head. Descriptive and inferential analyses were done using SPSS version 28. Frequencies, proportions and other relevant summary statistics were calculated for sociodemographic variables (i.e., sex, age, marital status, education, number of people in household, number of under-five children in household, and occupation) and other variables relevant for establishing household access to agricultural land and pathways for accessing food (i.e., land ownership, land size, crops grown, tobacco growing status, number of years grown tobacco, net income, main source of food eaten in household, percent of farm used for food crops and tobacco growing, and how long staple foods last).

The prevalence of food insecurity was expressed as proportions of the study population. Further, a Household Food Insecurity (Access) score ranging from 0-27 was assigned to each household based on responses to a past 30-day recall. The score is directly proportional to the severity of food insecurity, where food secure households score zero and higher numbers on the scale indicate the severity of food insecurity experienced by a household. Thereafter, the average Household Food Insecurity (Access) Score was estimated for each sample as a summary

representation of how much each household in the sample from each cycle experiences food insecurity.

Linear regression analysis was used to assess the association between socio-demographic and farmer characteristics (independent variables) and food insecurity (using the continuous Household Food Insecurity (Access) – HFIA – scale score as the dependent variable). Bivariate linear regressions were done to assess the relationship between each of the independent variables and the HFIA scale score. A multivariable linear regression model was then constructed using variables that had significant associations with food insecurity at $p < 0.05$, to estimate the most likely predictors of food insecurity in either sample. Demographic variables were included in the model as control variables.

4.3 Results

4.3.1 Characteristics of participants

Tables 1 – 3 summarize socio-demographic and farmer characteristics of households in both rounds (Sample 1, n=391 and Sample 2, n=116).

In Sample 1, about two-thirds of participants were married and from a household that had a male household head. In addition, the mean age of participants was 46 years old (standard deviation, SD 16.9). Households had an average of 6 members – defined as members that share meals from the same pot. Whereas 54.7% of participants had some secondary school education, 29.2% had completed only primary school. Seventy-six percent of participants reported that they were farmers.

Ninety percent of households farmed on lands without statutory title deeds[3] and farm sizes were an average of five and half hectares (Mean 5.5 ha, SD 7.7). Households that left more than three-quarters of their land uncultivated comprised 35% of the sample. Most households reported that they mainly grew food crops and only 43 households in this sample also grew tobacco and had done so for an average of 4.07 (SD 4.06) years. The average amount of land that tobacco growers in this sample allocated to tobacco was 1.1 (SD 1.19) hectares. Participants also reported that they planted food crops on lands averaging 1.3 hectares in size (SD 2.27). Maize was the predominant staple food crop grown and eaten in households. About 70 percent of households sourced their staple food from household farms. Household staple food stores were sufficient for a mean duration of 4.26 (SD 3.21) months but about one in every five households had food stores that lasted more than 6 months. Study participants also reported that they spent an average of 500 (SD 419.6) Kwacha on food in the previous month – this translates to approximately US$30.[4] The observations on net income (less costs at end of their farming season) were significantly skewed, but in Sample 1, the median net income was 1,200 Kwacha (US$72).

In the sample of tobacco growers only (Sample 2, n=116), almost three-quarters of households had male household heads. In this sample, the mean age of household heads was 43 years old, and 73 percent were married. Households had an average of eight residents. Less than half (45.7%) of participants had some secondary education. In this tobacco grower only sample, 75 percent were contracted to tobacco companies and had access to more land (mean 25.2 hectares, SD 35.0) than farmers in the first sample (i.e., mean 5.5 hectares, SD 7.7). Regardless of land size,

[3] In the study area, farmers have several pathways to access land for farming or other purposes. They may purchase land from the government and receive a statutory certificate of ownership/occupancy. More commonly, they apply to the council of chiefs, who are the custodians of all lands not under the control of the government. Chiefs will allocate land for farming to applicants for a modest fee and issue a customary title of occupancy. Such lands may not be sold or transferred to new owners without consent from the chiefs. Many farmers farm on lands that have been customarily held in the family without need to apply for title deeds.

[4] Conversion rate on 31st December 2021 was ZMW 1 (Kwacha) = 0.06 USD, xe.com

58.6% of households left more than three-quarters of their land uncultivated. The data in Table 2 shows that even though farmers in this sample had more land, the amount of land they allocated to growing tobacco was slightly less (i.e., mean 0.96 hectares, SD 0.7) than amounts allocated to tobacco growing by farmers in the first sample. They also allocated more land to growing food crops (mean 2.18 hectares, SD 1.82). These tobacco growers had grown tobacco for a mean duration of 7 (SD 5.88) years, an average of three years longer than tobacco growers in Sample 1.

Table 1

Sociodemographic characteristics of study participants in Sample 1 (n=391) and Sample 2 (n=116)

	Sample 1 % (n)	**Sample 2 % (n)**
Sex of household head		
Male	66.8 (261)	74.1 (86)
Female	33.2 (130)	25.9 (30)
Sex of respondent		
Male	44.2 (173)	62.1 (72)
Female	55.8 (218)	37.9 (44)
Age		
18 – 39 yrs	38.1 (149)	44.0 (51)
40 – 59 yrs	39.1 (153)	44.8 (52)
60 yrs & above	22.8 (89)	11.2 (13)
Mean (SD)	46.0 (16.9)	43.3 (12.6)
Marital status		
Single (never married, widowed, divorced, separated)	37.9 (148)	26.7 (31)
Married	62.1 (243)	73.3 (85)
Number of residents in the household		
1 – 4 members	26.3 (103)	15.5 (18)
5 – 8 members	52.9 (207)	62.9 (73)
9 & above	20.7 (81)	21.6 (25)
Mean number of household residents (SD)	**6.4 (3.0)**	**7.7 (3.7)**
Number of children under 5 years in household		
Less than 3	80.6 (315)	71.6 (83)
3 & above	19.4 (76)	28.4 (33)
Highest level of education attained		
None	12.5 (49)	-

Sociodemographic characteristics of study participants in Sample 1 (n=391) and Sample 2 (n=116)

	Sample 1 % (n)	Sample 2 % (n)
Primary (Grade 1 – 7)	29.2 (114)	44.8 (52)
Secondary (Grade 8 – 12)	54.7 (214)	45.7 (53)
Tertiary (College/University)	3.6 (14)	9.5 (11)
Occupation		
Unemployed	2.8 (11)	-
Farmer	76.0 (297)	95.7 (111)
Trader	6.9 (27)	-
Others (hunting, civil service, skilled trades, etc.)	14.3 (56)	4.3 (5)

Table 2

Farmer characteristics in Sample 1 (n=391) and Sample 2 (n=116)

	Sample 1 % (n)	Sample 2 % (n)
Own land with title deed		
Yes	9.2 (36)	96.6 (112)
No	90.5 (354)	3.4 (4)
Size of the land they had: Mean farm size (SD)	5.5 (7.7)	25.24 (34.97)
Tobacco grower type		
Contract	10.5 (41)	75.0 (87)
Independent	-	25.0 (29)
Proportion of uncultivated farmland		
0 – 25%	23.7 (92)	5.2 (6)
26 – 50%	17.7 (69)	6.9 (8)
51 – 75%	23.7 (92)	29.3 (34)
Above 75%	35.0 (136)	58.6 (68)
Crops grown		
Food crops only	89.0 (347)	-
Tobacco, and food crops	11.0 (43)	100 (116)
How many years grown tobacco		
Less than 5 years	73.2 (30)	49.1 (52)
5 years and above	26.8 (11)	50.9 (54)
Mean number of years growing tobacco (SD)	4.07 (4.06)	7.05 (5.88)
Land size under tobacco growing		
Mean (SD)	1.11 (1.19)	0.97 (0.71)
Median	0.8	0.8
Land size under food crops		
Mean (SD)	1.34 (2.27)	2.18 (1.82)
Median	0.8	1.5

Farmer characteristics in Sample 1 (n=391) and Sample 2 (n=116)

	Sample 1 % (n)	Sample 2 % (n)
Staple food eaten in household		
Maize	97.4 (381)	99.1 (115)
Other (Cassava, Rice)	1.8 (7)	-
Source of staple food		
Own farm	69.3 (271)	95.7 (111)
Buy from market	16.6 (65)	0.9 (1)
Others (charity, food aid, forests)	14.1 (55)	3.4 (4)
How long staple food lasts, months		
≤ 3 months	53.7 (210)	0.9 (1)
4-6 months	24.6 (96)	8.6 (10)
Above 6 months	21.7 (85)	90.5 (105)
Mean, months, (SD)	**4.26 (3.21)**	**9.95 (2.61)**
Amount spent on food, ZMW (Kwacha)		
Mean (SD)	500.62 (419.56)	11,217.76 (8,871.34)
Median	400	9,000
Net income, ZMW, Median (IQR)	1,200 (4,150)	20,000 (32,800)
Below median	30.9 (121)	46.6 (54)
Median and above	32.0 (125)	52.6 (61)
Not stated	37.1 (145)	0.9 (1)

Ninety-six percent of households in Sample 2 sourced their staple food (maize) mainly from their own farms and household staple food stores were sufficient for a mean duration of ten months, which was longer than the four months that food stores lasted for the farmers in the first sample. Additionally, study participants in this sample spent more money on food in the previous month – an average of 11,217 (SD 8,871) Kwacha – this was approximately US$673. Net incomes reported in Sample 2 were much higher (median ZMW 20,000, US$1,200), compared with those from Sample 1 with median net incomes of 1,200 Kwacha (US$72).

4.3.2 Prevalence of food insecurity in Kaoma and Nkeyema

The mean Household Food Insecurity (Access) scale score for Sample 1 was 7.2 (SD 7.9), representing a moderate prevalence of food insecurity in this sample when the proportion of food

secure households is considered. However, 47.6% of households in this sample experienced severe food insecurity. Corresponding to this, more than 45% of households experienced any of or all three domains of food insecurity: anxiety, eating food of insufficient quality and experiencing insufficient food intake (see Table 3).

In the tobacco growing sample (Sample 2), the mean Household Food Insecurity (Access) scale score was 1.4, indicative of mild food insecurity as the score suggested that there was some worry and anxiety over food access, or occasionally eating food of insufficient quality or quantity. A lower proportion of households from this sample were severely food insecure (9.5%) compared to those households from the first sample.

Table 3

Prevalence of food insecurity in the study area

	Sample 1 % (n)	**Sample 2 % (n)**
Food secure	44.8 (175)	80.2 (93)
Mild food insecurity	6.6 (26)	6.9 (8)
Moderate food insecurity	1.0 (4)	3.4 (4)
Severe food insecurity	47.6 (186)	9.5 (11)
Average household food insecurity (access) score (SD)	**7.2 (7.9)**	**1.4 (0.3)**
Proportion of households experiencing any of the three domains of food insecurity		
Anxiety and uncertainty about the household food supply	49.1%	16.1%
Insufficient quality (includes variety and preferences of the type of food)	48.7 %	52.5%
Insufficient food intake and its physical consequences	46.4 %	33.1%

4.3.3 Factors associated with household food insecurity

Table 4 presents the results of bivariate linear regression analysis to indicate factors associated with food insecurity in Sample Round 1 and the tobacco growers' sample (Sample Round 2). At p value < 0.05, factors that were associated with food insecurity in Sample 1 were: the sex of the

household head, marital status, age, the source of the household staple food, duration that food stores last each year (number of months), the proportion of farmland used for food crops, and the proportion of farmland that was not cultivated.

The factors that were significantly associated with food insecurity in the tobacco growing sample (Sample 2) were age, years that the farmers had been growing tobacco, and the duration that household food stores lasted.

Table 5 shows the predictors of food insecurity from the multivariable linear regression analysis. Holding all other variables constant, at $p < 0.05$, the predictors of significant positive or negative changes in the Household Food Insecurity Access (HFIA) score in Sample 1 were being married versus being unmarried [i.e., single, widowed, divorced or separated] (B= -2.175, 95% CI -4.082 to -0.267; p=0.026), age (B=0.099, 95% CI 0.055 to 0.142; p=<0.001), number of children under five in the household (B=0.575, 95% CI 0.048 to 1.103; p=0.033), tertiary education versus none/primary education highest level of education attained (B= -4.060, 95% CI -7.978 to -0.142; p=0.042) and the proportion of farmland that was left uncultivated (B=0.121, 95% CI 0.045 to 0.198; p=0.002).

In Sample 2, predictors that had a significant association with the HFIA score were age (B=0.060, 95% CI 0.012 to 0.108; p=0.015), and the duration that household staple food stores lasted (B=-0.477, 95% CI -0.717 to -0.237; p=<0.001).

Table 4

Factors associated with food insecurity in Sample 1 and Sample 2 (Bivariate linear regression analysis)

	Set 1, n=391				**Set 2, N=116**			
	Unstandardized B coefficient	***p* value**	**95% CI**		**Unstandardized B coefficient**	***p* value**	**95% CI**	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound
Sex of respondent								
Female	Ref				Ref			
Male	-1.577	0.051	-3.159	0.005	-0.308	0.648	-1.640	1.024
Sex of household head								
Female	Ref				Ref			
Male	**-2.736**	**0.001**	**-4.389**	**-1.082**	-0.599	0.422	-2.072	0.874
Marital status								
Unmarried (Single/Widowed/Divorced/Separated)	Ref				Ref			
Married	**-2.786**	**<.001**	**-4.390**	**-1.182**	-.084	0.910	-1.546	1.378
Age	**0.116**	**<.001**	**0.071**	**0.161**	**0.070**	**0.006**	**0.021**	**0.120**
Number of children under five years in household	0.441	0.126	-0.124	1.005	-0.051	0.795	-0.441	0.338
Highest level of education								
None/Primary (Grade 1 – 7)	Ref				Ref			
Secondary (Grade 8 – 12)	-0.414	0.616	-2.034	1.206	-1.172	0.087	-2.515	0.171
Tertiary (College/University)	-3.379	0.127	-7.719	0.962	-1.661	0.152	-3.944	0.623
Occupation								
Unemployed/ Other (trader/hunter/civil servant/)	Ref				Ref			
Farmer	-1.774	0.059	-3.613	0.065	-	-	-	-
Own land with title								
No	Ref				Ref			
Yes	0.339	0.807	-2.393	3.071	-	-	-	-

	Set 1, n=391				Set 2, N=116			
	Unstandardized B coefficient	***p* value**	**95% CI** Lower Bound	Upper Bound	**Unstandardized B coefficient**	***p* value**	**95% CI** Lower Bound	Upper Bound
Tobacco farmer								
No	Ref							
Yes	-2.233	0.081	-4.747	0.280	-		-	
Years grown tobacco	0.099	0.717	-0.450	0.647	**0.211**	**<.001**	**0.103**	**0.319**
Source of staple food								
Farm	Ref							
Buy from market	**4.657**	**<.001**	**2.570**	**6.743**	-		-	
Other (charity)	-2.005	0.103	-4.416	0.406				
Duration that food stores last	**-0.380**	**0.002**	**-0.622**	**-0.137**	**-0.461**	**<.001**	**-0.695**	**-0.228**
Proportion of land used for food crops	**-0.050**	**<.001**	**-0.072**	**-0.027**	-0.041	0.072	-0.085	0.004
Proportion of uncultivated land	**0.058**	**<.001**	**0.036**	**0.081**	0.028	0.077	-0.003	0.058

Table 5

Predictors of food insecurity – multivariable linear regression analysis

	Set 1, n=391				Set 2, N=116			
	Unstandardized B coefficient	***p* value**	**95% CI** Lower Bound	Upper Bound	**Unstandardized B coefficient**	***p* value**	**95% CI** Lower Bound	Upper Bound
Sex of respondent								
Female	Ref							
Male	-0.513	0.570	-2.287	1.262	-0.096	0.921	-2.003	1.810
Sex of household head								
Female	Ref							
Male	-0.453	0.681	-2.622	1.716	-2.262	0.072	-4.733	0.209
Marital status								
Unmarried (Single/Widowed/Divorced/Separated)	Ref				Ref			
Married	**-2.175**	**0.026**	**-4.082**	**-0.267**	1.973	0.063	-0.110	4.055

	Set 1, n=391				Set 2, N=116			
	Unstandardized B coefficient	***p* value**	**95% CI**		**Unstandardized B coefficient**	***p* value**	**95% CI**	
			Lower Bound	Upper Bound			Lower Bound	Upper Bound
Age	**0.099**	**<.001**	**0.055**	**0.142**	**0.060**	**0.015**	**0.012**	**0.108**
Number of children under five years in household	**0.575**	**0.033**	**0.048**	**1.103**	-0.179	0.352	-0.559	0.200
Highest level of education								
None/Primary (Grade 1 – 7)	Ref							
Secondary (Grade 8 – 12)	0.291	0.700	-1.195	1.777	-0.445	0.493	-1.729	0.838
Tertiary (College/University)	**-4.060**	**0.042**	**-7.978**	**-0.142**	-0.733	0.514	-2.955	1.488
Occupation								
Unemployed/ Other (trader/hunter/civil servant/)	Ref							
Farmer	-1.257	0.171	-3.060	0.545	-		-	
Source of staple food								
Farm	Ref							
Buy from market	2.192	0.056	-0.052	4.436	-		-	
Other (charity)	**-3.944**	**0.001**	**-6.341**	**-1.546**	-		-	
Duration food stores last	-0.200	0.107	-0.443	0.043	**-0.477**	**<.001**	**-0.717**	**-0.237**
Proportion of land used for food crops	0.064	0.100	-0.012	0.140	-0.109	0.064	-0.225	0.006
Proportion of uncultivated land	**0.121**	**0.002**	**0.045**	**0.198**	-0.041	0.305	-0.119	0.038

4.4 Discussion

According to the results, smallholder farmers in Nkeyema and Kaoma face moderate food insecurity. As a result, they do not always have access to food, eat lower-quality food, and have disruptions in their regular eating patterns. These have an impact on wellbeing, health, and nutrition.

The prevalence of food insecurity in Sample 1 (this sample corresponds with the general population in the study area) was estimated at 55%. This estimate was within the range of results found in other studies (Boero et al., 2021; Gebrie, 2021; Mango et al., 2018; Maziya et al., 2017; Sani & Kemaw, 2019; Silvestri et al., 2015) however diversity in the instruments used to estimate the prevalence of food insecurity across studies limits close comparison of these findings. The estimate among tobacco growers (Sample 2) could not be compared with previous studies that have addressed food insecurity among tobacco growers because these studies did not measure the prevalence of food insecurity using the HFIAS or similar instruments (Goma et al., 2017; Khisa, 2019). In the rest of this section, I first discuss significant findings and then discuss non-significant associations with food insecurity.

This study extends the findings of other studies (Dudek & Myszkowska-Ryciak, 2020; Maziya et al., 2017) that marital status predicts food insecurity (FI) i.e. being married to one or more partners was associated with a decrease in the HFIA score (B= -2.175, p=0.026) for farmers in Sample 1 whereas the relationship between marital status and HFIA score is not significant for Sample 2 (see Table 5). Maziya and colleagues (2017) asserted that married people may be less vulnerable to food insecurity because couples tend to play complementary roles in ensuring household food access but at the same time, married couples tend to belong to larger households that are more likely to be at risk of food insecurity (Endale et al., 2014; Omotesho et al., 2006).

Among tobacco growers in this study, most participants were married in households with up to eight members, and more people in the household means more food and non-food costs.

Increasing age was associated with an increase in the HFIA score in both samples (Sample 1: B=0.099, p=<.001 and Sample 2: B=0.060, p=0.015) and the mean age of participants from food-insecure households was greater than the mean age of participants from food-secure households. Increasing age could worsen food insecurity outcomes due to reduced energy levels and productivity as well as the likelihood of having greater family responsibilities (Mengistu et al., 2021; Mitiku et al., 2012; Sani & Kemaw, 2019).

Having children under the age of five in the household has implications for household food insecurity. In Sample 1, every additional child under five in the household was associated with an increase in the HFIA score (B=0.575, p=0.033). Farm productivity in low-and middle-income countries is affected by the availability of household labour, and women's labour in particular (Johnston et al., 2018). Mothers of children in the under-five age range have very demanding reproductive and care-giving responsibilities for these children in addition to other household tasks. These responsibilities cause them to be less available for farm work and take away from the stock of labour necessary for household farming activities– this means more mouths to feed while there are fewer hands working (Johnston et al., 2018; Sharafkhani et al., 2010).

Consistent with the findings of other studies (Mango et al., 2018; Smith et al., 2017), having tertiary education was associated with a decrease in the HFIA score (Sample 1: B= -4.060, p=0.042). Although this relationship was not statistically significant among households in Sample 2, the association was in the correct direction, i.e., a higher level of education was associated with a decrease in the food insecurity score (Sample 2: B= -0.733, p=0.514). Higher literacy levels enables farmers to better comprehend and use information that improves crop productivity, crop

and livelihood diversification, and household food access and nutrition practices (Amiresmaeili et al., 2021; Mango et al., 2018). This in turn may correlate with lower likelihood of experiencing any of the domains assessed by the household food insecurity access scale (HFIAS): anxiety, insufficient quality, and insufficient intake.

Interestingly, this study also shows an association between food access through strategies other than sourcing food from the family farm or local markets. Though most households in both samples accessed their staple food from family farms, for households in Sample 1, findings showed that getting the household staple food from sources described as 'other' – in this case, through support from charitable organizations – was associated with a decrease in the HFIA score (B= -3.944, p=0.001). One plausible explanation is that food and nutrition security interventions in the district[5] succeeded in reducing vulnerability to food insecurity among the very poor as was observed in Rwanda (Nsabuwera et al., 2015) but this finding should be investigated further because other studies have shown that food and nutrition interventions can fall short of reversing food insecurity in vulnerable populations (St-Germain et al., 2019).

An important assumption of this study was that household production of food crops should be protective against food insecurity by lowering barriers to household food access and the findings of this study appear to confirm this assumption. Arable farmland is an important production resource in rural agriculture and in this study, the proportion of uncultivated land was found to have a significant positive predictive relationship with the HFIA scale score among farmers in Sample 1 (B= 0.121, p=0.002). Previous studies have indicated similar findings without

[5] During the scoping visit that informed the design and planning of this study, it was mentioned that some non-governmental organizations had implemented food and nutrition interventions in the area but as it was not clear whether these were past or ongoing interventions, or if these were influenced by tobacco growing in the area, this study did not seek to explore what food and nutrition interventions were implemented nor determine their effectiveness.

explaining the probable association (Anderman et al., 2014; Rubhara et al., 2020). Farming is rain-fed and driven by manual labour in this area so, this finding suggests that smallholder farmers may be unable to mobilize the labour required to harness their agricultural land into crop production to a level that satisfies both household food and household income needs. Furthermore, it is probable that the volume of food crop production may be lower than optimal in view of the proportion of land that remain uncultivated for a significant percentage of participants in both samples assessed in this study. With access to the right mix of inputs and financing, farmers can convert land assets to household food supply that can sustain them even when cash supply is low (Fan & Rue, 2020).

In addition to land allocated to agricultural production, the ability to maintain food stores is significantly associated with as household food access has been found to be affected by the volume of staple crop that is retained for household consumption (Mubanga & Ferguson, 2017). For the tobacco growing sample in this study (Sample 2), the length of months that food stores lasted was a significant predictor of a change in the food insecurity access score i.e. a unit increase in the length of time that food stores lasted was associated with a decrease in the HFIAS scale score (B= -0.477, p<0.001). This finding indicates that factors that support households to grow and store enough food for year-round access are important enablers of rural food and nutrition security.

Non-significant associations were noted between the HFIA score and variables like the sex of household heads, ownership of land, and specific to this study, tobacco growing status. Some studies have reported significant associations between food insecurity and female household headship, related to low female autonomy, ownership of land or other assets, and lower access to education (Dodson et al., 2012; Mosa Selepe et al., 2015; Quisumbing & Pandolfelli, 2010). However, other studies also found a non-significant association between sex of the household head

and food insecurity, explaining that where there are fewer sociocultural limitations to women's labour participation, households headed by men are likely to have similar experiences with food insecurity as those headed by women (Mallick & Rafi, 2010).

In both samples, household farm size and land ownership status were not significantly associated with food insecurity. Where socio-demographic variables such as land ownership status are homogenous in a population, differences between groups are unlikely. In the study area, the traditional council of chiefs are the custodians of land, and all farmers accessed land from the council through customary leasehold arrangements in perpetuity. In the first sample, participants had access to five hectares of land on average whereas in the second sample, the average was 25 hectares. Given the relative homogeneity of land ownership within groups, it was not unexpected that land size was not associated with food insecurity.

Households in Sample 1 were more food insecure compared to those in Sample 2 (tobacco growers) (mean HFIAS scale score = 7.2 versus 1.4). Several factors may have contributed to this finding, for example tobacco growers (Sample 2) surveyed in this study generally had access to greater amounts of land, household labour and incomes (see Table 2) however, it may not be the case that tobacco growing resulted in these outcomes among these farmers. It is possible that the process of selection into tobacco growing favoured farmers who already had large amounts of land, access to labour, and access to financial resources that increased the likelihood that they would be successful as tobacco growers and have adequate access to food. Thus, the mechanisms by which tobacco growing may impact household food insecurity are not immediately obvious through survey data and other research methods are needed to interrogate further as was done in other studies (Goma et al., 2017; Khisa, 2019), and I extend their work using mixed data as discussed in the next two chapters.

4.5 Strengths and limitations of the study

This study contributes to expanding the limited literature on food insecurity in a tobacco farming region, building up understanding of the factors that contribute to creating or exacerbating food insecurity in this context. The assessment instrument, HFIAS, has been shown to have reasonable sensitivity for estimating the prevalence of 'access' component of food insecurity in low- and lower middle income countries (Jones et al., 2013b). In terms of general socio-demographic characteristics, the samples in this study are similar to sample populations in Ethiopia, Malawi, South Africa as well as Silvestri and colleagues multi-country study with sites in Kenya, Tanzania and Uganda (Gebrie, 2021; Mango et al., 2018; Maziya et al., 2017; Silvestri et al., 2015). Comparable variables include household size, education levels and smallholder farm sizes therefore this population is comparable to similar smallholder farming populations in sub-Saharan Africa.

The study has a few limitations. Food insecurity is a complex phenomenon, involving issues like accessibility and the stability of access, price, and food utilization. This study focused on the access dimension and dietary diversity is considered an important access dimension of food insecurity. However, cultural influences can affect the range of foods that may comprise a diverse diet in any given area (Pretorius et al., 2021) and it was not feasible to adapt an assessment approach that would account for this. An additional limitation is that the HFIAS relies on individual recall which may in turn be shaped by psychosocial shifts in interpretations of any of the nine questions comprising the instrument. Though the Food Insecurity Experience Scale (FIES) is a more recent globally comparable instrument that permits assessment of 57ccesss to food over 12 months (FAO, 2018a; Wambogo et al., 2018), during scoping consultations local stakeholders were of the opinion that the shorter recall timeframe of the HFIAS was more appropriate to their context.

Eligible participants were adults who were resident in the area up to one year and consented to participate. Given the widespread assumption that up to 80 percent of farmers in the area grow tobacco, it was assumed that the sampling strategy would include a significant number of tobacco growers. Therefore, efforts were made to systematically and randomly select households, but it is possible that those who elected to participate in this study did not identify as tobacco growers because the study area is composed of conservative, religious communities where tobacco use is frowned upon and there is widespread religious pressure on tobacco growers to abandon this livelihood (Sililo, personal communication, 2021). This may explain why tobacco growers constituted about eleven percent of participants in the first survey cycle. To better estimate the prevalence of food insecurity among tobacco growers, the same survey was implemented among tobacco growers only. This resulted in data that were instructive even though the population was not exactly comparable.

Notwithstanding these limitations, this study contributes to clarifying our understanding of how tobacco growing may or may not be implicated in a growing food insecurity crisis.

4.6 Conclusion

The overarching aim of this study was to estimate the prevalence and determinants of household food insecurity in a tobacco growing area within the borders of two districts in Zambia's Western province that are known to make significant contributions to food crop production in the province. For smallholder farmers in both samples of this study, increasing age is associated with experiencing food insecurity. Factors found in one sample or the other included having more than 3 children under the age of five, not having tertiary education, having uncultivated farmland, and the number of months that household food stores lasted post-harvest. Further research is needed to confirm causality with these predictors of food insecurity.

These findings indicate that programs targeting smallholder farmers in general will likely exclude the most vulnerable households. Vulnerable households are likely those that have a range of challenges with harnessing agricultural land into food production and thereafter, storing adequate quantities of food crop harvests for year-round access to food. These are likely to be households with older household heads, those that have several children under five years of age, have lower levels of education or are unable to cultivate up to fifty percent of available farmland. Taken together, these predictors may be thought of as factors that affect how physical assets are deployed to develop sustainable agricultural livelihoods.

The study also set out characterize food insecurity in an area where tobacco growing is a significant economic activity. Whereas the findings of this study did not indicate a significant association of food insecurity with tobacco growing status (i.e., whether a farmer grew tobacco or not), the relationship between food insecurity and tobacco is likely to be complex and multifaceted. Tobacco growing households can still become food insecure if they are unable to build food stores that are sufficient for year-round access to food. Households that choose to grow tobacco or similar non-food cash crops over food crops may rely on sourcing household food from markets (Anderman et al., 2014; Goma et al., 2017; Magati et al., 2016) but the relationship between income earned from cash crop production and household food access is non-linear.

Factors that influence how much food crops are grown will affect food (in)security. Maize is the predominant food crop grown in Kaoma and Nkeyema, and like in other parts of Zambia, farmers here grow maize predominantly for household consumption. There are indications that (i) the quantity of maize grown may be insufficient to meet household food needs or (ii) most of the maize output is sold for income rather than stored for the household (Mubanga & Ferguson, 2017). Agricultural policy should support farmers grow enough for both household and market demands.

To the extent that smallholder farming is organized to satisfy local and export market demands, the agriculture enterprise in rural Zambia resembles what is applicable in other low- and middle-income country contexts. Research has established that smallholder farmers produce much of the global food supply and in many sub-Saharan African countries (Bjornlund et al., 2020). Progress on eradicating hunger (SDG 2) means that governments and other stakeholders must treat food insecurity as a violation of human rights and that agricultural policy needs to adopt a food systems lens that supports the development of diverse food crop value chains that meet domestic food needs even as market or export concerns are addressed.

Chapter 5

‘Tobacco is a jealous crop’
Why households that grow tobacco become food insecure

A broad range of studies have assessed household food insecurity using any one of the available standardized measures to harmonize indicators of food insecurity and inform interventions that can benefit the largest number of people. In reality, the experience of food insecurity is specific to context. Food insecurity has different determinants across geographical contexts including rural, urban, slum, developing and developed countries (Boero et al., 2021; Dudek & Myszkowska-Ryciak, 2020; Smith et al., 2017). Food insecurity has also been assessed among different population groups including farmers, urban dwellers, children, the elderly, women of reproductive age and persons affected by conditions such as HIV/AIDS (Amiresmaeili et al., 2021; Owoo, 2021; Radimer et al., 1992; Wolfe et al., 2003). Urban dwellers may be more food insecure due to the cost of buying food and low access to gardening opportunities (Owoo, 2021) and, the elderly may be affected by decreased access to income or poor care from other family members (Wolfe et al., 2003). Notwithstanding the diversity of contexts, there are some similarities: low income, low educational attainment, and belonging to a minority or marginalized group is related with food insecurity. As multiple studies have established, food insecurity has implications for nutrition status and health outcomes, and efforts to address food insecurity must be accelerated if we will meet crucial Sustainable Development Goals.

The objective of this chapter is to describe how women and men in a rural African tobacco farming region describe the factors that shape their experience of food insecurity. The paper seeks to describe if and how tobacco farming is implicated in food insecurity from the perspective of people with lived experiences affected by tobacco growing.

5.1 Background

In sub-Saharan Africa, even though agriculture remains the biggest contributor to rural economies, the proportion of food insecure people has increased in the last five years (FAO, IFAD, UNICEF, 2021). Rural people depend on subsistence agriculture for food and income thus link between food insecurity and agricultural production is stronger than in some other contexts (Quisumbing et al., 2014).

A significant body of literature has examined why farmers may be food insecure - identified determinants include low productivity and poor crop diversification, climate factors, agricultural skills, inadequate access to financing or technologies that enable access to information and markets (Karki et al., 2021; Maziya et al., 2017; Silvestri et al., 2015). Studies have investigated cash crop production with considerations for crops grown on plantations, like oil palm, cocoa, tea or coffee or horticultural crops (Hashmiu et al., 2022; Hassen et al., 2016; Na et al., 2017; Quisumbing et al., 2015; Silvestri et al., 2015; Wichern et al., 2017). Some of the literature has also assessed the connection between cash crop production, household income and household food security, with mixed evidence (Hashmiu et al., 2022; Herrera et al., 2021; Rubhara et al., 2020; Tankari, 2017). In some cases, cash crop production was found to be positively correlated with food security (Rubhara et al., 2020) but in others, the production of cash crops negatively impacted household welfare relative to food security (Tankari, 2017). Food insecurity was found to prevalent in 68.8% of coffee producing households in Ethiopia (Hassen et al, 2016). Hashmiu and colleagues (2022) found that investments in the cash crop cocoa only enhanced food security if the income from cocoa enabled farmers to expand food crop production.

Recently, there has been considerable interest in the experience of food insecurity among smallholder farmers involved in growing non-food cash crops like tobacco. The literature on this specific interaction is sparse but evolving. One study finds that smallholder tobacco growers in

Zimbabwe may be more food secure because the income they earn from tobacco increases access to off-farm food options (Rubhara et al., 2020). However, it also cautions that there is no direct link between the income earned from tobacco growing to household food provision and recommends further studies on the cash-food crop mix. Such studies will help to more fully understand how tobacco farming affects household food security.

This investigation must also involve examining the roles that women in smallholder farming households play and the burdens they bear. Smallholder farmers, mostly comprised of "mom-and-pop" style family enterprises, produce up to 80% of the world's food supply (Lowder et al., 2021). Women constitute just over forty percent of this global agricultural workforce, and in sub-Saharan Africa they account for up to one-half of agricultural labour (Raney et al., 2011). As part of households, women may work for up to ten hours daily on productive and reproductive tasks (Komatsu et al., 2018). Ensuring household food security means that women combine productive and reproductive roles including farming, marketing, food processing and purchasing, as well as allocating food at meal times (Quisumbing et al., 2014).

Research has indicated that household food insecurity may be more sustainably addressed if smallholder farmers engage in off-farm income generating activities in addition to farm work (Kidane et al., 2005; Silvestri et al., 2015). In general, opportunities for off-farm work are limited in rural communities and taking on off-farm work increases time burdens for women due to their combining economic and care-giving responsibilities. For women in tobacco growing households, opportunities for off-farm work will be especially limited because the labour and time requirements for growing tobacco are so intense that , after accounting for reproductive tasks, there is little time available for other types of work that could positively impact on women's income and autonomy (Babalola, 1988).

Tobacco farming has had significant adverse effects in communities where its adoption has been expanded (Arcury & Quandt, 2006). Commonly reported effects include deforestation, which has consequences for soil stability and quality, and eventually, crop harvests (Lecours et al., 2012a). These environmental effects may have long-term consequences for food security however, these effects are not the focus of the present study. In the short-term, food insecurity may be shaped by factors unrelated to soil quality. A study in Kenya describes a low standard of living among tobacco farmers and food insecurity as a result of growing tobacco, related in part to significant time allocation to tobacco at the expense of food crops (Khisa, 2019).

In Zambia, land under tobacco cultivation and tobacco leaf production has increased (see Figure 1, Chapter 1). In addition to the South, Central and Eastern provinces, where commercial scale tobacco farms are more common, Nkeyema district in Western Province is significantly important for tobacco growing because of its favorable soils and rainfall patterns. In this district, most tobacco farmers are smallholder farmers who grow tobacco under contract to several leaf buyers.

In the absence of indicators from Nkeyema district, available provincial data from the 2018 Zambia Demographic and Health Survey (ZSA et al., 2019) demonstrates that nutritional indicators are, in some cases, worse than national estimates. Among women aged 15 – 49 years old in Western Province, 38% are estimated to suffer anemia compared with the national prevalence of 31%. Similarly, the prevalence of anemia in children 0 – 59 months is 61% whereas the national prevalence estimate is 58%. At 29%, stunting prevalence in Western Province is lower than the national prevalence estimate (35%), but Western Province is still off track to meet targets set in the Malabo Declaration (Haddad et al., 2015). Stunting, a marker of chronic undernutrition, is an outcome of food insecurity.

Nkeyema district is described as the main source of food for Western Province so, it is important to interrogate how tobacco farming may be influencing food insecurity in this area. The answers provided by this study will inform ongoing efforts to strengthen food and nutrition security in Western Province, Zambia and sub-Saharan Africa in general.

5.2 Methods

Mixed data was used to answer the question posed by this study: why tobacco growing households experience food insecurity to illustrate the prevalence of food insecurity in the population of tobacco growers as well as provide some explanations for this occurrence. Quantitative and qualitative data were collected between October 2020 and December 2021. Quantitative data for this study was collated from a cross sectional survey with data from 159 tobacco growers at the end of the 2019/2020 (n=43) and 2020/2021 (n=116) farming seasons. Tobacco growers were from eight zones that are part of the Nkeyema agricultural block in Western Province, Zambia. The recruitment process has been described in detail in the previous chapter.

Notes from focus group discussions and interview transcripts comprised the qualitative data set. Focus group discussions were conducted with five groups of respondents totalling 42 community members (male, 15; female, 13; youth, 7; community leaders, 7) from among the communities that comprise Nkeyema agricultural block. Permission to recruit community members into these focus groups was secured from district officials, traditional rulers, and natural community groups while recruitment of participants to FGDs was facilitated by leaders of community groups. Given the potentially sensitive nature of discussions about women experiences and rights, focus group discussions were held with women separately from men. Each group had no more than eight participants to maximize the opportunity for robust discussions. Meeting dates and times were agreed with group leaders and before each meeting started, invited participants

were informed in detail about the purpose of this study and informed of their right to decline answering any questions or to withdraw with no consequences if they chose. Participants provided their verbal consent and engaged in group discussions facilitated by a local research collaborator from the Centre for Primary Care Research, Lusaka, Zambia.

A final group of participants were drawn from the community, government offices, academia, and civil society (19) to participate in in-depth interviews. They were recruited through both a purposeful and snowball sampling strategy with the aim of achieving maximum variation in participant perspectives (Kitto et al., 2008). Participants were sent information letters by email, and they sent back signed consent forms if they consented to participate. Interview dates and times were agreed with the researchers and conducted over Zoom (or with the consent of the participant, via WhatsApp where connectivity challenges limited the use of internet data for Zoom). For interviews conducted over Zoom, participants were advised that the interviews would be recorded to facilitate data collection, but they did not have to sign in with their actual names and they could leave their video cameras off. Interviews were conducted in English and lasted for a duration ranging between 45 and 65 minutes. Recruitment and interviews were conducted until data saturation was reached (Morse, 2015). All recordings were transcribed verbatim in MS Word, leaving out any identifying details.

Survey data collection was conducted separate from but concurrent with interview data. Survey data were analysed in SPSS (version 28) for summary descriptive statistics and qualitative data was organized and coded in NVivo (version 12) and analysed for emergent themes through an inductive process following the principles of constant comparison (Boeije, 2002). Quantitative and qualitative data provided complementary inferences, and data from FGDs were triangulated against data from in-depth interviews.

5.3 Findings and Discussion

This section describes the findings from a study to explore how growing tobacco – a non-food cash crop – shapes how farmers experience food insecurity in a tobacco growing area of Western Province, Zambia. Overall, tobacco growers have mixed experiences with this livelihood option. Perceptions of profitability remain strong, but stressors associated with this livelihood that have impacts on household food insecurity are also recognized. First, the section uses quantitative data to provide an estimate of the prevalence food insecurity in this sample population. Next, it presents participants perceptions about tobacco growing and how the challenges they experience with food insecurity are shaped by tobacco growing. Overall, to the extent that a significant proportion of tobacco growers experience food insecurity, prevailing perceptions of profitability obscure the fact that this livelihood option has adverse implications for food and nutrition security.

5.3.1 Prevalence of food insecurity among tobacco growers

Findings presented in the previous chapter show that, in general, tobacco growers have greater incomes than non-tobacco growers but can still experience food insecurity. Thus, this section provides estimates of the prevalence of food insecurity in tobacco-growing households to provide a basis for understanding challenges with food insecurity in this sample.

The socio-demographic characteristics of tobacco growers [n=159] are presented in Table 1. Male participants were twice as many as female participants, and male headed households comprised 77% of the sample. The mean age of respondents was 41.6 years (standard deviation, SD, 12.5). Households had an average of eight members, higher than the national average of six members (Zambia DHS, 2018). Almost fifty-two percent of participants had completed secondary school - that is up to Grade 12 - and the median net income of tobacco growers was estimated as

18,000 Kwacha [US$892]. The mean size of farmlands was 20.1 hectares (SD, 21.8 hectares) and household staple food stores lasted for a mean duration of 8.7 months.

Using the Household Food Insecurity [Access] Scale (HFIAS, Coates et al., 2007) households are categorized as food secure, then mildly, moderately, or severely food insecure. The assessment process has been described in the previous chapter. The prevalence of food insecurity in the sample was 28.9%, and 15.7% of tobacco growing households were assessed as experiencing severe food insecurity. The mean HFIA score for this population was 2.44 (SD, 4.9).

In this population, while over 70 percent are assessed as food secure, 5.7%, 7.5% and 15.7% of households experienced mild, moderate, and severe food insecurity respectively. Furthermore, 23.3% of households reported experiencing some anxiety or worry about household food access and 22.9% of households reported eating food of insufficient quality or food they did not prefer. 12.6% reported not eating sufficient food or sometimes going to sleep without eating.

At nearly 30 percent of the sample, the proportion of tobacco growing households assessed as food insecure is significant enough to justify a query into the reasons why this is so. Qualitative data provides some illumination that is discussed in subsequent sections. First, the data provide participants' explanations for why tobacco growing remains a preferred livelihood option, then it illustrates how tobacco growing displaces food production and finally, draws attention to practices that heighten the risk of food insecurity in this population.

Table 6.1

Characteristics of tobacco growing households (n = 159)

Socio demographic characteristics	% (n)	Farmer characteristics	% (n)
Sex of respondent		**Tobacco farmer type**	
Male	66.7 (106)	Contract	83.0 (132)
Female	33.3 (53)	Independent	17.0 (27)
Sex of household head		**Own land with title deed**	
Male	77.4 (123)	Yes	96.6 (112)
Female	22.6 (36)	No	3.4 (4)
Age		**Farm size**	
18 - 39 years	49.7 (79)	Less than 12 hectares	38.4 (61)
40 - 59 years	41.5 (66)	12 and more hectares	61.6 (98)
60 years & above	8.8 (14)	**How many years grown tobacco**	
Mean (SD)	41.6 (12.5)	Less than 5 years	49.7 (79)
Marital status		5 years and above	42.1 (67)
Single (Never married/ Widowed/Divorced/Separated)	24.5 (39)	Not stated	8.2 (13)
Married	75.5 (120)	Mean number of years farming tobacco (SD)	6.2 (5.6)
Number of residents in the household		**Net income (Kwacha), median, IQR**	18,000 (30,750)
1 - 4 members	15.1 (24)	Below median	46.5 (74)
5 – 8 members	49.1 (78)	Median and above	49.1 (78)
9 & above	35.8 (57)	Not stated	4.4 (7)
Mean number of household residents (SD)	7.8 (3.7)	**Staple food eaten in household**	
Number of workers		Maize	98.7 (157)
None	25.8 (41)	Cassava	0.6 (1)
1 - 4	52.8 (84)	Not stated	0.6 (1)

Table 6.1

Characteristics of tobacco growing households (n = 159)

Socio demographic characteristics	% (n)	Farmer characteristics	% (n)
5 and more	4.2 (10)		
Not stated	15.1 (24)		
Number of children under 5 years in household		**Source of staple food**	
Less than 3	72.3 (115)	Own farm	95 (151)
3 & above	27.7 (44)	Buy from market	2 (1.3)
Highest level of education attained		Neighbouring farms	3.8 (6)
None	4.4 (7)		
Primary (Grade 1 - 7)	36.5 (58)		
Secondary (Grade 8 - 12)	51.6 (82)	**How long staple food lasts, months**	
Tertiary (College/University)	7.5 (12)	< 3 months	3.1 (5)
Occupation		3-6 months	17.6 (28)
Not stated	0.6 (1)	7 – 10 months	34.6 (55)
Farmer	96.2 (153)	> 10 months	44.7 (71)
Others (trader, hunting, civil service, skilled trades, etc.)	3.1 (5)	Mean, months (SD)	8.7 (2.6)

Table 6.2

Prevalence of food insecurity among tobacco growers

Food security status	% (n)
Food secure	**71.1 (113)**
Mild food insecurity	5.7 (9)
Moderate food insecurity	7.5 (12)
Severe food insecurity	15.7 (25)
Total food insecure	**28.9 (46)**

5.3.2 Tobacco growing is a preferred yet unsustainable livelihood strategy

Literature has established that tobacco growing is perceived to be lucrative and is therefore promoted as a secure livelihood and poverty-reduction strategy for smallholder farmers in low- and lower middle-income countries (Appau, Drope, Witoelar, et al., 2019; Drope et al., 2018; Goma et al., 2017). This perception is similarly reflected in both quantitative and qualitative data collected by this study. As almost half of the sample of tobacco growers reported growing tobacco for less than five years (see Table 6.1), this study also sought to explore their considerations for growing this crop.

The most common reason that farmers gave for choosing to grow tobacco was related to income, as when asked to name and comment on the relative profitability of crops grown in the area, tobacco growers and other community members said that "*Tobacco is the only crop that brings big, fat money compared to any other crop in Zambia*." (P5, M, Tobacco farmer). They also said that "*tobacco farming has given Nkeyema people a lot of money… and because of that, most farmers have continued to grow tobacco*." (P6, F, Government official). This assertion is unsurprising given that the median net income reported for tobacco growers 18,000 Kwacha [US$892.41] is significantly higher than the median net income of 1,200 Kwacha [US$72] in a mixed sample in the same area. In addition to the general perception that "*tobacco is more profitable*," when asked to comment on the future of tobacco growing in the area, participants supported continued investment in tobacco growing. This sentiment was most expressed by the youth in these words, "*Tobacco has brought much development in our community, it has to continue*." (FGD, M, Youth).

However, as other research has demonstrated, after all input costs are accounted for, smallholder tobacco growers operate at net loss (Drope et al., 2018; Goma et al., 2017). Some participants in this study acknowledge operating unprofitably after input costs are accounted for

and describe this outcome as having, "*no change"* [meaning, 'no profit'] (P1, M, Tobacco farmer coordinator). Furthermore, the low quality of basic infrastructure such as roads, health centres and schools observed in the area belies the claim that tobacco growing has brought development to the community or to the people of Nkeyema as some said. An interview participant said, "*We are facing a lot of health challenges because people must travel 74km from here to Kaoma* [the nearest town] *to access secondary health facilities, … and care for diseases that rural health centres cannot manage.*" (P8, M, Traditional leader). This statement also indicates that the tobacco growing area in Nkeyema, also called TBZ village [Tobacco Board of Zambia village] is a rural area, served by a basic level of social infrastructure consistent with rural areas in low- and lower middle-income countries.

According to interview data, any perceived profitability of tobacco growing is more closely associated with access to agricultural inputs, a ready market and lump sum payments. The next most common reason given for growing tobacco is access to inputs like fertilizer, seeds, and equipment, which the tobacco industry advances to its out-growers on credit. As one interviewee says, "*We have no problems on tobacco farming because the company itself gives or distributes some healthy equipment that we use during farming*." (FGD, M, Youth). 'Healthy' equipment refers to personal protective gear like gloves, overalls and goggles given to tobacco farmers, the cost of which is deducted from payments made after sales. Wearing these protective outer garments may help to protect tobacco growers from known health risks of tobacco growing like pesticide exposure and dermal exposure to nicotine (Faria et al., 2014; Fassa et al., 2014; Riquinho & Hennington, 2014). Dermal exposure to nicotine is implicated as a cause of green tobacco sickness and happens when farmers handle wet tobacco leaves (Schmitt et al., 2007). As the interview data

shows, getting these protective items from the tobacco industry causes farmers to perceive the industry as being mindful about their health and wellbeing.

The choice to grow tobacco is driven by economic expediency - farmers invest in growing crops for which ready markets exist with an expectation of profit. In consideration of this, the contract grower scheme deployed by the tobacco industry facilitates market access and relieves the farmer of the burden of seeking a market for their tobacco crop. For instance, Japan tobacco international (JTI) has operations in Nkeyema – a distance no more than 60km from the farthest farms. Tobacco growers contracted by JTI can more easily travel to the JTI complex instead of traveling 387km to auction floors in Lusaka where independent tobacco growers must go. While other leaf buyers in the area (Alliance One, Tombwe Processing Limited) do not have local offices, they employ extension officers who also collect tobacco bales from the farms under contract to them.

The price fetched by the crop is an equally important priority along with payment timing. The price per kilogram of crop yield influences the farmer's choice of crop to grow in each farming season. At the time of this study, farmers claimed that the price obtained per kilogram of tobacco exceeds the price obtained for one kilogram of any other crop, for instance the staple food crop maize. In addition, once tobacco harvests are cured and tied in bales, tobacco leaf buyers will inspect for quality and, after deducting loans owed, pay its out-growers in cash upfront. On the other hand, the Zambia Food Reserve Agency is the main buyer of maize and is known to delay payments for several months.

Notwithstanding the foregoing, several interviewees assert that income from tobacco is not as postulated, with one saying: "*No, not more. I didn't say the money they get from tobacco is*

more, I said the money is readily available… the market is always available for tobacco." (P12, M, Health worker)

It is commonly acknowledged that growing tobacco is more labour intensive than growing other crops. This labour cost has previously been addressed as an economic issue in terms of the poor return relative to the amount of effort expended (Drope et al., 2018; Leppan et al., 2014; Makoka, Drope, et al., 2016). However, it must also be recognized for the opportunity cost that tobacco growing incurs in terms of decreased household access to food and consequent food insecurity.

An interesting finding of this study is the disparity between summary statistics and interview data. Summary statistics in Tables 6.1 and 6.2 indicate that tobacco growers are more food secure than not, but interview data suggests that the labour-intensive nature of tobacco growing interacts with other determinants to contribute to shaping food insecurity among tobacco growers. This is elaborated on in the next section.

5.3.3 Tobacco growing displaces food crop production

Table 6.2 indicates that food insecurity (FI) affects almost one-third of this population sample, with 15.7% assessed as experiencing severe food insecurity. The data also showed that significant proportions of food insecure tobacco growers experience all three domains of food insecurity. How FI is shaped by tobacco growing is rarely described in the context of sub-Saharan Africa but evidence from this study illustrates that tobacco growing presents a risk for food security. For instance, the excerpt below narrates:

> "*To start with, this tobacco farming, it's like it's going up and the food crops going down. So, it is bringing a lot of challenges where food security is concerned. So, for families who do 100% tobacco farming, they struggle a lot…From October to March,*

they are farming tobacco and the little food crops they harvested have been exhausted. So, they are missing out a lot of things like nutritious food." (P12, M, Health worker)

Another participant expresses a similar concern in these words; *"...the other issue which I've seen at household level is food insecurity, 'cause tobacco is a jealous crop …So, you will find that farmers will just concentrate on the tobacco...*" (P15, F, NGO worker).

Despite the presence of a ready tobacco market, merely growing tobacco does not guarantee access to this market. Outputs must meet predetermined quality and price standards set by the tobacco industry with no input from farmers. To earn the highest possible price per kilogram, intensive time and effort must be invested to ensure that harvested and cured tobacco leaves are of a quality acceptable to the tobacco industry. The outcome is that a large portion of each day out of the ten months needed for tobacco production (nursery development through to transplantation and maturation, curing and baling) must be devoted to ensuring the yield of a high-quality tobacco leaf harvest. An interviewee says, "*tobacco production is labour demanding, so...for you to produce a good crop under tobacco, it means most of the time is spent on tobacco*." (P3, M, Agriculture officer).

For farmers to increase their chances of getting a high-quality harvest, household labour assets are primarily deployed to tobacco growing. In their words, "*... all the concentration is focusing on the tobacco for it to come out nicely*." (P15, F, NGO worker). Farmers who can afford to do so complement household labour by hiring as many as four migrant workers per hectare of land cultivated. As the data in Table 6.1 shows, about 26% of tobacco growers are unable to hire additional workers and must rely solely on household labour. The relatively larger household sizes among tobacco growers compared with non-tobacco farmers in the area may be impacted by the presence of workers in tobacco growing households, or it may be that farmers with larger

household sizes and greater access to household labour may be more likely to choose to grow tobacco, but this needs to be further examined.

Once registered with a leaf buyer, tobacco growing households are supervised by agriculture extension officers employed by the tobacco industry. These extension officers visit farms regularly to ensure that farmers undertake the work required to attain the desired harvest quality. This level of supervision is unmatched by the government or other agriculture service providers.

Overall, tobacco growing often means that, intentionally or not, the farmer's labour is allocated to other than food crops. Household production of food is lowered due to the diversion of household labour to tobacco growing. Indeed, interview data shows that the tobacco industry requires registered out-growers to have staple food stores from the previous season; "*Tobacco needs land and then a farmer needs food because the period for tobacco is about ten months. So, you need to have food in stock to sustain you from the day you start the project up to the end*" (P17, M, Tobacco extension officer). This likely explains why, on average, households report having staple food stores that last more than eight months while growing maize for household and worker consumption in the next tobacco growing season. Critically, it also suggests that tobacco buyers likely select farmers who are better resourced and food secure whether they grow tobacco or not.

Notwithstanding, some interview accounts still indicate that the quantity of food crops grown is insufficient, as an interviewee said, "*…they grow less food crops and … more of tobacco. So, … before the year ends, the food that they had grown will finish. Tobacco is a jealous crop - it wouldn't give them enough time to manage these other crops*." (P4, M, Agriculture officer).

Tobacco growers may reasonably be expected to have food stores from the previous season to support household food security in the growing period of the next season. However, some interviewees said that tobacco growers ran out of food because "… *a farmer who grows tobacco may grow 5 hectares of tobacco but only 1 hectare of maize; he harvests 10 bags and maybe they can reach December*," (P1, M, Tobacco farmers coordinator). Plausible explanations for the disparity between these assertions and survey data include that tobacco growers may be over-reporting how long their staple food stores last. Additionally, tobacco growers may attribute the duration that food stores last to the periods they buy food from the markets or neighbouring farms because P1 also says that when they run out of food, "*they sell tobacco to black market tobacco vendors and get money to buy food*." (P1, M, Tobacco farmers coordinator). Black market tobacco vendors [also called briefcase buyers] are tobacco buyers who may have obtained out-grower licenses without being farmers or may be selling tobacco, as middlemen, on the auction floors at major market centres. Even though these buyers operate outside expected parameters, their activities are not necessarily illegal. Indeed, they may be a valuable stop-gap intervention for smallholder tobacco growers who run out of food in the middle of the farming season and have little option but to exchange a cash advance for a commensurate quantity of cured tobacco leaf given to these buyers at harvest time. That these farmers sell their tobacco at lower prices to such buyers is accepted as an unavoidable consequence.

5.3.4 Cash fails to replace lost production capacity

Tobacco farmers commonly grow other crops but distinguish between the cash and food value of their agricultural investments. An interviewee says, "*with the coming of tobacco, farmers might just grow enough maize for their own subsistence while they get their cash from tobacco*" (P16,

M, Academia). Survey data shows that all tobacco growers also grow maize, but maize harvests are likely insufficient to meet household food needs year-round.

If cash is the main incentive for tobacco farming, it may be assumed that tobacco farmers earn sufficient income from tobacco farming to replace their displaced food production capacity by buying food from local markets. However, interview data contradicts this assumption. An interviewee says, "*... after concentrating on tobacco, immediately they sell their crop, they'll be able to buy food, only for two or three months maybe*." (P15, F, NGO worker).

From interview data, two main pathways by which income earned from tobacco growing is insufficient to replace lost own food production capacity emerge: (a) insufficient income earned (b) income earned is misspent or directed to non-food assets.

(a) Insufficient income earned*:*First, the tobacco industry advances inputs to tobacco growers on credit. Even though contract tobacco growing guarantees a buyer and to some extent, a price per kilogram of cured tobacco leaves, evidence from this study and others (Appau et al., 2019; Makoka et al., 2017) show that farmers actually pay more than prevailing market prices for inputs procured through the tobacco industry. Additionally, most farmers do not account for their labour costs when estimating the cost of growing tobacco, so in reality, when overpriced inputs and labour costs are taken into account, most farmers are operating at net loss (Drope et al., 2018; Makoka, Appau, et al., 2016). A tobacco farmer in this study puts it thus, "*as small-scale farmers, due to your loan obligations when the people giving you loans have recovered their loan, you end up with little or nothing at all*." (P13, M, Tobacco farmer). Another challenge is the grade assigned at the time of selling the tobacco leaf, and therefore, the price obtained. When farmers bring in tobacco bales, the industry recovers its costs first then renders to farmers whatever money is left over. Frequently, this amount is lower than projected because the

assigned grade is lower than expected even after farmers have adhered to the advice provided by tobacco extension agents. So, in many cases, farmers are left with insufficient income, described by farmers in this study as having "*no change*," meaning no profit. The consequence to food crop production is evident as an interviewee said "…*farmers don't have monies to buy enough* [inputs] *to grow enough maize to sustain them throughout the season*." (P5, M, Tobacco farmer).

Further, evidence indicates a vicious interaction between labour displacement and tobacco growing contracts that lowers the potential income earned for some farmers. Because tobacco farmers are not producing enough food to account for year-round access to food, they face a scarcity crisis when the lean season hits between November and March. To cope with this crisis, as indicated in the previous section, tobacco growers sell a portion of their designated harvest to "briefcase buyers" for advance cash payments that they use to feed their households and any hired workers during the growing season. As a result of this exchange, such farmers often fall short of the quantity they were contracted by the industry to grow, default on the input loans they received, and, if their grower licenses are not cancelled outright, they end up in a cycle of debt to and dependency on the tobacco industry. The narrative shared by an interviewee expresses this challenge,

> "*They get money from black market tobacco vendors. They sell to these people and get money to buy food… So, at the end of the farming season, they have less tobacco to fill their quota. That's why you find some even fail to meet the targets. As a result, they fail to pay back the loans*." (P1, M, Tobacco farmers coordinator).

(b) Income earned is not saved or is misspent on non-food assets Next, multiple interview accounts show two main behavioural patterns observed to be inconsistent with ensuring household food security. These are illustrated by the excerpts below:

(i) Not saving enough of the income to ensure household food access:

"*Whenever [they] sell [their] crop, [they] withdraw everything, so they don't think for tomorrow. They will just think for today; they just buy something enough for a month or two months and they are unable to save the money. You find that in two or three four months' time, farmers who had grown tobacco will have no food at household level*." (P15, F, NGO worker)

"*Because when cultivating tobacco, within a season you can get about 50,000 - 100,000 Kwacha* [US$ 2,479 – US$5,498]. *The only challenge would be - you know when you have bags of maize, it's easy to keep them for food. But it is very hard to keep the money*." (P3, M, Agriculture officer).

(ii) Spending most of the income earned on non-food household assets:

"*[We] see them excited in this small town when they have money. We see them buying all sorts of unnecessary things…This is a person with a lot of money two months ago… now they are even failing to have three meals in a day*." (P12, M, Health worker).

"*They end up buying various items like radios, TVs, bicycles, solar panels and so on. At some point, they will end up selling those items*." (P2, M, Agriculture coordinator).

"*But what we've seen is just after selling, they'll be celebrating, playing music in the community… after two weeks, the money will vanish. They will drink, give out to the women, you know, things like that*." (P7, F, Health worker).

5.3.5 Household cooperation norms in labour allocation to tobacco growing displaces food crop production

In the study context, both men and women express the choice to grow tobacco as necessary to secure household income for food and non-food needs. Therefore, they see themselves as being jointly responsible for farming, making decisions about the sale of their harvest, and budgeting and allocating income to expense categories. In their words, "*We work together, we decide together*." Similarly, concerning various aspects of household decision-making and enacting the household livelihood strategy, participants in a series of focus group discussions asserted that: "*A woman and a man come together on decision making*" (FGD, Woman); also saying that, "*both men and women help each other on cultivating*" (FGD, Man) as well as that "*both a wife and husband sit and make a budget*" (FGD, Man).

Regardless of how common this perception of co-operation is, it is simultaneously communicated that women's productive labour is directed to tasks over which they may not exercise choice. We probed to determine whether household members are allocated farming tasks in a manner that ensures adequate attention is given to food crops as well as to tobacco. The excerpt below illustrates what happens:

> "*Tobacco labour is quite extensive. There's no way they* [growers] *can divide themselves, and they have not been dividing themselves. Had it been that way, then they're going to sustain themselves. But tobacco growing is given preference to other crops. So, men usually co-opt women. They are forced to be on tobacco farming [rather] than other crops. Very little time is given to other crops*." (P9, M, Community leader)

In addition to the labour on tobacco farms, women also undertake non-farm tobacco related work, as illustrated in the quote below regarding the recruitment of workers:

"*So, I* [the interviewee] *asked her* [a female tobacco grower], *why should you come to recruit, why didn't your husband come to recruit the labour? Then she said women are more trustworthy so the people who are being recruited are more likely to believe* [the wages and working conditions offered] *if it's a woman that is recruiting them than if it was another man*." (P16, M, Academia)

To place the quote above in context, on a journey across the province, the interviewee met a woman going to recruit workers for the family tobacco farm and asked her why she did this rather than her husband. Her response indicates that while women deploy physical skills in service to tobacco farming, they also deploy inter-personal skills and social capital.

Notwithstanding the foregoing, it is interesting to note that the high level of intra-household co-operation suggested by study participants does not mean that women are satisfied with income allocation between food and non-food needs. According to interview data, "*women are also involved in tobacco farming in Nkeyema, but what is at stake is how do they share the …money*?" (P16, M, Academia). Another source suggests that this dissatisfaction results in intra-household conflict, saying "*even if they* [a farming couple] *are sharing that money for the for sustenance of their families, you find that there are a lot of squabbles at household levels whereby a woman cannot make a decision*." (P15, F, NGO worker). This conflict happens because "*men think that women are not supposed to participate more because they are not the head of the house and when a woman brings an idea, men always reject her idea*" (FGD, Woman).

Low women's autonomy here is consistent with extensively documented experiences of rural women in low- and lower middle-income countries. One consequence is that women have limited opportunities to influence how much food is produced at the household level or bought

from markets when own production is displaced in favour of tobacco growing. In describing this determinant of household food insecurity, a participant says,

> "…*You know, when you give a woman a 100* [Zambian] *kwacha, the first thing they will think is their household in terms of food and other things. But same 100 kwacha you give to the husband, he'll probably go for a beer. Men don't think more about the food at home. So, the women, they don't have that power over the income at home*" (P12, M, Health worker).

5.4 Framing findings

Despite the negative economic, environmental, and health impacts of tobacco growing, and interventions to promote alternative livelihoods in tobacco growing regions, the initial response of smallholder farmers is to describe tobacco growing as viable. In addition, the food security consequences of tobacco growing are unrecognized. This study shows that, among tobacco growers, economic, policy, socio-ecological, and normative behavioural factors connected with tobacco growing intersect to result in food insecurity.

Farmers and other community members expressed mixed opinions about the value of tobacco growing to the area. Whereas some continue to offer the opinion that tobacco growing is associated with positive economic and development outcomes, others are conscious of the nutritional, economic, physical, and social stresses associated with tobacco growing.

Farmers in this tobacco farming region acknowledge that growing tobacco is a non-food investment fraught with complications but struggle to argue against its value as a cash crop. Among smallholder farmers in rural, sub-Saharan Africa, it appears to make economic sense to continue growing tobacco because the structural supports provided by the tobacco industry are not matched or surpassed by non-tobacco stakeholders in the agricultural sector. Neoliberalist approaches to

economic development implemented following the structural adjustment programs of the 1980s fostered trade liberalization in the agricultural sector. Capitalist approaches to agricultural resource extraction disadvantaged smallholder farmers whose low incomes made it challenging to afford farming inputs: seeds, fertilizers, other agrochemicals, farm equipment, and transportation vehicles. Since 2002, the Government of the Republic of Zambia [GRZ] has attempted to mitigate challenges with access to agricultural inputs by (i) providing subsidized inputs through the Farmer Inputs Subsidy Program [FISP] through which farmers may access seeds and fertilizers for maize and a few other crops (Mason & Tembo, 2015a) (ii) purchasing maize through the Food Reserve Agency [FRA] (Mubanga & Ferguson, 2017). However, Mason and Tembo (2015) have described challenges with FISP and interview data suggests that farmers are not satisfied with the prices they get for maize through the FRA or the private sector.

Agricultural livelihoods are shaped by factors that inform viability: which crops thrive in the specific agroecological zone, access to inputs and credit, market availability (including transport to markets), and market price for the crop. While the first factor is mediated by environmental and climatic conditions, the tobacco industry has engineered supply chain management of the other factors to advantage tobacco over other crops. The cost of agricultural inputs is not borne by the farmer upfront, the tobacco industry provides extension services right on the farms, eases access to its market by meeting farmers at the farm gate, and finally, the lump sum payments that tobacco growers receive ostensibly provide ready cash for food and non-food needs. Findings similar to this have been described to explain why farmers continue to grow tobacco in Indonesia, the Philippines and several African countries including Zambia (Appau, Drope, Goma, et al., 2019; Appau, Drope, Witoelar, et al., 2019). At the same time, the tobacco industry ensures that these factors of production result in more profit for the industry, not the

farmers. Some farmers have called for better contract conditions whereas others suggest that collective action through farmer cooperatives could help smallholder farmers work independently of the tobacco industry to gain access to credit and other resources as well as surmount barriers such as high transportation costs (Appau, Drope, Witoelar, et al., 2019). It is worth noting that without the contract grower scheme, the tobacco growing business is unlikely to have flourished in Nkeyema and Kaoma to the extent that it has.

In any event, the relative greater income provided by tobacco growing does little to mitigate food insecurity (FI), shown to affect over 28 percent of tobacco growing households in the area. It may exacerbate FI since the income earned does not fully contribute to mitigating displaced household food production capacity. Even farmers that consider tobacco growing to be the most viable income generating livelihood option acknowledge its excessive labour demand compared with other crops. They complain of earning lower returns compared to the amount of labour expended on the crop. Overall, farmers allocate less than half of their arable land to tobacco growing, but because tobacco growing and food crop production overlap in a manual, rain-fed agricultural system, the labour allocated to tobacco farming is lost to food crop production. The chronicity of this challenge also indicates that major shifts are required to reverse prevailing trends.

Hu and Lee (2016) have indicated that women and men share tobacco growing labour in Africa but this study has shown that patriarchal norms and customs interact with intra-household co-operation norms to influence how household labour is allocated to agricultural activities, and incomes to food and non-food needs (Anderson et al., 2017; Shibata et al., 2020). As a result, women are unable to take actions that could mitigate household food and nutrition insecurity. Interventions that seek to reduce household food insecurity through increased agricultural productivity without addressing the constraints women experience as outcomes of interacting

cultural norms and intra-household bargaining will result in limited benefits and likely result in additional burdens for women.

Strengthening agricultural livelihoods in defense of food and nutrition security also means recognizing that farmers need income for food and non-food expenses. In other contexts as well as with other crops, farmers face challenges with formal access to credit for agricultural inputs that affect productivity and household income (Rapsomanikis, 2015). Governments and other development stakeholders could adopt the strategies used by the tobacco industry to improve access to inputs, technical support, and markets for food crops that support achieving food and nutrition security.

At the time of conducting this study, tobacco farmers reported on their intention to divest some land and labour from tobacco growing into soybean production because its market has recently expanded. Furthermore, it is less labour intensive making it an attractive option to current tobacco growers. The labour saved by growing soybean may be directed to off-farm income generating activities thereby allowing smallholder farmers to build more resilient livelihoods that would be protective of food security. Other benefits of growing soybean include an observation that soybean food derivatives can enhance nutrition security, and like other legumes, soybean has nitrogen fixing properties that make it valuable for restoring soil quality in areas that have been degraded by tobacco growing. However, interviewees could not describe market access for soybean meaning that more can be done to strengthen the soybean supply and value chain. For instance, interventions can be developed to facilitate access to soybean markets and increase the inclusion of soybean food derivatives in local diets in culturally acceptable ways.

5.5 Limitations of findings

Study limitations affect how generalizable these findings are to other contexts. First, though every effort was made to recruit participants from the tobacco industry, their reluctance to be interviewed meant that we were unable to probe the extent to which the industry facilitates food security for its growers. There was some indication that growers also receive maize and groundnut seeds as part of the inputs advanced by the tobacco industry, but it was not clear if the tobacco industry also bought the resulting harvest or if growers could use those assets for their own purposes.

Secondly, experienced researchers facilitated all focus group discussions, but it is possible that the opinions of more vocal participants dominated responses. Furthermore, facilitators had to switch between English and Nkoya [the local language] so it is possible that some concepts were lost in translation. However, for the most part, described perspectives reflect intended meanings. Follow up FGDs may have clarified some issues identified during analysis or added more detail. For example, follow up may have helped to further illuminate specific experiences growing other crops. However, restrictions to limit the spread of COVID-19 limited opportunities for these follow up sessions.

5.6 Conclusion

The labour-intensive nature of tobacco growing in low- and lower middle-income countries has consequences for own food production as well as food and nutrition security. Even though farmers struggle under this labour demand, due to perceived profitability, access to credit, available markets, and weakness of the supply chain for food crops, farmers continue to grow tobacco without due cognisance of its short- and long-term consequences for food production.

Policies aimed at strengthening food and nutrition security in low- and lower middle-income countries need to account for conditions that present opportunity costs to growing a diverse

range of food crops. Healthy supply chains for food crops – including fruits and vegetables – are required to meet farmers' food and non-food needs.

Furthermore, such policies need to include mechanisms for strengthening women's empowerment by ensuring that household co-operations norms increase opportunities for women to influence the uptake of livelihood strategies that secure household food and nutrition security.

Chapter 6
Gendered social impacts of tobacco farming

"No [African] woman is unemployed. Only a few are paid."[6]

Agriculture remains central to rural economic development and productivity in Zambia and, in rural agricultural enterprises, women and girls constitute up to fifty percent of the workforce (Doss et al., 2018; FAO, 2018b). Working within household structures, women and girls work for up to ten hours daily (Hu & Lee, 2016) deploying their productive capacities to the creation of household livelihood assets and income. However, they rarely access the rights, benefits and privileges that may accrue from their labour and contributions in the agricultural enterprise. This chapter aims to extend the literature on the challenge of women's empowerment in agriculture by analysing data on the gendered consequences of tobacco growing in rural Zambia.

Women's rights in Zambia have long been an issue of interest. Drawing from the Convention of the Elimination of all forms of Discrimination Against Women [CEDAW] and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa [also known as the Maputo Protocol] that broadly asserts that women's economic and social well-being is dependent on rights to equality, education, health, and political participation (Rebouché, 2006), Zambia has established a variety of legal instruments and mainstreamed gender across sectoral policies in order to improve the status of women and eliminate structural inequalities. For instance, efforts in Zambia to secure the economic rights of women align with global efforts to address women's rights in economic participation; one outcome is that Zambia is among the few

[6] Discussion and Debate: Women and Employment in Ethiopia, REFLECTIONS, Dec. 2001, at 86, 87 as cited in Rebouché, R. (2006). Labor, Land, and Women's Rights in Africa: Challenges for the New Protocol on the Rights of Women. *Harvard Human Rights Journal*, 19, 235–256.

countries in Africa where women in formal employment are on par with men in labor force participation and wages (WEF, 2021). However, it is unclear how this assessment accounts for the informal work done by women in rural agricultural communities. It is also unclear to what extent policy has accounted for gender issues and for the ways in which women's work in these settings affect their health and well-being.

By making only general allusions to protecting the rights of women, the African Charter on Human Rights – the main instrument for the protection of human rights and the promotion of equality in Africa - falls short of providing specific guarantees for women's rights. This is not to claim that nothing has been done to advance women's rights in African countries like Zambia. In responding to the obligations set out by CEDAW, African states have enacted laws and provided other statutory protections for women's rights. Processes have been put in place to promote rights and create structural mechanisms that increase access to healthcare and education for girls and women (Banks, 2009). Yet, there continues to be insufficient progress on expanding women's political, economic, and social rights (Englehart & Miller, 2014; WEF, 2021), particularly for African women who work in the agricultural sector.

The lack of significant progress in expanding women's access to their economic, social, and political rights may not be due to intentional violations of obligations by party states but may be impacted by limited efforts to address the complexities that affect the economic and social rights of women, such as the links between law, context, and custom. For example, the Maputo Protocol makes some reference to women's rights in the informal sector but it is not clear what these pertain to, nor does it connect these rights to the rights to freedom from discriminatory customs (Rebouché, 2006).

Across the African continent, the approach to women's rights has been paternalistic and framed in relation to their reproductive roles in childbearing and childcare. What is more, linking the reduction of gender inequalities (Sustainable Development Goal, SDG, 5) with other development objectives such as reducing poverty and increasing food security (SDG Goals 1 and 2) may be interpreted as useful for facilitating buy-in from a broad range of stakeholders across community, national, regional, and global levels of political and economic organization and avoiding the adversarial positioning of women's rights to that of men (Cornwall & Rivas, 2015). However, it appears that such considerations interact with deeply entrenched customs, norms and attitudes to place limits to the expansion of women's rights, opportunities, and empowerment (Banks, 2009; Marcus, 2018).

Labour force participation for women in Zambia's agricultural sector is characterized by small-scale subsistence farming and related trade within family structures. Women combine economic roles with duties as wives, mothers, caregivers to elderly relatives and their participation in other community building activities. In the absence of an inclusive definition of women's work, these contributions are underrecognized. Women's work in agriculture is often seen as an obligation owed to the family, not as value created for herself. Apart from the minority who are widowed or divorced and often comprise the twenty percent enumerated as female heads of households (FAO, 2018b), women are hardly accorded an independent identity as "farmers" (Radel, 2011). Instead, women farmers are assumed to hold a farmer identity within household structures headed by their husbands or other male relatives. As a result, any examination of women's labour must also address gender relations and household decision-making dynamics.

The foregoing background informs a series of questions asked in this study, focusing on the interaction between women's productive and reproductive responsibilities with their access to

economic and social assets, and the effects that this interaction has on their well-being. These questions are posed in a context of tobacco growing as a unique representation of cash crop dominance in rural, agricultural systems.

Among the range of cash crops grown in various parts of Zambia and Africa, tobacco is one that has no food value and limited cultural value to farmers in Zambia. Farmers who choose to grow tobacco are influenced by determinants external to local market demands. How women are impacted in this setting may be understood through a critical analysis incorporating perspectives imparted by the Sustainable Livelihood Framework as well as by concepts related to empowerment - *structure* and *agency*. These concepts also enable our understanding of how operationalizing gender equality has affected the status and well-being of women in rural agricultural livelihoods (Gammage et al., 2016). Extensive research has demonstrated that growing tobacco has adverse environmental, health, and economic consequences (Drope et al., 2018; Hu & Lee, 2015; Lecours et al., 2012a; Leppan et al., 2014) but what is documented about the gendered consequences of this livelihood is dated (Babalola, 1988; Heald, 1991; Stubbs, 1985, 1987) and would benefit from critical analysis and extension.

6.1 Tobacco growing in rural Zambia as a driver of development

Profitable participation in global economic processes is a primary development and poverty reduction goal in Sub-Saharan Africa (SSA); it is anticipated to reverse the negative impacts of colonisation on production, resource utilisation, and trade, which disenfranchised African economies. “Development” for Zambia remains consistent with expectations popularized after World War II that the country will become more urban and industrial by building on an ever-increasing application of science and technology; and the government will facilitate development by introducing policies that would direct the economy towards industry, manufacture and trade

(Parpart et al., 2000). An important consideration is that these policies mainly operate under the influence of neoliberal capitalist assumptions with the market as the main arbiter of decisions, meaning that the Zambian economy has to be open to domestic and foreign private sector participation and competition (Parpart et al., 2000).

Although Zambia is a rapidly urbanizing country with significant contributions to its gross domestic production from the mining and service sectors, fifty-five percent of its population lives in rural areas making agriculture the country's largest employer in the informal sector. Persistent poverty in the rural agricultural sector has been attributed to poor investment in and development of this sector but may also be understood as an outcome of historical precedents (Bjornlund, Bjornlund & Van Rooyen, 2020). Trade systems developed during colonization introduced cash crops such as cotton, tea, coffee, and tobacco for export markets without commensurate regard for the growth of local economies (Bjornlund, Bjornlund & Van Rooyen, 2020). Growing these crops on plantations or through the extensive employment of smallholder out-growers disrupted traditional livelihood strategies that had been suited to local socio-ecological conditions (Bjornlund, Bjornlund & Van Rooyen, 2020).

Tobacco growing is assumed to be a significant source of employment and revenue for Zambia's economy. Institutional actors assert that tobacco growing aligns with the government's top priority to improve the country's economy and provide jobs for its people; this assertion contributes to a political economy that supports tobacco growing. Tobacco leaf exports account for a small percentage of Zambia's total exports, and estimates of tobacco-related employment are debatable, but institutional actors argue that tobacco is an important cash crop and a substantial source of employment for the country's farmers in the Central, Eastern, and Western provinces where tobacco is grown.

Agriculture and fishing are major income earners in Western Province, which is one of the poorest in the country. In this province, tobacco growing for export has been an important economic driver since the 1970s with activities concentrated in an area which was once part of Kaoma district, just west of the Kafue National Park. The area, called Nkeyema, was designated as an independent district in 2012 by the late President Sata. The agro-ecological climate in Nkeyema is conducive to growing a diverse range of crops, which is why this district is known as the 'breadbasket' of Western Province. It is also known as 'TBZ village' – so called because it hosts the district office of the Tobacco Board of Zambia. This naming signals the importance of tobacco growing as an economic activity in Nkeyema.

Details about the structural determinants of tobacco growing in Nkeyema, Western Province have been described in the previous paper/chapter. In summary, tobacco multinationals are efficient in the provision of inputs, credit, and extension services to contracted smallholder tobacco growers. The national government provides input subsidies to farmers, albeit only to non-tobacco growers. But it consistently fails to compete with tobacco multinationals in terms of inputs and support services. Global market demand also positions tobacco as a higher income earning crop compared to the staple crop, maize, or other crops that may be grown for both food and cash value. So, though the government focuses its support to non-tobacco growers and many farmers in Nkeyema may be unable to meet the criteria to be registered as tobacco growers, there are still strong incentives to grow tobacco.

It is important to note that prior to the 1970s, tobacco was traditionally grown by women but when tobacco became a focus of cash crop farming, it transitioned into being recognized as a man's crop (Ndiyoi, 2021, personal communication). Tobacco growers generally allocate between at least half a hectare and up to one hectare of their available farmland to the crop; a few more

hectares typically carrying tropical trees are also allocated for harvesting wood needed for curing tobacco. Agriculture in this setting is rain-fed and relies on manual labour so tobacco leaf buying companies operating in Nkeyema recommend that these smallholder tobacco growers hire enough workers for their tobacco fields to cope with the labour-intensive nature of this livelihood. Nonetheless, a significant proportion of tobacco growers rely solely on household labour for this enterprise, including women and children. The displacement of women in the shift to growing tobacco as a cash crop has implications for gender power relations and intra-household influences on livelihood-related decision-making (Shibata et al., 2020).

This study examines what specific manifestations of inequality are evident through reviewing qualitative and quantitative data, how the lived realities of rural women in tobacco growing households empower them to express agency (or not), and where opportunities exist for facilitating greater empowerment for women in this setting.

6.2 Methods

A mixed methods study of the gendered consequences of tobacco farming in the districts of Nkeyema and Kaoma, Western Province, Zambia was undertaken. The study triangulated quantitative and qualitative data to describe the proportion of women and men who allocate responsibilities for household food access to themselves to assess how women and men perceive their responsibilities for household food access. Further, it used the data to describe how women and men experience food insecurity and respond to the challenges resulting from experiencing food insecurity.

Data for this chapter were drawn from a cross-sectional survey administered to smallholder farming households and from qualitative data (notes from focus group discussions and in-depth interviews). The participant sampling and recruitment strategy was described in Chapters 3 - 5.

Descriptive analysis of cross-sectional survey data was integrated with inductive coding of data from in-depth interviews and focus group discussions to explore contextually unique issues.

Data were collected between September 2020 and October 2021. Survey data were extracted from a cross sectional survey administered to 391 participants between September and October 2020, 218 of whom were female. Data were recorded in Excel, then checked for duplicates and cleaned. Cleaned data were exported into SPSS version 28 and analyzed to generate summary descriptive statistics. Focus group discussions, FGDs (in English and Nkoya) and in-depth interviews (in English) were conducted between September 2020 and October 2021. FGDs and interviews were conducted until no new themes emerged. Interviews were transcribed verbatim into MS Word then organized in NVivo version 12, where coding was carried out. Notes from FGDs were also organized in NVivo software and coded. Inductive qualitative coding of the data, following the principles of constant comparison, was used to generate themes that indicate how gender inequalities are shaped in this tobacco farming region.

6.3 Results

This study explored what gender-based impacts are associated with tobacco growing in Western Province, Zambia and how these are mediated. Of the 16,500 farmers registered by the offices of the district agricultural officer under the Farmer Input Subsidy Programme (FISP), as many as 80 percent are said to also grow tobacco. Across multiple farming seasons, many farmers switch in and out of tobacco growing but on average, tobacco growers have been growing for six to seven years or more. Study findings show that large cash pay outs from tobacco growing interact with culturally mediated differences between men and women in areas such as education, access to economic resources, and intra-household decision-making. This interaction has resulted in adverse

social and health outcomes for women, indicated by continued limitations on women's autonomy, poorer nutritional indicators, and social conditions that exacerbate gender-based violence.

6.3.1 Women's productive autonomy is impacted by household cooperation norms

Women and men commonly speak about working together to grow and sell the tobacco crop; however, women have much less influence over the choice to grow tobacco or in how the income earned from tobacco growing is used.

Women participants in focus group discussions frequently stated that women have limited decision-making opportunity. A participant expresses this situation thus, "*We don't participate well in decision-making because men think that women are not supposed to make decisions*" (FGD WR-6). Too often, women's opinions are disregarded, especially when they differ from those held by their husbands; trying to get her opinion heard is likely to engender discord in the household. Another study participant illustrates this by saying, "*To convince the husbands? I don't think so 'cause … The husbands will consider it to be like you want to overtake his responsibility …*" (P12, M, Health worker).

Furthermore, women and men have different approaches to allocating the income earned from tobacco growing. The study illustrates that women face challenges with influencing household livelihood strategies or income allocation in ways that could facilitate household food and nutrition security. For instance, concerning the management of malnutrition, a participant says that "*…we counsel them about nutrition. Now, the problem is the husbands…when you give a woman a 100 kwacha, the first thing they will think is their household food. But you give the same 100 kwacha to the man of the house, he'll probably go for a beer. So, the women don't have that power over the income at home*" (P12, M, Health worker). Thus, women may hold the knowledge

needed to address household food and nutrition insecurity but face constraints to acting on this knowledge.

A few women have attempted to mitigate these constraints by getting tobacco growing contracts of their own, even if their husbands already hold similar contracts. The stated reason for this is to ensure that she can "*…control her resources without interference from the man*" (P19, M, Community member). But this option is not available to many women. Only about five percent of contracted tobacco growers are women because historical and cultural limitations affect women's access to land so, most women are unable to meet industry criteria to have the land and resources needed to hire farm workers.

In recognition of the challenges with access to livelihood assets that women farmers face, Zambia's Farmer Input Subsidy Programme (FISP) has attempted to ensure that women farmers have priority access to fertilizers and seeds. FISP does not provide these inputs to tobacco growers, but it was reported that because of household co-operation norms, "*men are using the women to access the inputs and then use them* [the inputs] *for themselves* [men]" (P2, M, Agricultural officer). In this way, fertilizers may be diverted to tobacco fields.

Therefore, in this setting, the norm of 'working together' which implies equal say between women and men is not carried through when considering other household behaviours such as providing household food and allocating income. Rather than accord women with sufficient productive autonomy, this norm limits women's production assets and capacity to tobacco growing, a livelihood strategy that men have greater say over.

6.3.2 Gender-based perceptions about household food insecurity differ

In interviews with study participants, both women and men recognize the challenge of food insecurity; accordingly, there are similarities in how men and women respond to the problem. In

this population, household food stores last for a mean duration of four months [the mode is two months] and all participants referred to the phenomenon of 'hungry months' – the period ranging between November and March each year when crops are in the field and previous harvest stores have run out. In this period, both women and men take on additional work to earn income. Usually, women combine farm work with petty trading in fruits and vegetables which may be harvested from backyard gardens but more often purchased from other vendors. Also, women may hire themselves out as workers on larger tobacco farms in the area, as domestic servants, or they may take in laundry for people who work in salaried employment. Men often go hunting or travel further west to the Zambezi floodplains for fishing.

In responding to questions about the challenges with food insecurity especially in the hungry months, men tended to simply describe how food insecurity occurs, referring to producing insufficient quantities of food or saying things like "*during December to January, we sell our tobacco at a low price; this is the reason that makes us suffer more*" (FGD MR-5). In contrast, women tended to use more evocative language to describe their adverse experiences. A woman participant says, "*Most of our time is wasted on looking for food*." (FGD WR-3).

The survey that contributed quantitative data for this study posed three questions to assess gender-based responsibility for household food access: (i) who provides (grow/buy) food; (ii) who cooks food, and (iii) who ensures food access when supplies run low. Whereas there was almost unanimous agreement that women are responsible for cooking household meals (see Table 7a), there was less convergence on the other two questions.

The data in Table 7a shows that 49% of participants responded that the man bears responsibility for providing food in households [growing the staple food on household farms or purchasing food from local markets]; in contrast 33% of participants answer that the woman bears

this responsibility. Furthermore, a similar proportion (~ 41%) allocate the responsibility for ensuring the household has food when supplies are low to either the man or the women. A much smaller proportion perceives this responsibility to be shared by both men and women.

Table 7a

Respondents' perceptions of responsibility for providing household food

	Proportion of participants (%)		
	Man	Woman	Both
In this household, who provides the food (farms and/or buys)?	49.1	33.2	14.3
In this household, who cooks the food?	7.2	89.3	2.3
In this household, if there is no food, who must make sure (or is responsible) that there is food to eat?	41.4	41.2	15.9

Table 7b

Respondents' perceptions of responsibility for providing household food, disaggregated by sex

In this household, who provides the food (farms and/or buys)?

		Man		Woman		Both		Total	
		N	%	N	%	N	%	N	%
Sex of respondent	Male	128	66.7	14	10.8	25	44.6	167	44.2
	Female	64	33.3	116	89.2	31	55.4	211	55.8
Total		192	100.0	130	100.0	56	100.0	378	100.0

In this household, if there is no food, who must make sure (or is responsible) that there is food to eat?

		Man		Woman		Both		Total	
		N	%	N	%	N	%	N	%
Sex of respondent	Male	114	70.4	24	14.9	31	50.0	169	43.9
	Female	48	29.6	137	85.1	31	50.0	216	56.1
Total		162	100.0	161	100.0	62	100.0	385	100.0

When the responses to the questions in Table 7a are disaggregated by sex, a greater proportion of women participants indicate that women, more than men, are responsible for farming or buying household food or ensuring household access to food when supplies run low (see Table 7b). Similarly, the proportion of women respondents who indicate that both men and women bear responsibility increases. Considering the greater number of male respondents compared to female respondents in this study, it appears that men may interpret their roles as household heads as including responsibility for household food access but the data in Table 7b suggests that women have more lived experience with this responsibility.

6.3.3 Women eat less than other household members

Interview accounts indicate that tobacco growing has indirect effects on the health of women. An interview participant said, "*people who are growing tobacco usually don't dwell much on food for consumption…their focus is just tobacco…so, that usually affects their families' health*" (P7, F, Health worker). To some extent, the data in Table 3 illuminates how women's health is affected.

An interview participant reports that, "*…traditionally, when we go under initiation ceremonies, … a woman is told that [she is] supposed to fend for the family. Those are traditional gender roles; as a woman, you're supposed to go to the farm, take care of the house, take care of the children …*" (P15, F, NGO worker). The quote illustrates the widely held approach to acculturate women from an early age to attend to the well-being of the entire household.

In responding to this obligation, women are likely to adopt practices that compromise their own nutrition when household food is in short supply and consequently, they end up undernourished. An interview participant reports that whereas undernourishment is common in the area, women are more affected, saying that, "*I think mostly it's 40 – 60% more women than men that are underweight, low body weight for age or for height… with low BMI*." (P12, M, Health

worker). Table 3 shows that this is likely because of men and children getting served larger food portions at mealtimes, probably in response to the requirement to 'fend for the family'.

Table 8

Food portions at mealtimes

	During mealtimes, who gets the most food?				
	N	%		N	%
Man	158	40.4	Children	98	25.1
Woman	34	8.7	Elderly	37	9.5
Workers	5	1.3	Grandchildren	53	13.6

Interviews conducted during this study also indicated that tobacco farming households are required to hire three workers per half hectare of farmland where tobacco is grown. Even though many households were unable to hire such workers, where they are hired, these workers are usually men and households prioritize feeding them to ensure that they are strong enough for the tasks required.

The data in Table 3 also indicates an interesting finding related to household structures in the area. Tobacco growing is so labour intensive that many children are left with their grandparents while their parents live in farm huts, far away from basic amenities. Thus, grandparents may be found to be primary caregivers to young children but may also lack enough resources to ensure such children are well nourished or receive health care on time if there is an illness. P7 (F, Health worker) describes it thus:

> "Though what we've seen is people who are growing tobacco, they usually don't dwell much on food for consumption. Their focus is just tobacco. So now that usually affects their families in terms of health…we've seen some children suffering from malnutrition, suffering from malaria and dying just in the community because parents are focused too much on tobacco … They are not caring for the children to say, "*OK, my child is sick, let*

me take them [to the health facility]." For them, they just think, "*oh, I'm doing tobacco, I should harvest so much*." "

6.3.4 "Women are the most vulnerable people in this area!"

In this context of prioritizing tobacco growing as the household livelihood strategy and low women's autonomy, adolescent girls are often pushed into early sexual initiation and marriages. Consequent outcomes include high rates of teenage pregnancy, maternal mortality, and sexually transmitted infections.

(a) Early sexual initiation, early marriage, and transactional sex

Poverty and food insecurity function as push factors to drive the marriage of adolescent girls to tobacco growers. Interview accounts establish that tobacco growers sell their harvests for large lump sum payments received around July to August each year and, for a couple of months after, male tobacco growers are observed to spend lavishly on drinking, expensive non-food personal goods, and on marrying new wives. It was reported that many of these new wives are recently 'matured' adolescent girls.

Multiple interview participants described maturation ceremonies that adolescent girls undergo. When adolescent girls attain puberty, their families initiate them into womanhood by holding a maturation ceremony. To announce these maturation initiations for adolescent daughters who have 'come of age', families hoist a flag in their compound. At these ceremonies, the girls are "*taught about marriage and just after the ceremony, she's told she has to sleep with a man*" (P7, F, Health worker). Even though the ceremony signals the girl is ready for marriage, this sexual initiation does not have to culminate in a marriage.

Notwithstanding advocacy against the practice of early marriage, interview participants assert that it is a prevailing cultural norm to enact these maturation ceremonies and soon thereafter,

marriages for adolescent girls. One participant says, "*We are talking in terms of 10 - 13. If they come into puberty, the next thing is they are talking of marrying them off. And lately, you find at 10, someone is in puberty and they want to marry them off*" (P3, M, Agricultural officer). Because the timing of these ceremonies coincides with the period when tobacco growers have received their payments from tobacco leaf buyers, tobacco growers are preferred as desirable sexual partners or husbands for these adolescent girls.

Furthermore, interview accounts also indicate that this practice is shaped by poverty and household food insecurity, expressed thus; "*…Also, we are experiencing early marriages, teenage pregnancies and this is happening because of poverty, because they've got no food at home. When somebody has got no food, what does he or she do?*" (P8, M, Traditional ruler). Another participant says, "*They're pushing their girl children to early marriages just because they're failing to provide food for their families, just because parents are unable to provide school fees for them*" (P15, F, NGO worker).

In addition to these early sexual encounters and marriages, participants also indicated that transactional sexual encounters with tobacco migrant workers are common in Nkeyema and Kaoma during the entire tobacco growing season. These incidences increase during the tobacco marketing period, when tobacco growers and other workers associated with the tobacco industry converge on the premises of Japan tobacco international (JTI) – the largest provider of tobacco grower contracts in these districts. It was said that "…*you'll see a lot of girls just going there* [JTI] *with the truck drivers. This is the period that these farmers have money so, it's just like they are free to get every woman that they like*," (P7, F, Health worker). These behaviours are also said to be associated with high prevalence of HIV and other sexually transmitted infections as P7 adds, "*you know, we've got a lot of STIs as a district.*"

(b) Early pregnancies and high maternal mortality

National level data indicates that rural-dwelling young women between 15-19 years old are two times more likely to have started childbearing than their counterparts in urban areas [37% versus 19%] (ZSA et al., 2019). Nkeyema and Kaoma are largely rural districts and where early pregnancy is undoubtedly connected to the maturation ceremonies described in the preceding section. Protective measures may not be used during sexual intercourse at the time of maturation ceremonies resulting in adolescent girls "*getting pregnant or getting HIV just through the traditional ceremony*" (P7, F, Health worker).

However, the attainment of puberty is not synchronous with physical readiness for childbearing so, it is reported that "*we also find much maternal death just because of the complications young girls pass through during delivery*" (P15, F, NGO worker).

Given that sexual initiation during these ceremonies is not required to result in a marriage, these pregnancies may be among adolescent girls who are unmarried, "*…so, we have a lot of single mothers*" (P4, M, Agricultural officer). This will in turn increase the constraints these girls face, for instance, regarding completing their education and attaining the improved status associated with higher levels of education.

(c) Abandonment and neglect

In addition to the foregoing, interview participants alluded to several other forms of gender-based violence observed to relate to the spending behaviours of tobacco growers. Polygamy is rare in this area, but it is common to find mothers raising children alone related to a high rate of divorce or abandonment of wives, neglect, and domestic violence reportedly prevalent among tobacco farmers who easily abandon their former wives to marry new women.

It was said that this happens because former wives have grown ‘unattractive’ due to farm toil and these men can afford to marry younger, more attractive wives. The divorced or abandoned wife is left to fend for herself and any children or other dependents that she might have. Such issues are commonly reported to community chiefs for resolution however, the practice remains. One chief concluded thus:

> “I found a man married to four women. Do you know what he is doing? He's not supporting them with necessities as a man is supposed to. The women are fending for themselves! When they heard that the senior nduna [executive advisor to the Chief] has come, they came to complain. I'm telling you; women are the most vulnerable people in this area! Men use them and, in the end, they get nothing.” (P8, M, Traditional leader).

6.4 Discussion and Conclusion

> “When girls are valued less than boys, women less than men, they face multiple risks throughout their lives –. Gender-based violence is a major consequence of gender inequality.”
>
> - Bukky Shonibare.

In Nkeyema and Kaoma, Western province, Zambia, this paper investigated how rural women in tobacco-growing households are empowered to exercise agency (or not), what gender inequality looks like in this setting, and where opportunities for greater empowerment exist. These findings raise important questions about how the interaction of gender norms, culture, and tobacco growing as a livelihood strategy shapes determinants of women's health and well-being. The following discussion addresses some implications of these findings.

Much has been done to raise awareness about the roles and contributions of women in economic development and many development interventions have targeted increasing structural

access to empowerment capabilities, such as education, capital, property ownership, legal protection from violence, and inclusive social structures (Rai, 2002, 2011; Razavi & Miller, 1995; Verschuur, 2014). Despite this, progress on reducing gender inequalities has remained slow and we are increasingly recognizing how the connectedness, compromises, and conflicts inherent in social relationships are interacting with gender norms to constrain progress on women's empowerment.

In the Global South, prevailing approaches to women's empowerment as a path to gender equality have emphasised interventions that address narrow issues: within the woman's domain, but beneficial to attain broader objectives within the community. We accept the normative assumption that women are responsible for care of the family, children, so development interventions address issues like family planning, nutrition, and hygiene education. Access to productive assets (land, livelihood inputs e.g. crops, livestock, seedlings, and agricultural innovations, micro-loans, and off-farm income options) and empowerment capabilities (education, healthcare) is seen as necessary for women to function as pivotal agents of change for the well-being of their households and community. These approaches come across as utilitarian and while useful, they often prevent a critical interrogation of why interventions in women's empowerment have had limited benefits or have even been disempowering (Khader, 2018).

In many regions of the world, women have been conditioned to assume responsibility for their households/families and have therefore also become conditioned into assuming their own well-being is synonymous with the family's well-being. Therefore, many women take actions consistent with this acceptance of their utility. So, while it makes sense to empower women, in practice, all the aforementioned types of interventions create a measure of empowerment, but fail

to address the structural, cultural, and normative assumptions that keep women in a particular social location.

In Zambia, laws that restrict women's rights have been overturned and there is no intentional limitation of women's rights. However, it has remained a challenge to act on Article 5(a) of CEDAW that encourages states to,

> "Modify the social and cultural patterns of conduct of men and women, with a view to achieving the elimination of prejudices and customary and all other practices which are based on the idea of … stereotyped roles for men and women."

Not all the inequalities and vulnerabilities discussed in the results section are directly attributable to tobacco-growing. For instance, early girl-child marriages are culturally influenced independent of a tobacco growing livelihood. However, the presence of "rich" tobacco growers in the community has not helped the efforts of civil society organisations that have been advocating for the cessation of this practice.

Furthermore, this study illustrates that, in tobacco growing households, the tensions, conflicts, and constraints that women face emanate from a combination of determinants. Global trade pressures to increase tobacco leaf harvests have downstream effects on household choices to seek grower contracts. These combine with the social pressure that women face to support the family so that women ostensibly "choose" to support this labour-intensive livelihood with its questionable profitability. Therefore, the value of household co-operation constitutes an unintentional normative barrier to the full realization of women's rights in this rural agricultural setting.

As a global community we implicitly affirm framing household co-operation as acceptable and desirable – women also accept it as so. Because the idea that the woman's role is to support

the family and create cohesion is so commonplace, it can easily be overlooked when this framing becomes a barrier to gender equality. Women end up co-operating in a livelihood option over which they have little influence and are unable to access the benefits that they care about: sufficient income to meet household food needs year-round, confidence that their husbands will ensure the household is provided for, and freedom from the fear of neglect and abandonment.

Various studies have established the questionable profitability of tobacco growing and, in this study, participants also expressed dissatisfaction with grower contracts that continually return less than expected returns at the end of the farming season. Therefore, scaling up investments in the value chains of other crops, specifically those of nutritious food value, would return multiple benefits. First, farmers could grow crops that are less labour intensive (freeing up labour for other tasks), and that have more food benefits (to help meet cash AND food needs with crops that have food value). Second, it would raise more possibilities for gender equality in the community because it would harness intra-household co-operation and social negotiation towards crops or livelihoods that would address the concerns that are important to women as research has shown that women have greater decision-making influence when they grow food crops. Third, it has the potential to reduce the incidences of harmful practices (like early marriage) by reducing the income inequalities that make tobacco growers more attractive to families with adolescent girls.

In conclusion, intra-household co-operation appears to be a social process by which patterns of behaviour that create and exacerbate gender inequalities are unwittingly mediated in rural agricultural communities. By remaining critically conscious of and taking this reality into account when designing development interventions, it is possible to facilitate more gender transformative growth in rural areas. Development practitioners should be intentional and deliberate in planning to talk with women, and other community members to determine how the

value of intra-household co-operation might be harnessed to yield benefits for both men and women. As previous action research in Zambia has shown, this may be challenging but it is not impossible (Frischmuth, 1995). Indeed, I argue that it is imperative.

Chapter 7

Concluding Discussion

This study aimed to determine the ways by which tobacco growing may shape food insecurity among smallholder farmers and in addition, explore what gender-based experiences and inequalities arise in this situation and how. Findings from this study extend knowledge generated by previous research on the impacts of tobacco farming in developing countries and can inform policy and development interventions to secure food and nutrition security among rural smallholder farmers, thereby helping Zambia and other African countries make meaningful progress to end hunger in fulfillment of Sustainable Development Goal 2.

To accomplish the research goal, I undertook a concurrent transformative mixed methods study conducted in Western province, Zambia and my analytical perspectives were informed by the sustainable livelihoods framework (SLF), and the gender and development (GAD) discourse. The main objectives addressed by this research were:

1. To characterize food insecurity in the context of tobacco growing in rural Zambia.
    a. This objective included determining the prevalence of food insecurity in the area and among tobacco growers as well as exploring what variables were associated with food insecurity.
2. To explore and describe the reasons why and how farmers in tobacco growing households could become food insecure.
3. To explore and describe gender inequalities in smallholder farming households, how they relate to tobacco growing and the experience of household food insecurity.

This chapter summarizes significant findings from this research and connects with existing literature on the implications of tobacco growing in sub-Saharan Africa, food insecurity and gender-based considerations in this and similar contexts. Furthermore, this chapter outlines major contributions of the research, discusses some limitations, and concludes with a discussion of policy implications of this research and directions for future study.

7.1 Summary of findings

The findings of this research are presented in three papers that comprise this dissertation and are summarized in the following section.

Given the role that smallholder farmers are acknowledged to play in food and nutrition security (Gomez et al., 2020; Lowder et al., 2021), the evidence of chronic undernourishment and worsening acute food insecurity in Western province, Zambia (Lubungu & Singogo, 2021; ZSA et al., 2019) and the scale of tobacco growing in an area crucial to food crop production in Western province, Chapter Four establishes the prevalence of food insecurity in this area based on the analysis of data from a cross-sectional survey administered to 391 smallholder farmers (Sample 1, tobacco and non-tobacco growers) and 116 smallholder tobacco growers only (Sample 2).

Given that about two and half hectares of farmland are under crop cultivation in general in the growing seasons that preceded the survey, whether they are tobacco growers or not, farming households in both samples assessed meet the criterion for defining farmers as smallholder farmers (FAO, 2013; Lowder et al., 2021). As assessed by the Household Food Insecurity (Access) Scale (Coates et al., 2007), 55 percent of smallholder farming households were found to be food insecure in Sample 1, and 19.8% of smallholder tobacco growing households in Sample 2 were food insecure.

In a linear regression model, I found more factors significantly associated with food insecurity in Sample 1 than in Sample 2 at *p* value < 0.05 and 95% confidence interval. Tobacco growing status was not found to be associated with food insecurity scale scores but in tobacco growing households, the number of months that food stores lasted was associated with food insecurity scale scores (B = -0.477, 95% CI -0.717 to -0.237). In both samples, increasing age was positively associated with higher food insecurity access scale scores indicating that the physical ability to deploy labour influences agricultural productivity.

Applying the sustainable livelihoods framework as a lens through which the findings presented in Chapter Four are critically analyzed, I argue that there is an interaction between tobacco growing and food insecurity within the context of other determinants of food insecurity such as labour use (physical assets) and agricultural land use (natural assets). These assets make important contributions to the outcomes of a sustainable livelihood, one of which is food security.

In both samples, no matter how much land they had access to (Sample 1, mean 5 hectares; Sample 2, mean 25 hectares), I found that over 50 percent of farmers left half or more of their available farmland uncultivated. When I probed why, I expected to hear it was because they left land to fallow but I learned it was because they lacked the labour and/or technology needed to cultivate more than 2.5 hectares of crops. This quantitative finding is also better appreciated when aligned with qualitative data from interviews that say tobacco production is labour demanding. For farming households that do not grow tobacco, labour use (physical asset) is also a crucial determinant as the amount of land that can be cultivated using manual labour is extremely limited. Farmers of older age are less likely than others to bring adequate amounts of land under crop cultivation.

The amount of land that farmers can use for crops is also a factor that pushes farmers into tobacco growing. Farmers alluded to the amount of money they could get per hectare of land if they grew tobacco versus if they grew maize, the only other crop with significant cash value in the area. This allusion is also better appreciated when aligned with interview data indicating that, even when they plant maize, farmers who grow tobacco concentrate more on tobacco so that their leaf harvest meets the grade expected by the tobacco industry. Thus, they spend less time on their food crops, end up with an inadequate harvest of food crops and run out within a few months of the harvest.

Allocating some of the limited labour and land that farmers have access to away from food crops to non-food cash crops like tobacco can exacerbate existing challenges with food insecurity. Mechanization would support farmers to bring more land under crop cultivation, however, such farmlands need to be allocated to food crops for there to be positive impacts on food security.

Tobacco growing has been proffered as a pathway to rural poverty reduction suggesting some communal benefits from individual smallholder farmers growing tobacco. However, while tobacco growers in this study earned more money than non-tobacco growers, this relative wealth does not appear to have spillover benefits in the area, as indicated by the low incomes and high prevalence of food insecurity in the broader population. Even tobacco growers are not invulnerable to food insecurity as almost 10 percent of tobacco growers in Sample 2 were found to be severely food insecure. In general, conditions that restrict the quantity of land that can be used for growing food crops and for storing food crop harvests will make smallholder farmers more vulnerable to food insecurity.

In Chapter Five, I use quantitative data from two cross-sectional surveys (N=159 tobacco growers) and qualitative data from interviews and focus group discussions with a total of 57 participants to analyze why tobacco growers may be food insecure.

Though quantitative data indicates that tobacco growers are more food secure than not, it also established that there is a significant degree of food insecurity among tobacco growers, and this belies the narrative of prosperity in tobacco growing. In addition to the labor-intensive aspect of tobacco growing highlighted above, incomes earned from tobacco growing do not appear to be applied to expand food crop production or off-farm businesses.

Pervasive poverty is observed in the area despite participants alluding to tobacco growing being responsible for development progress in the area. Many farmers in the sample have grown tobacco for five years or less so, current tobacco growers may not have historically grown tobacco, whereas former tobacco growers may have discontinued due to age or other factors. This suggests that farmers switch in and out of tobacco growing over time and if claims of profitability hold true, one could expect to see (i) relative prosperity in the area and, (ii) farmers with more years in tobacco growing. However, what is observed is the absence of basic infrastructure that facilitates access to secondary education and health care, for instance. Qualitative data sheds some light on the factors that shape persisting poverty and related food insecurity outcomes in the area.

Farmers in this tobacco growing area in rural, sub-Saharan Africa acknowledge that tobacco is a non-food investment but continued growing of this crop appears to make the most economic sense given other factors of production affecting agricultural enterprise. The ready access to farming inputs provided by the tobacco industry operates at the micro-level of farmers' livelihoods, harnessing their human capital and natural assets (labour, farmland, forests) and providing complementing financial and physical assets (credit, seeds, fertilizer, access to market).

By giving the impression that the elements needed for a secure livelihood are in place (Scoones, 1998, 2009), the tobacco industry masks the fact that broader processes necessary for sustainable livelihoods are inaccessible to contract tobacco growers. The disparity in power is apparent when smallholder tobacco growers are dealing with multinational tobacco corporations. These growers are unable to influence the tobacco grading and pricing process nor are they able to influence the price of tobacco in the global marketplace. This situation leaves farmers at the mercy of power imbalances with the private sector and global trade, and vulnerable to external shocks that eventually impact on the adequacy of income from tobacco growing. Tobacco growers explained that their incomes are low in comparison to the amount of labour they put into tobacco growing and relative to income levels projected at the time of signing out-grower contracts. In this manual, rain-fed agricultural system, the timing for tobacco growing and food crop production overlap so the labour allocated to tobacco growing is lost to food production. And, among food insecure tobacco growing households, the income earned is insufficient to replace lost own food production capacity. The persistence of this problem also suggests that considerable changes are necessary to reverse current patterns.

Women and men share tobacco growing labour in Africa (Hu & Lee, 2016) but influence over decision-making about household allocation of labour and incomes is unequal. Study findings show that patriarchal norms and customs interact with intra-household co-operation norms to influence how household labour is allocated to agricultural activities, and incomes to food and non-food needs (Anderson et al., 2017; Shibata et al., 2020). As a result, women are unable to take steps to mitigate household food insecurity. Interventions that aim to reduce household food insecurity, for example by increasing agricultural output or promoting small businesses among

women but fail to address the constraints women experience because of interacting cultural norms and intra-household bargaining will have little success and will likely add to women's burdens.

In Chapter Six, I draw on survey and interview data to further describe other gender-based inequalities and vulnerabilities observed and reported on in the context of tobacco growing. Zambia's attempts to protect women's economic rights align with global initiatives thus, Zambia is one of the few African nations where women in formal work are at par with men in terms of labour force participation and salaries (WEF, 2021). The picture for rural women is vastly different, due to far less effort to address the complexities that affect the economic and social rights of rural women, such as the links between law, context, and custom. In Africa, framing access to women's rights in relation to their reproductive roles in childbearing and childcare facilitates buy-in from a broad range of stakeholders across multiple levels of political and economic organization. However, it is a paternalistic approach that interacts with deeply entrenched customs, norms and attitudes to place limits to the expansion of women's rights, opportunities, and empowerment (Banks, 2009; Marcus, 2018).

Though up to 80 percent of farmers in the area are said to also grow tobacco, only five percent of registered contract smallholder tobacco growers are women meaning that the large monetary payouts from the tobacco industry end up under the control of men. This combines with culturally mediated inequalities between men and women in access to education, other economic resources, and intra-household decision-making to limit women's empowerment. Women have suffered negative social and health consequences as a result of this interaction, as evidenced by persistent restrictions on their autonomy, poorer nutritional status, and the persistence of cultural and social processes that increase the risk of gender-based violence.

Finding that household conflicts arise because women have far less influence over the choice to plant tobacco and how the money obtained from tobacco growing is distributed despite cooperating with men to grow the crop is corroborated by recent studies (Prowse, 2022). Finding that women have less influence also aligns with a critique of the development discourse that, without an explicit gender-sensitive lens, we fail to take into account the fact that development outcomes often unevenly favor more dominant sub-populations over others (Everett & Charlton, 2014). Another interesting finding connected with norms of household co-operation was that women beneficiaries of the FISP program would collect their seed and fertilizer inputs but give these over to men for use on their farms. This finding has several implications for considering how development interventions intended to facilitate women's empowerment intersect with cultural and social norms, in this case, norms around intra-household co-operation.

Dominant community narratives also advance a value for intra-household co-operation in ensuring household food access but sex-disaggregated quantitative data shows women as having greater lived experience with this responsibility. To cope with food insecurity, women eat last and possibly the smallest amount resulting in poorer nutritional status among women.

I also learned that early sexual initiation and marriage is associated with food insecurity. Due to the perceived financial security that comes with the livelihood, tobacco growers are considered desirable marriage partners when families are marrying off girls as young as 10 – 13 years old. Participants also described neglect, abandonment, and divorce as experiences that women in tobacco-growing households are at risk of.

Many development interventions have focused on increasing structural access to empowerment capabilities [education, capital/credit, property ownership, legal protection from violence], and inclusive social structures in order to facilitate women's empowerment (Rai, 2002,

2011; Razavi & Miller, 1995; Verschuur, 2014; Visvanathan et al., 2011) Despite this, progress on reducing gender inequalities has been modest, and we are increasingly realizing how the interconnectedness, compromises, and conflicts inherent in social interactions intersect with gender norms to stymie women's empowerment.

7.2 Contributions

The research makes academic and applied contributions. It is the first study to explore and describe how tobacco growing affects food insecurity in Western Zambia. While the province has been the focus of attention due to recent experiences with worsening acute food insecurity, assessments have yet to explore the social processes occurring in the most significant food producing area of Western province. This area is also the epicenter of tobacco growing in the province and attracts migrant workers from other districts of the province, indirectly contributing to livelihoods in other districts where workers come from. This study illustrates how social phenomena can operate at multiple scales – global, national and international, subnational, local and at household level. To understand complex problems like food (in)security, its interactions with gender, and the determinants of food (in)security, we must consider these multiple scales.

7.2.1 Scholarly contributions

This research draws on multiple decades of food security research led by the Food and Agricultural Organisation that necessarily has a global focus and other existing literature on sustainable livelihoods, food systems, and food security that make varied contributions to understanding the determinants of food insecurity. In documenting the challenges unique to local contexts such as the tobacco growing region of Zambia's Western Province, this research extends the existing body of knowledge. It confirms our understanding that poverty is the primary driver of food insecurity but adds to this by illustrating that drivers of poverty in the research setting are also connected to

enacted livelihoods strategies. An important and non-negotiable outcome of a sustainable livelihood is food security but tobacco growing is limited in fulfilling this outcome.

Private sector and global trade influences in tobacco growing brings this livelihood option under the influence of neoliberal market systems that distribute profit to the more powerful. In this system, the industry co-opts smallholder land and labour into its profitable enterprise but fails to deliver meaningful profit to farmers or opportunities for growth/diversification into alternative livelihoods. Tobacco growers must concentrate their labour on this endeavour or opt-out of it. As it appears that the income benefits of tobacco growing cannot be sustained by tobacco growers nor extended to other members of the community, this livelihood option falls short of the criteria for sustainable livelihoods widely accepted in the Sustainable Livelihoods Framework (SLF).

Additionally, this research shows that tobacco growing interacts with pre-existing inequalities and discriminatory norms to perpetuate gender-based inequalities (Gilmore et al., 2015; Leppan et al., 2014; Marcus, 2018). More concerning is how tobacco growers are the beneficiaries of customs and practices that predispose women and girls to gender-based violence. By describing the constraints to women's empowerment and gender equality found in this setting, this research provides more evidence on the social disruptions caused by tobacco farming and is the first substantive contribution on this issue in at least a decade.

7.2.2 Policy implications

The findings of this research have practical application to diverse but connected policy spaces in local agricultural development and tobacco control locally in Zambia and regionally in the South African Development Community (SADC). By engaging stakeholders connected with the health, agriculture, and environment ministries, Zambia can develop policies with practical relevance for a food secure yet economically viable future for rural agricultural economies. Finding that tobacco

growing results in unintended consequences of entrapment in debt, poverty, as well as hunger and food insecurity in the short term, and environmental degradation in the long term should motivate stakeholders to more actively generate alternative livelihoods to tobacco growing.

Food insecurity is not simply about low access to food, it is a challenge shaped by complex, intertwined drivers operating at multiple scales so, communities or countries such as Zambia that struggle with this challenge need to make significant, sustained investments in supporting farmers to profitably engage in markets. An important objective would be the strengthening of markets for a variety of food crops. In Zambia, smallholder farmers tend grow cash crops like tobacco for income and then grow maize for household consumption but other food crops like rice, cassava, millet, sweet potatoes, pulses, and vegetables have far lower uptake among smallholder farmers resulting in low food diversity. This is turn increases vulnerability to food and nutrition insecurity. Allowing gaps with access to agricultural inputs to be filled by the tobacco industry continues to enable tobacco growing, risks the ecosystem resources that support food production and contributes to a framework of social determinants of poor health outcomes such as malnutrition, stunting in children and anemia in women of reproductive age.

Policy opportunities exist to improve access to factors of production such as credit, technology, seeds, and fertilizers. This will expand farmers' capacity to increase the amount of land that they may bring under crop cultivation, improve agricultural productivity in general, and food production in a more specific sense. While Zambia continues its investments in agriculture and food sufficiency, it could also utilize the evidence provided in this research to consider new ways to create gender transformative opportunities in agricultural livelihoods.

Transformative policy interventions must realize several objectives. These will include raising incentives for farmers to grow food crops by strengthening or re-designing existing national

programs of support for rural, smallholder farmers to ensure that they meet intended purposes. Farmers have come to rely on programs such as the Farmer Input Subsidy Program (FISP) but participants in the present study corroborate the findings of other studies that highlighted the weaknesses of FISP (Mason & Tembo, 2015b). One major complaint participants levelled against FISP was that the support provided was insufficient to enable farmers scale production, grow their agri-businesses and exit the FISP roster. Additional process and impact evaluations of FISP will help to uncover leverage points for strengthening FISP, including preventing the hijacking of FISP benefits by better connected farmers or the diversion of FISP inputs from women smallholder farmers to other people or purposes.

Another opportunity for policy intervention exists with expanding crop diversity. Zambia's smallholder farmers produce sufficient maize to meet the country's maize supply if appropriate storage and distribution mechanisms are in place. However, food security addresses more than access to staple food. Nutrition security also must remain an important national priority and so, lessons learned from the USAID supported Scaling Up Nutrition Program, and previous nutrition support programs funded by Caritas and Concern Worldwide should be deployed across rural districts of Zambia. These will help to ensure that Zambians develop a local food system that prioritizes nutritious food, increases access to such food for Zambia's short- and long-term development.

7.3 Study limitations

The important contributions of this research notwithstanding, there are a few limitations. These present opportunities for future research on food insecurity in general and related impacts on vulnerable populations.

First, this research was conducted using a mixed methods study design. The quantitative strand was observational which limits opportunities for determining causal links between tobacco growing and food insecurity. Historically, and as attested to by participants, tobacco growers received very poor returns for their investment. It was reported that in the year preceding this study, the Government of Zambia had enacted legislation to ensure that tobacco growers got fairer deals with the tobacco industry. It was suggested that this resulted in large incomes for tobacco growers in the year under review and may account for the wide disparity in median incomes recorded in this study. However, a longitudinal study design would support rigorous comparison of incomes over time, allowing researchers arrive at a clearer understanding of the association between tobacco growing, the stability of farmers' incomes in this enterprise and related health outcomes.

Second, during interviews and focus group discussions, participants consistently referred to their concern about the high levels of deforestation caused by wood burning for tobacco curing. They expressed worry about what this would mean for the long-term wellbeing of the community. It was beyond the scope of this research to estimate how much forest timber was being lost but future studies can estimate forest loss, and related well-being consequences. Findings from such research could help policy makers better understand the diverse risks and adverse consequences associated with tobacco growing.

Third, navigating research spaces, tools and contexts during a pandemic limited the depth of observations and conversations that could have contributed to extending our understanding of how gender equality could be facilitated through transformative dialogues, as well as policy and development interventions.

Future opportunities for research and action include determining how smallholder farmers are selected or self-select into tobacco growing. If producing tobacco draws farmers who already have the land and labour resources necessary to produce food crops profitably, it is vital to determine whether this choice is solely influenced by the availability of ready cash. How would this work to persuade smallholder farmers to migrate out of tobacco farming permanently if the Zambian government and other development partners created programmes that matched or exceeded the structural and financial support offered by the tobacco industry?

7.4 Concluding statements

More people worldwide suffer from disease due to poor nutrition than from drug, alcohol, and tobacco use combined. Health is essential for sustainable development and is influenced by food and nutrition security. What food crops are valued, how they are grown, marketed, and assimilated into local diets depends on several factors which ultimately affect dietary choices, diet quality and have a significant impact on health.

In markets shaped by neo-liberal economic principles, food and nutrition security rarely drive how local food systems are shaped. More specifically, market demands affect what farmers opt to grow and it is important to consider the processes that incentivise or challenge the production and distribution of nutritious foods, especially in rural areas.

Countries have renewed their commitment to fighting poverty, hunger, and malnutrition with the adoption of the new 2030 Agenda for Sustainable Development, recognising that equitable and sustainable growth, as well as inclusive structural transformation, are critical to achieving sustainable development and lifting people out of poverty. The 2030 Agenda provides us with an opportunity to direct governmental and corporate efforts toward reaching the poorest of the poor, particularly in developing-world rural areas. This endeavour will not be easy, and it will

necessitate a shift in how we think and act about rural development. Today's investments must consider natural resource conservation and sustainable agriculture production, as well as climate smart technologies (FAO, 2017).

When countries like Zambia consider how to reduce poverty in rural sub-Saharan Africa, the viability of livelihoods must address broader issues than profitability. Food insecurity is more than food or income access. Arguments focused on income are too narrow to facilitate a fulsome assessment of outcomes of livelihood options. Ongoing challenges with food insecurity in Africa are shaped by processes that operate at multiple scales, intersecting across the household, local, regional, national and international levels and with institutions that function at these different scales. Additionally, agricultural communities are producers of the world's food supply, and in such communities, small holder farmers produce eighty percent of available food. It ill-serves local communities and local food systems for farmers efforts to be diverted to crops that have no food value. The apparent short-term profitability of crops such as tobacco is an untenable argument for investing in them. Smallholder farmers should be protected from diverting their land and labour to production efforts designed to serve only the interests of the global marketplace while neglecting adverse impacts on local food systems. In addition to short run consequences discussed in this dissertation, longer term consequences of tobacco growing include the depletion of ecosystem resources that help smallholder farmers maintain food production capacity. Furthermore, as has also been discussed, most smallholder tobacco growers are unable to translate the incomes earned each year to develop viable agri-livelihoods in food crop production.

Zambia, and similar sub-Saharan African countries cannot ignore their obligations to fulfill obligations demanded by the WHO Framework Convention on Tobacco Control (WHO FCTC) on the assumption that tobacco growing does not have health implications for its people. Not only

is tobacco consumption higher among tobacco growers relative to other sub-populations in rural, agricultural communities (Cai et al., 2012), but undernutrition as one health implication of lost food production capacity is also evident. Other social behavioural consequences discussed in this dissertation also have health implications. High incidences of sexually transmitted infections, malnutrition among women and children and gender-based violence are contributors to poor health outcomes among the rural poor, and particularly among women.

Food insecurity is not simply about food or the lack of it. It is also about gender, markets, and power interactions. It also has broader health consequences than malnutrition – issues like child marriage, sexual behaviour and wife abandonment are also shaped by food insecurity. Interventions that appear functional and/or transformative at one level e.g. national programmes designed for women in smallholder farming households or tobacco contracts may not be producing projected results. The metrics often used to define and quantify food insecurity only illustrate a small part of the picture. There is need for more sensitive, multiscale, and multifaceted research and intervention.

References

References in Chapter 1

Akhter, F., Buckles, D., & Tito, R. H. (2014). Breaking the dependency on tobacco production: Transition Strategies for Bangladesh. In W. Leppan, N. Lecours, & D. Buckles (Eds.), *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press, International Development Research Centre.

Central Statistical Office, CSO. (2016). *2015 Living Conditions Monitoring Survey Report*. www.zamstats.gov.zm

Central Statistical Office, CSO. (2018). *Zambia in figures 2018*. www.zamstats.gov.zm

Chikowo, R. (n.d.). *Zambia - Global yield gap atlas*. Retrieved August 18, 2022, from https://www.yieldgap.org/zambia

Centre for Tobacco Control in Africa, CTCA. (2013). *Factsheet on Alternative Livelihoods to tobacco farming in Africa*. https://ctc-africa.org/images/docments/factsheets/ALFACTSHEET.pdf

FAO, IFAD, UNICEF, WFP, & WHO. (2018). *The State of Food Security and Nutrition in the World 2018: Building climate resilience for food security and nutrition.* www.fao.org/publications

Integrated Food Insecurity Phase Classification, IPC. (2021). *Zambia IPC Acute Food Insecurity Analysis*. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155081/?iso3=ZMB

Khisa, G. V. (2019). Tobacco Growing Condemning Tobacco Farmers to Poverty in Malakisi, Bumula Sub-County. *The Journal of Agriculture and Natural Resources Sciences*, *6*(1), 1–14.

Lubungu, M., & Singogo, F. K. (2021). *2021 Zambia Food Security and Nutrition Report*.

Lusaka Times. (2022). *Zambia: The Basic Needs and Nutrition Basket Continues to Rise- JCTR*. https://www.lusakatimes.com/2022/08/15/the-basic-needs-and-nutrition-basket-continues-to-rise-jctr/

Mubanga, K. H., & Ferguson, W. (2017). Threats to food sufficiency among smallholder farmers in Choma, Zambia. *Food Security*, *9*(4), 745–758. https://doi.org/10.1007/s12571-017-0700-4

O'Neill. A.O. (2022, February 15). • *Zambia - share of economic sectors in the gross domestic product 2010-2020 | Statista*. Statista: Economy and Politica. https://www.statista.com/statistics/457737/share-of-economic-sectors-in-the-gdp-in-zambia/

Ramos, A. K. (2018). Child Labor in Global Tobacco Production: A Human Rights Approach to an Enduring Dilemma. *Health and Human Rights*, *20*(2), 235–248. https://doi.org/http://resolver.scholarsportal.info/resolve/10790969/v20i0002/235_cligtp

Zambia Statistics Agency, ZSA. (2020). *2020 Labour Force Survey Report*. www.zamstats.gov.zm

Zambia Statistics Agency, Ministry of Health (MOH) Zambia, and ICF. 2019. Zambia Demographic and Health Survey 2018. Lusaka, Zambia, and Rockville, Maryland, USA: Zambia Statistics Agency, Ministry of Health, and ICF. Retrieved from https://www.dhsprogram.com/pubs/pdf/FR361/FR361.pdf

References in Chapter 2

Akhter, F., Buckles, D., & Tito, R. H. (2014). Breaking the dependency on tobacco production: Transition Strategies for Bangladesh. In W. Leppan, N. Lecours, & D. Buckles (Eds.), *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press, International Development Research Centre.

Arcury, T. A., & Quandt, S. A. (2006). Health and social impacts of tobacco production. *Journal of Agromedicine, 11*(3–4), 71–81. https://doi.org/10.1300/J096v11n03_08

Arcury, T. A., Quandt, S. A., & Preisser, J. S. (2001). Predictors of incidence and prevalence of green tobacco sickness among Latino farmworkers in North Carolina, USA. *Journal of Epidemiology and Community Health*, *55*(11), 818–824. https://doi.org/10.1136/JECH.55.11.818

Babalola, A. S. (1988). Tobacco farming and women in rural community of Nigeria. *African Notes, No. 3*, 39–44.

Babalola, S. O., & Dennis, C. (1988). Returns to women's labour in cash crop production: tobacco in Igboho, Oyo State, Nigeria. In *Agriculture, women and the land: the African experience.* (pp. 79–89). Westview Press.

Bacon, C. M., Sundstrom, W. A., Flores Gómez, M. E., Ernesto Méndez, V., Santos, R., Goldoftas, B., & Dougherty, I. (2014). Explaining the 'hungry farmer paradox': Smallholders and fair trade cooperatives navigate seasonality and change in Nicaragua's corn and coffee markets. *Global Environmental Change*, *25*(1), 133–149. https://doi.org/10.1016/J.GLOENVCHA.2014.02.005

Baro, M., & Deubel, T. F. (2006). Persistent Hunger: Perspectives on Vulnerability, Famine, and Food Security in Sub-Saharan Africa. *Annual Review of Anthropology*, *35*, 521–538.

https://doi.org/10.1146/annurev.anthro.35.081705.123224

Bennett, E. P. (2008). Manning the fields: Remaking women's work in the tobacco South in the twentieth century. *Journal of Peasant Studies*, *35*(4), 720–741. https://doi.org/10.1080/03066150802682011

Carr, E. R. (2008). Men's Crops and Women's Crops: The Importance of Gender to the Understanding of Agricultural and Development Outcomes in Ghana's Central Region. *World Development*, *36*(5), 900–915. https://doi.org/10.1016/j.worlddev.2007.05.009

Committee on World Food Security (CFS). (2014). *Global Strategic Framework for Food Security & Nutrition (GSF)*. Retrieved from https://www.fao.org/cfs/policy-products/onlinegsf

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3).* http://www.fao.org/fileadmin/user_upload/eufao-fsi4dm/doc-training/hfias.pdf

Coburn, C., Restivo, M., & Shandra, J. M. (2015). The African Development Bank and women's health: A cross-national analysis of structural adjustment and maternal mortality. *Social Science Research, 51*, 307–321. https://doi.org/10.1016/j.ssresearch.2014.09.007

Centre for Tobacco Control in Africa, CTCA. (2013). *Factsheet on Alternative Livelihoods to tobacco farming in Africa*. https://ctc-africa.org/images/docments/factsheets/ALFACTSHEET.pdf

Drammeh, W., Hamid, N. A., & Rohana, A. J. (2019). Determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa: A review of the literature. *Current Research in Nutrition and Food Science*, *7*(3), 610–623. https://doi.org/10.12944/CRNFSJ.7.3.02

Drope, J., Schluger, N. W., Cahn, Z., Drope, J., Hamill, S., Islami, F., Liber, A., Nargis, N., & Stoklosa, M. (Eds.). (2018). *The Tobacco Atlas* (6th ed.). American Cancer Society and Vital Strategies. www.tobaccoatlas.org

Dudek, H., & Myszkowska-Ryciak, J. (2020). The Prevalence and Socio-Demographic Correlates of Food Insecurity in Poland. *International Journal of Environmental Research and Public Health*, *17*. https://doi.org/10.3390/ijerph17176221

Ellis, F. (1998). Household strategies and rural livelihood diversification. *The Journal of Development Studies*, *35*(1), 1–38. https://doi.org/doi:10.1080/00220389808422553

Ellis, F., & Freeman, H. A. (2004). Rural Livelihoods and Poverty Reduction Strategies in Four African Countries. *The Journal of Development Studies*, *40*(4), 1–30. https://doi.org/10.1080/00220380410001673175

Everett, J. M., & Charlton, S. E. M. (2014). *Women navigating globalization: Feminist approaches to development*. Rowman & Littlefield.

FAO, IFAD, UNICEF, WFP. and WHO. (2021). *Food Security and Nutrition in the World Security , Improved Nutrition and Affordable Healthy Diets for All*. https://doi.org/https://doi.org/10.4060/cb4474en

Food and Agriculture Organisation, FAO. (2021). *FAOSTAT: Data: Production, crops. Zambia*. https://www.fao.org/faostat/en/#data/TCL

Fiona, A., & Mackenzie, D. (1999). Betterment and the Gendered Politics of Maize Production , Murang'a District, Central Province, Kenya, 1880-1952. *Canadian Journal of African Studies*, *33*(1), 64–97.

Goma, F., Drope, J., Zulu, M. R., Li, M. Q., Chelwa, G., Labonté, R., & Banda, M. J. (2017). *The economics of tobacco farming in Zambia*. https://www.cancer.org/content/dam/cancer-

org/research/economic-and-healthy-policy/economics-tobacco-farming-zambia-2017.pdf

Greaves, L., Jategaonkar, N., & Sanchez, S. (2006). *Turning a new leaf: Women, tobacco, and the future* (Vol. 1). British Columbia Centre of Excellence for Women's Health. https://doi.org/10.1017/CBO9781107415324.004

Hamelin, A. M., Beaudry, M., & Habicht, J. P. (2002). Characterization of household food insecurity in Québec: Food and feelings. *Social Science and Medicine*, *54*(1), 119–132. https://doi.org/10.1016/S0277-9536(01)00013-2

Heald, S. (1991). Tobacco, time and the household economy in two Kenyan societies: the Teso and the Kuria. *Comparative Studies in Society and History*, *33*(1), 130–157. https://doi.org/10.1017/S0010417500016893

Hu, T.-W., & Lee, A. H. (2016). *Women in tobacco farming: Health, equality, and empowerment A study conducted in China, Tanzania and Kenya*. https://www.phi.org/uploads/application/files/cp6dgyk4gsyx1jn3uvzfftd61ohb6sagj5i9x1sw1y8c7vzm39.pdf

International Tobacco Control (ITC) Project. (2015). *ITC Zambia National Report: Findings from the Wave 1 and Wave 2 Surveys (2012-2014)*. *december*, 1–88. http://www.itcproject.org/resources/view/2193

Jerneck, A. (2015). Understanding Poverty: Seeking Synergies Between the Three Discourses of Development, Gender, and Environment. *SAGE Open*. https://doi.org/10.1177/2158244015614875

Jones, A. D., Ngure, F. M., Pelto, G., & Young, S. L. (2013). What are we assessing when we measure food security? A compendium and review of current metrics. *Advances in Nutrition*, *4*(5), 481–505. https://doi.org/10.3945/an.113.004119

Kaai, S. C., Fong, G. T., Ong'ang'o, J. R., Goma, F., Meng, G., Craig, L. V, Ikamari, L., Quah, A. C. K., & Elton-Marshall, T. (2022). Prevalence, perceptions and factors associated with menthol cigarette smoking: findings from the ITC Kenya and Zambia Surveys. *Tobacco Control*, *0*, tobaccocontrol-2021-057100. https://doi.org/10.1136/TOBACCOCONTROL-2021-057100

Khisa, G. V. (2019). Tobacco Growing Condemning Tobacco Farmers to Poverty in Malakisi, Bumula Sub-County. *The Journal of Agriculture and Natural Resources Sciences*, *6*(1), 1–14.

Kibwage, J. K., Odondo, A. J., & Momanyi, G. M. (2009). Assessment of livelihood assets and strategies among tobacco and non tobacco growing households in south Nyanza region, Kenya. *African Journal of Agricultural Research*, *4*(4), 294–304.

Kidane, A., Hepelwa, A., Ngeh, E. T., & Hu, T. W. (2015). A comparative analysis of technical efficiency of smallholder tobacco and maize farmers in Tabora, Tanzania. *Journal of Development and Agricultural Economics*, *7*(2), 72–79.

Kulik, M. C., Bialous, S. A., Munthali, S., & Max, W. (2017). Tobacco growing and the sustainable development goals, Malawi. *Bulletin of the World Health Organization*, *95*(5), 362–367. https://doi.org/10.2471/BLT.16.175596

Labonté, R., Lencucha, R., Goma, F., Zulu, R., & Drope, J. (2019). Consequences of policy incoherence: how Zambia's post-FCTC investment policy stimulated tobacco production. *Journal of Public Health Policy*, *40*, 286–291. https://doi.org/10.1057/s41271-019-00171-8

Labonté, R., Lencucha, R., Drope, J., Packer, C., Goma, F. M., & Zulu, R. (2018). The institutional context of tobacco production in Zambia. *Globalization and Health*, *14*(1). https://doi.org/10.1186/s12992-018-0328-y

Lecours, N., Almeida, G. E. G., Abdallah, J. M., & Novotny, T. E. (2012). Environmental health impacts of tobacco farming: a review of the literature. *Tobacco Control*, *21*(2), 191–196. https://doi.org/10.1136/tobaccocontrol-201

Lencucha, R., Drope, J., Labonte, R., Zulu, R., & Goma, F. (2016). Investment incentives and the implementation of the Framework Convention on Tobacco Control: Evidence from Zambia. *Tobacco Control*, *25*(4), 483–487. https://doi.org/10.1136/tobaccocontrol-2015-052250

Lencucha, R., Reddy, S. K., Labonte, R., Drope, J., Magati, P., Goma, F., Zulu, R., & Makoka, D. (2018). Global tobacco control and economic norms: an analysis of normative commitments in Kenya, Malawi and Zambia. *Health Policy and Planning*, *33*(February), 420–428. https://doi.org/10.1093/heapol/czy005

Leppan, W., Lecours, N., & Buckles, D. (Eds.). (2014). *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press & International Development Research Centre. http://www.palgrave-journals.com/jphp/journal/v36/n1/pdf/jphp201447a.pdf

Li, V. C., Wang, Q., Xia, N., Tang, S., & Wang, C. C. (2012). Tobacco crop substitution: Pilot effort in China. *American Journal of Public Health*, *102*(9), 1660–1663. https://doi.org/10.2105/AJPH.2012.300733

Makoka, D., Appau, A., Lencucha, R., & Drope, J. (2016). *Farm-level economics of tobacco production in Malawi*. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/farm-level-economics-of-tobacco-production-in-malawi-full-report.pdf

Makoka, D., Drope, J., Appau, A., Labonte, R., Li, Q., Goma, F., Zulu, R., Magati, P., & Lencucha, R. (2016). Costs, revenues and profits: An economic analysis of smallholder tobacco farmer livelihoods in Malawi. *Tobacco Control*, *26*(6), 634–640.

https://doi.org/10.1136/tobaccocontrol-2016-053022

Makoka, D., Drope, J., Appau, A., Labonte, R., Li, Q., Goma, F., Zulu, R., Magati, P., & Lencucha, R. (2017). Costs, revenues and profits: An economic analysis of smallholder tobacco farmer livelihoods in Malawi. *Tobacco Control*, *26*(6), 634–640. https://doi.org/10.1136/tobaccocontrol-2016-053022

Mason, N. M., & Tembo, S. T. (2015). *Do Input Subsidy Programs Raise Incomes and Reduce Poverty among Smallholder Farm Households? Evidence from Zambia* (Working Paper 92; Issue February). http://www.iapri.org.zm/

Mubanga, K. H., & Ferguson, W. (2017). Threats to food sufficiency among smallholder farmers in Choma, Zambia. *Food Security*, *9*(4), 745–758. https://doi.org/10.1007/s12571-017-0700-4

Mwansa, I. (2021). TBZ assures farmers that all Tobacco will be bought. In *Zambian Business Times*. https://zambianbusinesstimes.com/tbz-assures-farmers-that-all-tobacco-will-be-bought/

Mwita, M. M. (2012). Shifting Cultivation, Wood Use and Deforestation Attributes of Tobacco Farming in Urambo District, Tanzania. *Current Research Journal of Social Science*, *4*(2), 135–140.

Ochola, S. A., & Kosura, W. (2007). *Case study on tobacco cultivation and possible alternative crops-Kenya*. http://www.who.int/tobacco/framework/cop/events/2007/kenya_case_study.pdf

Otañez, M. ., Mamudu, H. ., & Glantz, S. . (2009). Tobacco companies' use of developing countries' economic reliance on tobacco to lobby against global tobacco control: the case of Malawi. *American Journal of Public Health*, *99*(10), 1759–1771.

https://doi.org/10.2105/AJPH.2009.159590

Prasad, V. . (2007). *Case study of tobacco cultivation and alternate crops in India*. https://www.who.int/tobacco/framework/cop/events/2007/india_case_study.pdf

Quandt, S. A., McDonald, J., Arcury, T. A., Bell, R. A., & Vitolins, M. Z. (2000). Nutritional self-management of elderly widows in rural communities. *The Gerontologist*, *40*(1), 86–96. https://doi.org/10.1093/GERONT/40.1.86

Radel, C. (2011). BECOMING FARMERS: Opening Spaces for Women's Resource Control in Calakmul, Mexico. *Latin American Research Review*, *46*(2), 29–54.

Radimer, K. L., Olson, C. M., Greene, J. C., Campbell, C. C., & Habicht, J. P. (1992). Understanding hunger and developing indicators to assess it in women and children. *Journal of Nutrition Education*, *24*(1), 36S-44S.

Razavi, S., & Miller, C. (1995). *From WID to GAD: Conceptual shifts in the Women and Development discourse*. *1*(3), 1161–1164. https://doi.org/10.1001/archneur.63.8.1161

Reis, M. M. dos, Oliveira, A. P. N. de, Turci, S. R. B., Dantas, R. M., Silva, V. dos S. P. da, Gross, C., & Silva, V. L. da C. e. (2017). Knowledge, attitudes, and practices of women farmers concerning tobacco agriculture in a municipality in Southern Brazil. *Cadernos de saude publica*, *33*(Suppl 3:e00080516), 1–13. https://doi.org/10.1590/0102-311X00080516

Riquinho, D. L., & Hennington, E. A. (2012). Health, environment and working conditions in tobacco cultivation: a review of the literature. *Ciência & Saúde Coletiva*, *17*(6), 1587–1600. https://doi.org/10.1590/S1413-81232012000600022

Rome Declaration on World Food Security. (1996). Food and Agriculture Organization of the United Nations (FAO). http://www.fao.org/3/w3613e/w3613e00.htm

Scoones, I. (2009). Livelihoods perspectives and rural development. *Journal of Peasant Studies*,

36(1), 171–196. https://doi.org/10.1080/03066150902820503

Sirdey, N., & Lemeilleur, S. (2021). Can fair trade resolve the "hungry farmer paradox"? *Review of Agricultural, Food and Environmental Studies 2021 102:1*, *102*(1), 81–106. https://doi.org/10.1007/S41130-021-00137-Z

Smith, M. D., Rabbitt, M. P., & Coleman- Jensen, A. (2017). Who are the World's Food Insecure? New Evidence from the Food and Agriculture Organization's Food Insecurity Experience Scale. *World Development*, *93*, 402–412. https://doi.org/10.1016/J.WORLDDEV.2017.01.006

Swindale, A., & Bilinsky, P. (2006). *Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide (Version 2)*. www.fantaproject.org

Van Minh, H., Giang, K. B., Bich, N. N., Huong, N. T., & Houng, N. T. (2009). Tobacco farming in rural Vietnam: questionable economic gain but evident health risks. *BMC Public Health*, *9*(24), (20 January 2009). https://doi.org/10.1186/1471-2458-9-24

von Eichborn, S., & Abshagen, M.-L. (2015). *Tobacco: Antisocial, unfair, harmful to the environment: Tobacco production and consumption as an example of the complexity of Sustainable Development Goals (SDGs)*. http://www.forumue.de/en/tobacco-antisocial-unfair-harmful-to-the-environment/

World Health Organisation, WHO. (2015). *Status of tobacco production and trade in Africa: Factsheets*. World Health Organization and United Nations. www.who.int

Wolfe, W. S., Frongillo, E. A., & Valois, P. (2003). Understanding the experience of food insecurity by elders suggests ways to improve its measurement. *The Journal of Nutrition*, *133*(9), 2762–2769.

Wood, B., Nelson, C., Kilic, T., & Murray, S. (2013). *Up in Smoke? Agricultural Commercialization, Rising Food Prices and Stunting in Malawi* (No. 6650; Policy Research Working Papers). The World Bank. https://doi.org/10.1596/1813-9450-6650

References in Chapter 3

Alavi, M., Archibald, M., Mcmaster, R., Lopez, V., & Cleary, M. (2018). Aligning theory and methodology in mixed methods research: Before Design Theoretical Placement. *International Journal of Social Research Methodology*, *21*(5), 527–540. https://doi.org/10.1080/13645579.2018.1435016

Braun, V., & Victoria, C. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brown, K. M., Elliott, S. J., Leatherdale, S. T., & Robertson-Wilson, J. (2015). Searching for rigour in the reporting of mixed methods population health research: a methodological review. *Health Education Research*, *30*(6), 811–839. https://doi.org/10.1093/her/cyv046

Caruth, G. D. (2013). Demystifying Mixed Methods Research Design: A Review of the Literature. *Mevlana International Journal of Education*, *3*(2), 112–122. https://doi.org/10.13054/mije.13.35.3.2

Clarke, V., & Braun, V. (2017). Thematic Analysis. *The Journal of Positive Psychology*, *12*(3), 297–298. https://doi.org/10.1080/17439760.2016.1262613

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3).* http://www.fao.org/fileadmin/user_upload/eufao-fsi4dm/doc-training/hfias.pdf

Collins, K. M. T., Hall, P., Onwuegbuzie, A. J., & Johnson, R. B. (2012). Securing a place at the

table: A review and extension of legitimation criteria for the conduct of mixed research. *American Behavioral Scientist*, *56*(6), 849–865. https://doi.org/10.1177/0002764211433799

Creswell, J., & Plano Clark, V. (2007). *Designing and conducting mixed methods research*. Sage Publications.

Evans, B. C., Coon, D. W., & Ume, E. (2011). Use of Theoretical Frameworks as a Pragmatic Guide for Mixed Methods Studies: A Methodological Necessity? *Journal of Mixed Methods Research*, *5*(4), 276. https://doi.org/10.1177/1558689811412972

Fox, N. J., & Alldred, P. (2018). Mixed methods, materialism and the micropolitics of the research-assemblage. *International Journal of Social Research Methodology*, *21*(2), 191–204. https://doi.org/10.1080/13645579.2017.1350015

Goma, F., Drope, J., Zulu, M. R., Li, M. Q., Chelwa, G., Labonté, R., & Banda, M. J. (2017). *The economics of tobacco farming in Zambia*. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/economics-tobacco-farming-zambia-2017.pdf

Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, *2*(1), 7–22. https://doi.org/10.1177/1558689807309969

Greene, J. C. (2012). Engaging critical issues in social inquiry by mixing methods. *American Behavioral Sciences*, *56*(6), 755–773. https://doi.org/10.1177/0002764211433794

Hancock, B. H., Sykes, B. L., & Verma, A. (2018). The problem of "Cameo Appearances" in mixed-methods research: Implications for twenty-first-century ethnography. *Sociological Perspectives*, *61*(2), 314–334. https://doi.org/10.1177/0731121418756045

Hu, T.-W., & Lee, A. H. (2016). *Women in tobacco farming: Health, equality, and empowerment A study conducted in China, Tanzania and Kenya*. https://www.phi.org/uploads/application/files/cp6dgyk4gsyx1jn3uvzfftd61ohb6sagj5i9x1sw

1y8c7vzm39.pdf

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, *33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Kibwage, J. K., Odondo, A. J., & Momanyi, G. M. (2009). Assessment of livelihood assets and strategies among tobacco and non tobacco growing households in south Nyanza region, Kenya. *African Journal of Agricultural Research*, *4*(4), 294–304.

Kulik, M. C., Bialous, S. A., Munthali, S., & Max, W. (2017). Tobacco growing and the sustainable development goals, Malawi. *Bulletin of the World Health Organization*, *95*(5), 362–367. https://doi.org/10.2471/BLT.16.175596

Le, C., XiNan, W., Goyal, A., YunTao, H., WenLong, C., JianHui, H., Xia, X., KeYing, Z., Feng, J., Ying, S., Cai, L., Wu, X., Goyal, A., Han, Y., Cui, W., He, J., Xiao, X., Zhao, K., Jiao, F., … Ying, S. (2013). Multilevel analysis of the determinants of smoking and second-hand smoke exposure in a tobacco-cultivating rural area of southwest China. *Tobacco Control*, *22*(Suppl. 2), ii16–ii20. https://doi.org/10.1136/tobaccocontrol-2012-050850

Maxcy, S. J. (2003). Pragmatic threads in mixed methods research in the social sciences: The search for multiple methods of inquiry and the end of the philosophy of formalism. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioural research* (pp. 51–89). SAGE Publications.

Morse, J. M. (2015). Data were saturated... *Qualitative Health Research*, *25*(5), 587–588. https://doi.org/10.1177/1049732315576699

Small, M. L. (2011). How to Conduct a Mixed Methods Study: Recent Trends in a Rapidly Growing Literature. *Annual Review of Sociology*, *37*, 57–86.

https://doi.org/10.1146/annurev.soc.012809.102657

Sykes, B. L., Verma, A., & Hancock, B. H. (2018). Aligning sampling and case selection in quantitative-qualitative research designs: Establishing generalizability limits in mixed-method studies. *Ethnography*, *19*(2), 227–253. https://doi.org/10.1177/1466138117725341

Tashakkori, A., & Teddlie, C. (2003). The Past and Future of Mixed Methods Research: From Data Triangulation to Mixed Model Designs. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 671–702). Thousand Oaks, CA: Sage Publications.

Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research*, *1*(1), 77–100. https://doi.org/10.1177/1558689806292430

Thanh, N., Hoang, H., Minh, V., Bao, K., Nguyen, G., & Lam, T. (2009). *Impact of Tobacco Growing on the Livelihood and Health of Tobacco Farmers and the Environment: A Preliminary Study in Vietnam*. https://seatca.org/dmdocuments/2_impact_of_tobacco_growing_vietnam.pdf

Venkatesh, V., Brown, S. A., & Bala, H. (2013). Bridging the qualitative-quantitative divide: Guidelines for conducting mixed methods research in information systems. *MIS Quarterly*, *37*(1), 21–54. https://www-jstor-org.proxy.lib.uwaterloo.ca/stable/pdf/43825936.pdf?refreqid=excelsior%3A2d6993d06b4fa64ebda9c3e6528876f5

Venkatesh, V., Brown, S. A., & Sullivan, Y. W. (2016). Guidelines for conducting mixed-method research: An extension and illustration. *Journal of the Association for Information Systems, 17*(7), 435–494. https://pdfs.semanticscholar.org/9848/5554a32a8ae3249fc6ed10a15ff20444e1f6.pdf

Wutich, A. (2011). The moral economy of water re-examined: Reciprocity, water insecurity, and urban survival in Cochabamba, Bolivia. In *Journal of Anthropological Research* (Vol. 67, Issue 1). https://www-jstor-org.proxy.lib.uwaterloo.ca/stable/pdf/41304117.pdf?refreqid=excelsior%3A6dbd3f288a001f44621171942294ca98

References in Chapter 4

African Development Bank, AFDB. (2020). *Zambia - Cashew infrastructure development project (CIDP)*. https://projectsportal.afdb.org/dataportal/VProject/show/P-ZM-AA0-024

Akhter, F., Buckles, D., & Tito, R. H. (2014). Breaking the dependency on tobacco production: Transition Strategies for Bangladesh. In W. Leppan, N. Lecours, & D. Buckles (Eds.), *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press, International Development Research Centre.

Amiresmaeili, M., Yazdi-Feyzabadi, V., & Heidarijamebozorgi, M. (2021). Prevalence of food insecurity and related factors among slum households in Kerman, south of Iran. *International Journal of Health Planning and Management*, *36*(5), 1589–1599. https://doi.org/10.1002/hpm.3242

Anderman, T. L., Remans, R., Wood, S. A., DeRosa, K., & DeFries, R. S. (2014). Synergies and tradeoffs between cash crop production and food security: a case study in rural Ghana. *Food Security*, *6*, 541–554. https://doi.org/10.1007/s12571-014-0360-6

Arcury, T. A., Quandt, S. A., & Preisser, J. S. (2001). Predictors of incidence and prevalence of green tobacco sickness among Latino farmworkers in North Carolina, USA. *Journal of*

Epidemiology and Community Health, *55*(11), 818–824. https://doi.org/10.1136/JECH.55.11.818

Bjornlund, V., Bjornlund, H., & Van Rooyen, A. F. (2020). Why agricultural production in sub-Saharan Africa remains low compared to the rest of the world-a historical perspective. *International Journal of Water Resources Development*, *36*(sup1), S20–S53. https://doi.org/10.1080/07900627.2020.1739512

Boero, V., Cafiero, C., Gheri, F., Kepple, A. W., Moncayo, R., & Viviani, S. (2021). *Access to food in 2020. Results of twenty national surveys using the Food Insecurity Experience Scale (FIES)*. https://doi.org/10.4060/cb5623en

Coburn, C., Restivo, M., & Shandra, J. M. (2015). The African Development Bank and women's health: A cross-national analysis of structural adjustment and maternal mortality. *Social Science Research*, *51*, 307–321. https://doi.org/10.1016/j.ssresearch.2014.09.007

Desiere, S., D'Haese, M., & Niragira, S. (2015). Assessing the cross-sectional and inter-temporal validity of the Household Food Insecurity Access Scale (HFIAS) in Burundi. *Public Health Nutrition*, *18*(15), 2775–2785. https://doi.org/10.1017/S1368980015000403

Dodson, B., Chiweza, A., & Riley, L. (2012). Gender and Food Insecurity in Southern African Cities. In *Urban Food Security Series* (No. 10; Urban Food Security Series No. 10, Issue 10). African Food Security Urban Network. https://scholars.wlu.ca/afsun

Drammeh, W., Hamid, N. A., & Rohana, A. J. (2019). Determinants of household food insecurity and its association with child malnutrition in Sub-Saharan Africa: A review of the literature. *Current Research in Nutrition and Food Science*, *7*(3), 610–623. https://doi.org/10.12944/CRNFSJ.7.3.02

Dudek, H., & Myszkowska-Ryciak, J. (2020). The Prevalence and Socio-Demographic

Correlates of Food Insecurity in Poland. *International Journal of Environmental Research and Public Health*, *17*. https://doi.org/10.3390/ijerph17176221

Endale, W., Birhanu Mengesha, Z., Atinafu, A., & Awoke Adane, A. (2014). *Food Insecurity in Farta District, Northwest Ethiopia: a community based cross-sectional study*. https://doi.org/10.1186/1756-0500-7-130

Fan, S., & Rue, C. (2020). The Role of Smallholder Farms in a Changing World. In S. y Paloma, L. Riesgo, & K. Louhichi (Eds.), *The Role of Smallholder Farms in Food and Nutrition Security* (pp. 13–28). Springer International Publishing. https://doi.org/10.1007/978-3-030-42148-9_2

FAO, IFAD, UNICEF, W. and W. (2021). *Food Security and Nutrition in the World Security , Improved Nutrition and Affordable Healthy Diets for All*. https://doi.org/https://doi.org/10.4060/cb4474en

Food and Agriculture Organisation, FAO. (2018). *Bringing experience-based food insecurity measurement to the global level*. Retrieved from https://www.fao.org/in-action/voices-of-the-hungry/background/en/

Gebrie, Y. F. (2021). Bayesian regression model with application to a study of food insecurity in household level: a cross sectional study. *BMC Public Health*, *21*(1). https://doi.org/10.1186/S12889-021-10674-3

Goma, F., Drope, J., Zulu, M. R., Li, M. Q., Chelwa, G., Labonté, R., & Banda, M. J. (2017). *The economics of tobacco farming in Zambia*. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/economics-tobacco-farming-zambia-2017.pdf

Hamelin, A. M., Beaudry, M., & Habicht, J. P. (2002). Characterization of household food insecurity in Québec: Food and feelings. *Social Science and Medicine*, *54*(1), 119–132.

https://doi.org/10.1016/S0277-9536(01)00013-2

Johnston, D., Stevano, S., Malapit, H. J., Hull, E., & Kadiyala, S. (2018). Review: Time Use as an Explanation for the Agri-Nutrition Disconnect: Evidence from Rural Areas in Low and Middle-Income Countries. *Food Policy*, *76*, 8–18. https://doi.org/10.1016/j.foodpol.2017.12.011

Jones, A. D., Ngure, F. M., Pelto, G., & Young, S. L. (2013). What Are We Assessing When We Measure Food Security? A Compendium and Review of Current Metrics. *Advances in Nutrition*, *4*(5), 481–505. https://doi.org/10.3945/AN.113.004119

Khisa, G. V. (2019). Tobacco Growing Condemning Tobacco Farmers to Poverty in Malakisi, Bumula Sub-County. *The Journal of Agriculture and Natural Resources Sciences*, *6*(1), 1–14.

Kibwage, J. K., Odondo, A. J., & Momanyi, G. M. (2009). Assessment of livelihood assets and strategies among tobacco and non tobacco growing households in south Nyanza region, Kenya. *African Journal of Agricultural Research*, *4*(4), 294–304.

Knueppel, D., Demment, M., & Kaiser, L. (2010). Validation of the household food insecurity access scale in rural Tanzania. *Public Health Nutrition*, *13*(3), 360–367. https://doi.org/10.1017/S1368980009991121

Lecours, N., Almeida, G. E. G., Abdallah, J. M., & Novotny, T. E. (2012). Environmental health impacts of tobacco farming: a review of the literature. *Tobacco Control*, *21*(2), 191–196. https://doi.org/10.1136/tobaccocontrol-201

Magati, P., Li, Q., Drope, J., Lencucha, R., & Labonté, R. (2016). The economics of tobacco farming in Kenya. *International Institute For Legislative Affairs.*

Makoka, D., Appau, A., Lencucha, R., & Drope, J. (2016). *Farm-level economics of tobacco*

production in Malawi. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/farm-level-economics-of-tobacco-production-in-malawi-full-report.pdf

Makoka, D., Drope, J., Appau, A., Labonte, R., Li, Q., Goma, F., Zulu, R., Magati, P., & Lencucha, R. (2017). Costs, revenues and profits: An economic analysis of smallholder tobacco farmer livelihoods in Malawi. *Tobacco Control*, *26*(6), 634–640. https://doi.org/10.1136/tobaccocontrol-2016-053022

Mallick, D., & Rafi, M. (2010). Are Female-Headed Households More Food Insecure? Evidence from Bangladesh. *World Development*, *38*(4), 593–605. https://doi.org/10.1016/J.WORLDDEV.2009.11.004

Mango, N., Makate, C., Mapemba, L., & Sopo, M. (2018). The role of crop diversification in improving household food security in central Malawi. *Agriculture & Food Security*, *7*(7), 1–10. https://doi.org/10.1186/s40066-018-0160-x

Maziya, M., Mudhara, M., & Chitja, J. (2017). What factors determine household food security among smallholder farmers? Insights from Msinga, KwaZulu-Natal, South Africa. *Agrekon*, *56*(1), 40–52. https://doi.org/10.1080/03031853.2017.1283240

Mengistu, D. D., Degaga, D. T., & Tsehay, A. S. (2021). Analyzing the contribution of crop diversification in improving household food security among wheat dominated rural households in Sinana District, Bale Zone, Ethiopia. *Agriculture and Food Security*, *10*(1), 1–15. https://doi.org/10.1186/S40066-020-00280-8/TABLES/6

Mitiku, A., Fufa, B., & Tadese, B. (2012). Empirical analysis of the determinants of rural households food security in Southern Ethiopia: The case of Shashemene District. *Basic Research Journal of Agricultural Science and Review*, *1*(6), 132–138.

Mosa Selepe, B., Shalom Mtyingizane, S., & Mandla Masuku, M. (2015). Factors contributing to

household food insecurity in Mhlontlo area, Eastern Cape, South Africa. *African Journal of Hospitality, Tourism and Leisure*, *4*(1). http//:www.ajhtl.comhttp://www3.imperial.ac.uk/newseventsimages?p_image_type=mainnews2012&p_image_id=19486

Mubanga, K. H., & Ferguson, W. (2017). Threats to food sufficiency among smallholder farmers in Choma, Zambia. *Food Security*, *9*(4), 745–758. https://doi.org/10.1007/s12571-017-0700-4

Mwita, M. M. (2012). Shifting Cultivation, Wood Use and Deforestation Attributes of Tobacco Farming in Urambo District, Tanzania. *Current Research Journal of Social Science*, *4*(2), 135–140.

Nsabuwera, V., Hedt-Gauthier, B., Khogali, M., Edginton, M., Hinderaker, S. G., Nisingizwe, M. P., De Dieu Tihabyona, J., Sikubwabo, B., Sembagare, S., Habinshuti, A., & Drobac, P. (2015). *Making progress towards food security: evidence from an intervention in three rural districts of Rwanda*. https://doi.org/10.1017/S1368980015002207

Nyirenda, J., Zombe, K., Kalaba, G., Siabbamba, C., & Mukela, I. (2021). Exhaustive valorization of cashew nut shell waste as a potential bioresource material. *Scientific Reports 2021 11:1*, *11*(1), 1–14. https://doi.org/10.1038/s41598-021-91571-y

O'Neill. A.O. (2022, February 15). • *Zambia - share of economic sectors in the gross domestic product 2010-2020 | Statista*. Statista: Economy and Politica. https://www.statista.com/statistics/457737/share-of-economic-sectors-in-the-gdp-in-zambia/

Omotesho, O. A., Adewumi, M. O., Muhammad-Lawal, A., & Ayinde, O. E. (2006). Determinants of Food Security Among The Rural Farming Households in Kwara State, Nigeria. *African Journal of General Agriculture African Studies on Population and Health*,

2(1), 7–15. http://www.asopah.org

Otañez, M. ., Mamudu, H. ., & Glantz, S. . (2009). Tobacco companies' use of developing countries' economic reliance on tobacco to lobby against global tobacco control: the case of Malawi. *American Journal of Public Health*, *99*(10), 1759–1771. https://doi.org/10.2105/AJPH.2009.159590

Pretorius, B., Ambuko, J., Papargyropoulou, E., & Schönfeldt, H. C. (2021). Guiding Nutritious Food Choices and Diets along Food Systems. *Sustainability*, *13*(17), 9501. https://doi.org/10.3390/SU13179501

Psaki, S., Bhutta, Z. A., Ahmed, T., Ahmed, S., Bessong, P., Islam, M., John, S., Kosek, M., Lima, A., Nesamvuni, C., Shrestha, P., Svensen, E., Mcgrath, M., Richard, S., Seidman, J., Caulfield, L., Miller, M., Checkley, W., & Network, M. (2012). Household food access and child malnutrition: results from the eight-country MAL-ED study. *Population Health Metrics*, *10*(24). https://doi.org/10.1186/1478-7954-10-24

Quandt, S. A., McDonald, J., Arcury, T. A., Bell, R. A., & Vitolins, M. Z. (2000). Nutritional self-management of elderly widows in rural communities. *The Gerontologist*, *40*(1), 86–96. https://doi.org/10.1093/GERONT/40.1.86

Quisumbing, A. R., & Pandolfelli, L. (2010). Promising Approaches to Address the Needs of Poor Female Farmers: Resources, Constraints, and Interventions. *World Development*, *38*(4), 581–592. https://doi.org/10.1016/J.WORLDDEV.2009.10.006

Radimer, K. L., Olson, C. M., Greene, J. C., Campbell, C. C., & Habicht, J. P. (1992). Understanding hunger and developing indicators to assess it in women and children. *Journal of Nutrition Education*, *24*(1), 36S-44S.

Rubhara, T. T., Mudhara, M., Oduniyi, O. S., & Antwi, M. A. (2020). Impacts of Cash Crop

Production on Household Food Security for Smallholder Farmers: A Case of Shamva District, Zimbabwe. *Agriculture*, *10*(5), 188. https://doi.org/10.3390/agriculture10050188

Sani, S., & Kemaw, B. (2019). Analysis of Rural Households Food Security in Western Ethiopia. *Food and Nutrition Sciences*, *10*, 249–265. https://doi.org/10.4236/fns.2019.103019

Sharafkhani, R., Dastgiri, S., Gharaaghaji, R., Ghavamzadeh, S., & Didarloo, A. (2010). The Role of Household Structure on The Prevalence of Food Insecurity. *European Journal of General Medicine Original Article Eur J Gen Med*, *7*(4), 385–388.

Silvestri, S., Sabine, D., Patti, K., Wiebke, F., Maren, R., Carlos, Q. F., Mario, H., Anthony, N., Nicolas, N., Lieven, C., & Cristina, R. M. (2015). Households and food security: lessons from food secure households in East Africa. *Agriculture & Food Security*, *4*(23), 1–15. https://doi.org/10.1186/s40066-015-0042-4

Smith, M. D., Rabbitt, M. P., & Coleman- Jensen, A. (2017). Who are the World's Food Insecure? New Evidence from the Food and Agriculture Organization's Food Insecurity Experience Scale. *World Development*, *93*, 402–412. https://doi.org/10.1016/J.WORLDDEV.2017.01.006

St-Germain, A. A. F., Galloway, T., & Tarasuk, V. (2019). Food insecurity in Nunavut following the introduction of Nutrition North Canada. *Canadian Medical Association Journal*, *191*(20), E552–E558. https://doi.org/10.1503/cmaj.181617

Van Minh, H., Giang, K. B., Bich, N. N., Huong, N. T., & Houng, N. T. (2009). Tobacco farming in rural Vietnam: questionable economic gain but evident health risks. *BMC Public Health*, *9*(24), (20 January 2009). https://doi.org/10.1186/1471-2458-9-24

Wambogo, E. A., Ghattas, H., Leonard, K. L., & Sahyoun, N. R. (2018). Validity of the Food Insecurity Experience Scale for Use in Sub-Saharan Africa and Characteristics of Food-

Insecure Individuals. *Current Developments in Nutrition*, *2*(9). http://creativecommons.

Wolfe, W. S., Frongillo, E. A., & Valois, P. (2003). Understanding the experience of food insecurity by elders suggests ways to improve its measurement. *The Journal of Nutrition*, *133*(9), 2762–2769.

References in Chapter 5

Amiresmaeili, M., Yazdi-Feyzabadi, V., & Heidarijamebozorgi, M. (2021). Prevalence of food insecurity and related factors among slum households in Kerman, south of Iran. *International Journal of Health Planning and Management*, *36*(5), 1589–1599. https://doi.org/10.1002/hpm.3242

Anderson, C. L., Reynolds, T. W., & Gugerty, M. K. (2017). Husband and Wife Perspectives on Farm Household Decision-making Authority and Evidence on Intra-household Accord in Rural Tanzania. *World Development*, *90*, 169–183. https://doi.org/10.1016/J.WORLDDEV.2016.09.005

Appau, A., Drope, J., Goma, F., Magati, P., Labonté, R., Makoka, D., Zulu, R., Li, Q., & Lencucha, R. (2019). Explaining Why Farmers Grow Tobacco: Evidence from Malawi, Kenya and Zambia. *Nicotine and Tobacco Research*, *September*. https://doi.org/10.1093/ntr/ntz173/5564389

Appau, A., Drope, J., Witoelar, F., Lencucha, R., Chavez, J. J., & Lencucha, R. (2019). Why do farmers grow tobacco? A qualitative exploration of farmers perspectives in Indonesia and Philippines. *International Journal of Environmental Research and Public Health*, *16*(13), 2330. https://doi.org/10.3390/ijerph16132330

Arcury, T. A., & Quandt, S. A. (2006). Health and social impacts of tobacco production. *Journal*

of Agromedicine, *11*(3–4), 71–81. https://doi.org/10.1300/J096v11n03_08

Babalola, A. S. (1988). Tobacco farming and women in rural community of Nigeria. *African Notes, No. 3*, 39–44.

Boeije, H. (2002). A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews. *Quality & Quantity*, *36*, 391–409. https://doi.org/10.1023/A:1020909529486

Boero, V., Cafiero, C., Gheri, F., Kepple, A. W., Moncayo, R., & Viviani, S. (2021). *Access to food in 2020. Results of twenty national surveys using the Food Insecurity Experience Scale (FIES)*. https://doi.org/10.4060/cb5623en

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3).* http://www.fao.org/fileadmin/user_upload/eufao-fsi4dm/doc-training/hfias.pdf

Drope, J., Schluger, N. W., Cahn, Z., Drope, J., Hamill, S., Islami, F., Liber, A., Nargis, N., & Stoklosa, M. (Eds.). (2018). *The Tobacco Atlas* (6th ed.). American Cancer Society and Vital Strategies. www.tobaccoatlas.org

Dudek, H., & Myszkowska-Ryciak, J. (2020). The Prevalence and Socio-Demographic Correlates of Food Insecurity in Poland. *International Journal of Environmental Research and Public Health*, *17*. https://doi.org/10.3390/ijerph17176221

Faria, N. M. X., Fassa, A. G., Meucci, R. D., Fiori, N. S., & Miranda, V. I. (2014). Occupational exposure to pesticides, nicotine and minor psychiatric disorders among tobacco farmers in southern Brazil. *NeuroToxicology*, *45*, 347–354. https://doi.org/10.1016/j.neuro.2014.05.002

Fassa, A. G., Faria, N. M. X., Meucci, R. D., Fiori, N. S., Miranda, V. I., & Facchini, L. A.

(2014). Green tobacco sickness among tobacco farmers in southern Brazil. *American Journal of Industrial Medicine*, *57*(6), 726–735. https://doi.org/10.1002/ajim.22307

Gladwin, C. H., Thomson, A. M., Peterson, J. S., & Anderson, A. S. (2001). Addressing food security in Africa via multiple livelihood strategies of women farmers. *Food Policy*, *26*(2), 177–207. https://doi.org/10.1016/S0306-9192(00)00045-2

Goma, F., Drope, J., Zulu, M. R., Li, M. Q., Chelwa, G., Labonté, R., & Banda, M. J. (2017). *The economics of tobacco farming in Zambia*. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/economics-tobacco-farming-zambia-2017.pdf

Hashmiu, I., Agbenyega, O., & Dawoe, E. (2022). Cash crops and food security: evidence from smallholder cocoa and cashew farmers in Ghana. *Agriculture and Food Security*, *11*(1), 1–21. https://doi.org/10.1186/S40066-022-00355-8/TABLES/4

Hassen, K., Zinab, B., & Belachew, T. (2016). Gender and education as predictors of food insecurity among coffee farming households of the Jimma zone, Southwest of Ethiopia. *BMC Nutrition*, *2*(1), 1–7. https://doi.org/10.1186/S40795-016-0116-0

Herrera, J. P., Rabezara, J. Y., Ravelomanantsoa, N. A. F., Metz, M., France, C., Owens, A., Pender, M., Nunn, C. L., & Kramer, R. A. (2021). Food insecurity related to agricultural practices and household characteristics in rural communities of northeast Madagascar. *Food Security*, *13*(6), 1393. https://doi.org/10.1007/S12571-021-01179-3

Karki, S., Burton, P., Mackey, B., & Alston-Knox, C. (2021). Status and drivers of food insecurity and adaptation responses under a changing climate among smallholder farmers households in Bagmati Province, Nepal. *Environment, Development and Sustainability*, *23*(10), 14642–14665. https://doi.org/10.1007/S10668-021-01262-X

Khisa, G. V. (2019). Tobacco Growing Condemning Tobacco Farmers to Poverty in Malakisi,

Bumula Sub-County. *The Journal of Agriculture and Natural Resources Sciences*, *6*(1), 1–14.

Kidane, H., Alemu, Z., & Kundhlande, G. (2005). Causes of household food insecurity in Koredegaga Peasant Association, Oromiya Zone, Ethiopia. *Agrekon*, *44*(4), 543–560.

Kitto, S. C., Chesters, J., & Grbich, C. (2008). Quality in qualitative research Criteria for authors and assessors in the submission and assessment of qualitative research articles for the Medical Journal of Australia. *REVIE W The Medical Journal of Australia*, *188*, 243–246. www.mja.com.au

Komatsu, H., Malapit, H. J. L., & Theis, S. (2018). Does women's time in domestic work and agriculture affect women's and children's dietary diversity? Evidence from Bangladesh, Nepal, Cambodia, Ghana, and Mozambique. *Food Policy*, *79*, 256–270. https://doi.org/10.1016/J.FOODPOL.2018.07.002

Lecours, N., Almeida, G. E. G., Abdallah, J. M., & Novotny, T. E. (2012). Environmental health impacts of tobacco farming: a review of the literature. *Tobacco Control*, *21*(2), 191–196. https://doi.org/10.1136/tobaccocontrol-201

Leppan, W., Lecours, N., & Buckles, D. (Eds.). (2014). *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press & International Development Research Centre. http://www.palgrave-journals.com/jphp/journal/v36/n1/pdf/jphp201447a.pdf

Lowder, S. K., Sánchez, M. V., & Bertini, R. (2021). Which farms feed the world and has farmland become more concentrated? *World Development*, *142*, 105455. https://doi.org/10.1016/J.WORLDDEV.2021.105455

Makoka, D., Appau, A., Lencucha, R., & Drope, J. (2016). *Farm-level economics of tobacco*

production in Malawi. https://www.cancer.org/content/dam/cancer-org/research/economic-and-healthy-policy/farm-level-economics-of-tobacco-production-in-malawi-full-report.pdf

Makoka, D., Drope, J., Appau, A., Labonte, R., Li, Q., Goma, F., Zulu, R., Magati, P., & Lencucha, R. (2016). Costs, revenues and profits: An economic analysis of smallholder tobacco farmer livelihoods in Malawi. *Tobacco Control*, *26*(6), 634–640. https://doi.org/10.1136/tobaccocontrol-2016-053022

Makoka, D., Drope, J., Appau, A., Labonte, R., Li, Q., Goma, F., Zulu, R., Magati, P., & Lencucha, R. (2017). Costs, revenues and profits: An economic analysis of smallholder tobacco farmer livelihoods in Malawi. *Tobacco Control*, *26*(6), 634–640. https://doi.org/10.1136/tobaccocontrol-2016-053022

Mason, N. M., & Tembo, S. T. (2015). *Do Input Subsidy Programs Raise Incomes and Reduce Poverty among Smallholder Farm Households? Evidence from Zambia* (Working Paper 92; Issue February). http://www.iapri.org.zm/

Maziya, M., Mudhara, M., & Chitja, J. (2017). What factors determine household food security among smallholder farmers? Insights from Msinga, KwaZulu-Natal, South Africa. *Agrekon*, *56*(1), 40–52. https://doi.org/10.1080/03031853.2017.1283240

Morse, J. M. (2015). Data were saturated... *Qualitative Health Research*, *25*(5), 587–588. https://doi.org/10.1177/1049732315576699

Mubanga, K. H., & Ferguson, W. (2017). Threats to food sufficiency among smallholder farmers in Choma, Zambia. *Food Security*, *9*(4), 745–758. https://doi.org/10.1007/s12571-017-0700-4

Na, M., Caswell, B. L., Talegawkar, S. A., & Palmer, A. (2017). Monthly food insecurity assessment in rural mkushi district, Zambia: A longitudinal analysis. *BMC Public Health*,

17(1). https://doi.org/10.1186/s12889-017-4176-0

Owoo, N. S. (2021). Demographic considerations and food security in Nigeria. *Journal of Social and Economic Development*, *23*(1), 128–167. https://doi.org/10.1007/s40847-020-00116-y

Quisumbing, A. R., Meinzen-Dick, R., Raney, T. L., Croppenstedt, A., Behrman, J. A., & Peterman, A. (Eds.). (2014). *Gender in Agriculture: Closing the knowledge gap*. FAO and Springer. https://doi.org/10.1007/978-94-017-8616-4

Quisumbing, A. R., Rubin, D., Manfre, C., Waithanji, E., van den Bold, M., Olney, D., Johnson, N., & Meinzen-Dick, R. (2015). Gender, assets, and market-oriented agriculture: learning from high-value crop and livestock projects in Africa and Asia. *Agriculture and Human Values*, *32*(4), 705–725. https://doi.org/10.1007/S10460-015-9587-X

Radimer, K. L., Olson, C. M., Greene, J. C., Campbell, C. C., & Habicht, J. P. (1992). Understanding hunger and developing indicators to assess it in women and children. *Journal of Nutrition Education*, *24*(1), 36S-44S.

Raney, T., Anríquez, G., Croppenstedt, A., Gerosa, S., Lowder, S. K., Matuschke, I., & Skoet, J. (2011). The role of women in agriculture. In *ESA Working Paper No. 11-02* (No. 11–02; ESA Working Papers). https://doi.org/10.22004/ag.econ.289018

Rapsomanikis, G. (2015). *The economic lives of smallholder farmers: An analysis based on household data from nine countries.* Food and Agriculture Organization of the United Nations.

Riquinho, D. L., & Hennington, É. A. (2014). Tobacco cultivation in the south of Brazil: green tobacco sickness and other health problems. *Ciência & Saúde Coletiva*, *19*(12), 4797–4808. https://doi.org/10.1590/1413-812320141912.19372013

Rubhara, T. T., Mudhara, M., Oduniyi, O. S., & Antwi, M. A. (2020). Impacts of Cash Crop

Production on Household Food Security for Smallholder Farmers: A Case of Shamva District, Zimbabwe. *Agriculture*, *10*(5), 188. https://doi.org/10.3390/agriculture10050188

Schmitt, N. M., Schmitt, J., Kouimintzis, D. J., & Kirch, W. (2007). Health risks in tobacco farm workers - A review of the literature. *Journal of Public Health*, *15*(4), 255–264. https://doi.org/10.1007/s10389-007-0122-4

Shibata, R., Cardey, S., & Dorward, P. (2020). Gendered Intra-Household Decision-Making Dynamics in Agricultural Innovation Processes: Assets, Norms and Bargaining Power. *Journal of International Development*, *32*(7), 1101–1125. https://doi.org/10.1002/JID.3497

Silvestri, S., Sabine, D., Patti, K., Wiebke, F., Maren, R., Carlos, Q. F., Mario, H., Anthony, N., Nicolas, N., Lieven, C., & Cristina, R. M. (2015). Households and food security: lessons from food secure households in East Africa. *Agriculture & Food Security*, *4*(23), 1–15. https://doi.org/10.1186/s40066-015-0042-4

Smith, M. D., Rabbitt, M. P., & Coleman- Jensen, A. (2017). Who are the World's Food Insecure? New Evidence from the Food and Agriculture Organization's Food Insecurity Experience Scale. *World Development*, *93*, 402–412. https://doi.org/10.1016/J.WORLDDEV.2017.01.006

Tankari, M. R. (2017). Cash crops reduce the welfare of farm households in Senegal. *Food Security*, *9*(5), 1105–1115. https://doi.org/10.1007/s12571-017-0727-6

The State of Food Security and Nutrition in the World 2021. (2021). *The State of Food Security and Nutrition in the World 2021*. https://doi.org/10.4060/CB4474EN

Wichern, J., Van Wijk, M. T., Descheemaeker, K., Frelat, R., Van Asten, P. J. A., & Giller, K. E. (2017). Food availability and livelihood strategies among rural households across Uganda. *Food Security*, *9*, 1385–1403. https://doi.org/10.1007/s12571-017-0732-9

Wolfe, W. S., Frongillo, E. A., & Valois, P. (2003). Understanding the experience of food insecurity by elders suggests ways to improve its measurement. *The Journal of Nutrition, 133*(9), 2762–2769.

Zambia Statistics Agency, Ministry of Health (MOH) Zambia, and ICF. 2019. Zambia Demographic and Health Survey 2018. Lusaka, Zambia, and Rockville, Maryland, USA: Zambia Statistics Agency, Ministry of Health, and ICF. Retrieved from https://www.dhsprogram.com/pubs/pdf/FR361/FR361.pdf

References in Chapter 6

Babalola, A. S. (1988). Tobacco farming and women in rural community of Nigeria. *African Notes, No. 3,* 39–44.

Banks, A. M. (2009). CEDAW, Compliance, and Custom: Human Rights Enforcements in Sub-Saharan Africa. *Fordham International Law Journal*, *32*(3), 781–845.

Cornwall, A., & Rivas, A.-M. (2015). From 'gender equality and "women's empowerment" to global justice: reclaiming a transformative agenda for gender and development. *Third World Quarterly*, *36*(2), 396–415. https://doi.org/10.1080/01436597.2015.1013341

Doss, C., Meinzen-Dick, R., Quisumbing, A., & Theis, S. (2018). Women in agriculture: Four myths. *Global Food Security*, *16*, 69–74. https://doi.org/10.1016/J.GFS.2017.10.001

Drope, J., Schluger, N. W., Cahn, Z., Drope, J., Hamill, S., Islami, F., Liber, A., Nargis, N., & Stoklosa, M. (Eds.). (2018). *The Tobacco Atlas* (6th ed.). American Cancer Society and Vital Strategies. www.tobaccoatlas.org

Englehart, N. A., & Miller, M. K. (2014). The CEDAW Effect: International Law's Impact on

Women's Rights. *Http://Dx.Doi.Org/10.1080/14754835.2013.824274*, *13*(1), 22–47. https://doi.org/10.1080/14754835.2013.824274

Food Agriculture Organisation, FAO. (2018). *National gender profile of agriculture and rural livelihoods - Zambia* (Country Gender Assessment Series).

Frischmuth, C. (1995). *Gender is not a sensitive issue: Institutionalizing a gender-oriented participatory approach in Siavonga, Zambia* (GATEKEEPER SERIES No. 72). https://pubs.iied.org/pdfs/6133IIED.pdf?

Gammage, S., Kabeer, N., & van der Meulen Rodgers, Y. (2016). Voice and Agency: Where Are We Now? In *Feminist Economics* (Vol. 22, Issue 1, pp. 1–29). Routledge. https://doi.org/10.1080/13545701.2015.1101308

Heald, S. (1991). Tobacco, time and the household economy in two Kenyan societies: the Teso and the Kuria. *Comparative Studies in Society and History*, *33*(1), 130–157. https://doi.org/10.1017/S0010417500016893

Hu, T.-W., & Lee, A. H. (2016). *Women in tobacco farming: Health, equality, and empowerment A study conducted in China, Tanzania and Kenya*. https://www.phi.org/uploads/application/files/cp6dgyk4gsyx1jn3uvzfftd61ohb6sagj5i9x1sw1y8c7vzm39.pdf

Hu, T., & Lee, A. H. (2015). Tobacco control and tobacco farming in African countries. *Journal of Public Health Policy*, *36*(1), 41–51. https://doi.org/10.1057/jphp.2014.47

Khader, S. (2018). Passive empowerment: How women's agency became women doing it all. *Philosophical Topics*, *46*(2), 141–163. https://doi.org/10.5840/PHILTOPICS201846216

Lecours, N., Almeida, G. E. G., Abdallah, J. M., & Novotny, T. E. (2012). Environmental health impacts of tobacco farming: a review of the literature. *Tobacco Control*, *21*(2), 191–196.

https://doi.org/10.1136/tobaccocontrol-201

Leppan, W., Lecours, N., & Buckles, D. (Eds.). (2014). *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press & International Development Research Centre. http://www.palgrave-journals.com/jphp/journal/v36/n1/pdf/jphp201447a.pdf

Marcus, R. (2018). *The norms factor: Recent research on gender, social norms, and women's economic empowerment*. www.idrc.ca/grow

Parpart, J. L., Connelly, M. P., & Barriteau, V. E. (Eds.). (2000). *Theoretical perspectives on gender and development*. International Development Research Centre.

Radel, C. (2011). BECOMING FARMERS: Opening Spaces for Women's Resource Control in Calakmul, Mexico. *Latin American Research Review*, *46*(2), 29–54.

Rai, S. M. (2002). *Gender and the political economy of development: from nationalism to globalization*. Polity, Blackwell.

Rai, S. M. (2011). Gender and development: Theoretical perspectives. In N. Visvanathan, L. Duggan, N. Wiegersma, & L. Nisonoff (Eds.), *The Women, Gender and Development Reader*. Fernwood Publishing.

Razavi, S., & Miller, C. (1995). *From WID to GAD: Conceptual shifts in the Women and Development discourse*. *1*(3), 1161–1164. https://doi.org/10.1001/archneur.63.8.1161

Rebouché, R. (2006). Labor, Land, and Women's Rights in Africa: Challenges for the New Protocol on the Rights of Women. *Harvard Human Rights Journal*, *19*, 235–256. https://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=21517424&site=ehost-live

Shibata, R., Cardey, S., & Dorward, P. (2020). Gendered Intra-Household Decision-Making Dynamics in Agricultural Innovation Processes: Assets, Norms and Bargaining Power.

Journal of International Development, *32*(7), 1101–1125. https://doi.org/10.1002/JID.3497

Stubbs, J. (1985). *Rural tobacco women in Cuba: San Luis and Cabaiguan 1940-1980.* (p. 9pp.).

Stubbs, J. (1987). Gender issues in contemporary Cuban tobacco farming. *World Development*, *15*(1), 41–65.

Verschuur, C. (2014). A history of development through a gender prism: Feminist and Decolonial perspectives. In C. Verschuur, I. Guérin, & H. Guétat-Bernard (Eds.), *Under development: Gender* (pp. 17–41). Palgrave Macmillan.

World Economic Forum. (2021). *Global Gender Gap Report 2021*. Retrieved from http://reports.weforum.org/global-

References in Chapter 7

Anderson, C. L., Reynolds, T. W., & Gugerty, M. K. (2017). Husband and Wife Perspectives on Farm Household Decision-making Authority and Evidence on Intra-household Accord in Rural Tanzania. *World Development*, *90*, 169–183. https://doi.org/10.1016/J.WORLDDEV.2016.09.005

Cai, L., Wu, X., Goyal, A., Han, Y., Cui, W., Xiao, X., He, J., Zhao, K., Song, Y., Jiao, F., Le, C., XiNan, W., Goyal, A., YunTao, H., WenLong, C., Xia, X., JianHui, H., KeYing, Z., Ying, S., & Feng, J. (2012). Patterns and socioeconomic influences of tobacco exposure in tobacco cultivating rural areas of Yunnan Province, China. *BMC Public Health*, *12*(842), (4 October 2012). https://doi.org/10.1186/1471-2458-12-842

Coates, J., Swindale, A., & Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3).* http://www.fao.org/fileadmin/user_upload/eufao-fsi4dm/doc-training/hfias.pdf

Everett, J. M., & Charlton, S. E. M. (2014). *Women navigating globalization: Feminist approaches to*

development. Rowman & Littlefield.

Food and Agriculture Organisation, FAO. (2013). *Smallholder and family farms* (pp. 1–4). Food and Agriculture Organization of the United Nations (FAO). Retrieved from http://www.fao.org/3/ar588e/ar588e.pdf

Food and Agriculture Organisation, FAO. (2017). *Ending poverty and hunger by investing in agriculture and rural areasNG SDG 1 AND SDG 2 EXAMPLES OF STRATEGIC INVESTMENTS FOR POVERTY REDUCTION*.

Gilmore, A. B., Fooks, G., Drope, J., Bialous, S. A., & Jackson, R. R. (2015). Exposing and addressing tobacco industry conduct in low-income and middle-income countries. *The Lancet*, *385*(9972), 1029–1043. https://doi.org/10.1016/S0140-6736(15)60312-9

Gomez, S., Laura, P., & Louhichi, R. K. (2020). *The Role of Smallholder Farms in Food and Nutrition Security*. Springer Nature Switzerland AG. https://doi.org/https://doi.org/10.1007/978-3-030-42148-9

Hu, T.-W., & Lee, A. H. (2016). *Women in tobacco farming: Health, equality, and empowerment A study conducted in China, Tanzania and Kenya*. https://www.phi.org/uploads/application/files/cp6dgyk4gsyx1jn3uvzfftd61ohb6sagj5i9x1sw1y8c7vzm39.pdf

Leppan, W., Lecours, N., & Buckles, D. (Eds.). (2014). *Tobacco Control and Tobacco Farming: Separating Myth from Reality*. Anthem Press & International Development Research Centre. http://www.palgrave-journals.com/jphp/journal/v36/n1/pdf/jphp201447a.pdf

Lowder, S. K., Sánchez, M. V., & Bertini, R. (2021). Which farms feed the world and has farmland become more concentrated? *World Development*, *142*, 105455. https://doi.org/10.1016/J.WORLDDEV.2021.105455

Lubungu, M., & Singogo, F. K. (2021). *2021 Zambia Food Security and Nutrition Report*.

Marcus, R. (2018). *The norms factor: Recent research on gender, social norms, and women's*

economic empowerment. www.idrc.ca/grow

Mason, N. M., & Tembo, S. T. (2015). *Do Input Subsidy Programs Raise Incomes and Reduce Poverty among Smallholder Farm Households? Evidence from Zambia*. http://www.iapri.org.zmandhttp//www.aec.msu.edu/fs2/zambia/index.htm

Prowse, M. (2022). Tobacco Contract Farming, Crop Diversification and Household Relations in the Central Region of Malawi. *Journal of Southern African Studies*, *48*(2), 355–374. https://doi.org/10.1080/03057070.2022.2043653

Rai, S. M. (2002). *Gender and the political economy of development: from nationalism to globalization*. Polity, Blackwell.

Rai, S. M. (2011). Gender and development: Theoretical perspectives. In N. Visvanathan, L. Duggan, N. Wiegersma, & L. Nisonoff (Eds.), *The Women, Gender and Development Reader*. Fernwood Publishing.

Razavi, S., & Miller, C. (1995). *From WID to GAD: Conceptual shifts in the Women and Development discourse*. *1*(3), 1161–1164. https://doi.org/10.1001/archneur.63.8.1161

Scoones, I. (1998). *Sustainable Rural Livelihoods: a framework for analysis* (No. 72).

Scoones, I. (2009). Livelihoods perspectives and rural development. *Journal of Peasant Studies*, *36*(1), 171–196. https://doi.org/10.1080/03066150902820503

Shibata, R., Cardey, S., & Dorward, P. (2020). Gendered Intra-Household Decision-Making Dynamics in Agricultural Innovation Processes: Assets, Norms and Bargaining Power. *Journal of International Development*, *32*(7), 1101–1125. https://doi.org/10.1002/JID.3497

Verschuur, C. (2014). A history of development through a gender prism: Feminist and Decolonial perspectives. In C. Verschuur, I. Guérin, & H. Guétat-Bernard (Eds.), *Under development: Gender* (pp. 17–41). Palgrave Macmillan.

Visvanathan, N., Duggan, L., Wiegersma, N., & Nisonoff, L. (Eds.). (2011). *The Women, Gender and Development Reader*. Fernwood Publishing.

World Economic Forum, WEF. (2021). *Global Gender Gap Report 2021*. Retrieved from http://reports.weforum.org/global-

Zambia Statistics Agency, Ministry of Health (MOH) Zambia, and ICF. 2019. Zambia Demographic and Health Survey 2018. Lusaka, Zambia, and Rockville, Maryland, USA: Zambia Statistics Agency, Ministry of Health, and ICF. Retrieved from https://www.dhsprogram.com/pubs/pdf/FR361/FR361.pdf

Appendices

A. Survey Questionnaire

RESEARCH PROJECT: FOOD SECURITY AND TOBACCO FARMING IN RURAL ZAMBIA SURVEY QUESTIONNAIRE | INTRODUCTION AND CONSENT

CONSENT FORM time start └─┘└─┘ : └─┘└─┘

***Introduction*:** Good morning/afternoon. I am a graduate student at the School of Public Health and Health Systems (SPHHS), University of Waterloo, Canada. I am conducting research exploring the relationship between food insecurity and tobacco farming in Kaoma and Nkeyema, Zambia under the supervision of Professor Craig Janes at the University of Waterloo with local supervision by Professor Fastone Goma of the Centre for Primary Care Research, University of Zambia.

***Purpose of the study*:** You have been selected because you live in this community and because of your experience with tobacco and/or food crop farming. If you agree to participate, the survey should take about **forty minutes**. The questions are quite general. For instance, you will be asked general questions about your age, education, marital status and occupation to help describe this community. You will also be asked about your experiences in either food or tobacco or both; and you will be asked questions about food scarcity within your household and the health of members of your family. The data collected during these interviews will contribute to helping government and other stakeholders develop progressive interventions in sustainable alternative agricultural livelihoods.

Voluntary participation: Your involvement in this survey is entirely voluntary and there are no known or anticipated risks to participation in this study. However, you may decline answering any questions you feel you do not wish to answer or that make you uncomfortable. You can stop answering questions at any time.

Confidentiality: Your identity will be kept private and your answers will be grouped with answers from other participants. Further, you will not be identified by name in any thesis, report or publication resulting from this study. The data collected will be kept for a period of five years on a password protected research drive at the University of Waterloo to which only myself and my supervisor have access.

This study has been reviewed and received ethics clearance through a University of Waterloo Research Ethics Committee (ORE# 41455) and also through the Biomedical Research Ethics Committee, University of Zambia (ORE# 708-2020).

If you have questions for either of these Committees, contact

(i) the Office of Research Ethics, University of Waterloo, at 1-519-888-4567 ext. 36005 or ore ceo@uwaterloo.ca

OR

(ii) The Chairperson, University of Zambia Biomedical Research Ethics Committee, Ridgeway Campus, Lusaka, Zambia or unzarec@zamtel.zm

Thank you for your interest in this study.

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CONSENT

Do you agree to take part in this survey?	1. Yes 2. No ➔ END INTERVIEW
Is respondent able to read and write?	1. Yes ➔ SIGNATURE COLUMN 2. No ➔ ORAL CONSENT (Enumerator)

RESPONDENT SIGNATURE RESPONDENT SIGN OR THUMBPRINT HERE TO CONSENT	**ORAL (Enumerator)** ORAL CONSENT BY RESPONDENT
(.....)	Name: Signature: (.....)
Date ⌊_⌊_⌋ / ⌊_⌊_⌋ / ⌊_⌊_⌊_⌊_⌋	Date ⌊_⌊_⌋ / ⌊_⌊_⌋ / ⌊_⌊_⌊_⌊_⌋

Respondent code	

Part A Demographic Characteristics

A1 Respondent sex

1	Male	2	Female

A2 What is your position in this household (*if respondent is not the household head, please identify on A2.1 if the household head is male/female*)

1	Male head	3	Spouse
2	Female head	4	Other: ……

A2.1 Sex of the household head

1	Male	2	Female

A3 How old are you?

1	20 - 29	4	50 - 59
2	30 - 39	5	60 - 69
3	40 - 49	6	> 70

A4 What is your marital status?

1	Single (Never married)	4	Widowed
2	Married (monogamous)	5	Divorced/Separated
3	Married (polygamous)		

A5 How many people, including yourself, live in this house? (*eating from the same pot*)

1	< 3	3	7 to 9

2	4 to 6	4	>10
# of children: ……..		# of workers: ……	

A6 What is your highest level of schooling?

0	None	4	Senior Secondary (Grade 10 – 12)
1	Junior Primary (Grade 1 – 4)	5	College
2	Senior Primary (Grade 5 – 7)	6	University
3	Junior Secondary (Grade 8 – 9)		

A7 What is your main occupation? (*work that gives the most income*)

1	Farmer	4	Civil servant
2	Trader	5	Other……
3	Hunter		

A8 What is your estimated household expenditure per month on each of the following:

1	Education …….	4	
2	Healthcare ……	5	
3	Food …….		

Part B Farmer characteristics

B1 Are you a tobacco farmer?

0	No	1	Yes

B1.1 If yes to (B1), how many years have you grown tobacco? …….

B2 Are you growing tobacco in this farming season (2019/2020)?

0	No	1	Yes

B3 Do you grow food crops?

0	No	1	Yes

B4 If food crop(s), what?

1	Maize	4	Soya beans	7	Sorghum
2	Cassava	5	Mixed beans	8	Potatoes
3	Groundnuts	6	Millet	9	Other.....

B5 What is the size of all your farmland? *Some farmers use 'acres' as the unit, in which case 1 ha = 2.47 acres*

1	< 1 hectare	4	21 to 30 hectares
2	2 to 10 hectares	5	31 to 40 hectares
3	11 to 20 hectares	6	> 40 hectares

For each of the questions below, land size in hectares will be collected and the researcher will estimate proportions thereafter.

B6.1 How much of your farmland are you using to grow tobacco?.....(….%)
B6.2 How much of your farmland are you using to grow food crops?.....(….%)
B6.3 How much of your farmland is not cultivated?..... (……..%)

B7 What is your income at the end of the farming season, after costs (loans, inputs, paying workers (*if respondent income is mainly from farming*): K……

Part C Access to Food in the household

C1 What is the main food crop you frequently eat in this house?

1	Maize (*nshima*)	3	Cassava
2	Rice	4	Other: ….....

C1.1. What is the relish you eat with this food? (*check all that apply*)

1	Protein (fish, bushmeat, goatmeat, chicken, beef)	3	Vegetables (rape, spinach, cabbage
2	Gravy	4	Other: ….....

C2 Where do you get this food (*specify from C1*) from?

1	Family farm	2	Buy from market

C3 How much do you spend on food per week?

1	< K100	3	K500 - K999
2	K100 - K499	4	> K1000

C4 How long does the food you grow last to feed your household?

1	< 3 months	2	3 - 6 months
3	7 - 10 months	4	> 10 months

C5 Who in this house makes sure there is food to eat?

1	Man	3	Both
2	Woman		

C6 During meal times, how is food allocated? (*use 1 - 6 ranking to probe who gets the most food, 1 for most, 6 for least*)

Man	Child(ren)
Woman	Elderly
Workers	Grandchildren

Part D Household Food Insecurity Access Scale

1 In the past four weeks, did you worry that your household would not have enough food

0	No (skip to 2)	
1	Yes	*1a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

2 In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?

0	No (skip to 3)	
1	Yes	*2a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

3 In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?

0	No (skip to 4)	
1	Yes	*3a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

4 In the past four weeks, 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

0	No (skip to 5)	
1	Yes	*4a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

5 In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?

0	No (skip to 6)	
1	Yes	*5a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

6 In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?

0 No (skip to 7)	
1 Yes	*6a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

7 In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?

0 No (skip to 8)	
1 Yes	*7a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

8 In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?

0 No (skip to 9)	
1 Yes	*8a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

9 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?

0 No	*Section ends*
1 Yes	*9a How often did this happen?* 1 Rarely (once or twice in the past four weeks) 2 Sometimes (three to ten times in the past four weeks) 3 Often (more than ten times in the past four weeks)

Part E General household health characteristics

E1 What is the most common reason you or any member of your house goes to the hospital/health post for treatment?

1 Fever	5 Feel like vomiting
2 Cold/chest pain	6 Stiffness (of joints)
3 Diarrhoea	7 Other (*specify*)…….
4 Stomach pain	

E2 Has any member of your house felt ill due to any of the above (E1:1-7) in the last 30 days?

0 No	1 Yes

E3 In the different parts of tobacco farming season, please indicate which of the above (E1:1-7) you or any member of your family most frequently experience?

E3.1 Nursery development (Jul – Aug) 1 2 3 4 5 6 7	E3.3 Harvesting, curing and baling (Jan – Mar) 1 2 3 4 5 6 7
E3.2 Transplanting (Sep – Dec) 1 2 3 4 5 6 7	E3.4 Selling (Apr – Jul) 1 2 3 4 5 6 7

WE HAVE COME TO THE END OF THE QUESTIONNAIRE.
THANK YOU VERY MUCH FOR YOUR TIME.

B. Interviews and focus group discussion guide

Guiding questions to explore potential effects of tobacco farming on food insecurity in households, women, and children

Categories	Discussion/probe questions
Land & labour allocation to tobacco	What is the average size of family lands? Is there any differentiation between what men and women may grow?
	How much land is usually allocated to growing tobacco?
	How is land allocation to tobacco growing changing? (probe reasons for increase or decrease)
	How do household members participate in growing tobacco? Who does what, and when? (probes labour allocation & burden)
Land & Labour allocation to food	How much land is usually allocated to growing food?
	How is land allocation to food changing? (probe reasons for increase or decrease)
	How do household members participate in growing food? Who does what, and when? (probes labour allocation & burden)
Household responsibility for providing food	How does the average household get food? From where? Who does what?
Access and Decision-making around growing tobacco or food?	How do household members (men, women, children, the elderly) benefit from dominant livelihood strategy?
	Who has access to, and control over land?
	What are women's specific needs and constraints in the household livelihood/farming option?
	Are these needs taken into account?
	What conditions may cause women to be excluded from the use and benefits of household livelihood alternatives?

	How is access to, and control over land affected by livelihood strategy - food or tobacco cultivation?
	Who benefits from and decides on the use of income? Is there a risk that this may lead to an increase in gender disparities?
Food security and nutrition diversity	If households are not tobacco growing, what else would/could they focus on?
	Is there a potential for household income increase with switching out of tobacco to alternative livelihood strategies? What is the estimated size of change? Who benefits from this?
	Will food or cash crops be grown?
	How will switching out, crop rotation, or intercropping affect household food security?
	If food or cash crops are grown, who controls income?
	How much income to allocated to household food and health expenses? Who decides this?
Health	How will crop switching or diversification affect household nutrition?
	How will household members benefit? (Probe: Will household members benefit equally?)
	During what periods of the farming season do people report being most ill?
	What are the most common reasons people seek health care during the growing season? (take note of symptoms)