Factors influencing Malawian tobacco farmers' decisions regarding contracting

By

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Tobacco plays a very significant role in Malawi's economy by being the largest foreign exchange earner for the economy. The Integrated Production System was implemented in 2012 to promote contract production and also improve quality of tobacco which would therefore fetch higher prices for farmers. Contract farming has been believed to be potentially beneficial, but many farmers still choose not to produce under contract. This study examines factors that influence farmers' tobacco contracting decisions. 300 farmers were interviewed for the study using a structured questionnaire. Data was analyzed with logit model using SAS software. Expected auction market price, expected fertilizer cost for contract tobacco production, and the number of years farmers have grown tobacco are negatively related to producers' adoption of contract production. Expected contract market prices, expected non-contract fertilizer cost, loan expectations, number of years farmer has previously contracted and off-farm income are positively related to contract adoption.

DEDICATION

To my wife Ulemu Diana Singini and M’zonse Singini and Ungweru Singini

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LIST OF ABBREVIATIONS

USAID	United States Agency for International Development
UILTCB	USAID Initiative for Long Term Capacity Building
MoAFS	Ministry of Agriculture and Food Security
TCC	Tobacco Control Commission
AHL	Auction Holdings Limited
TAMA	Tobacco Association of Malawi
NASFAM	National Association of Smallholder Farmers
ATC	Associated Tobacco Company
NDDF	Northern Division Dark Fired
SDDF	Southern Division Dark Fired
IPS	Integrated Production System
IRB	International Review Board
EPA	Extension Planning Area
AEDEC	Agricultural Extension Development Coordinator
JC	Junior Certificate
MSCE	Malawi School Certificate of Education

CHAPTER I

INTRODUCTION

Malawi's economy hugely depends on agriculture which represents about 39 percent of the Gross Domestic Product (GDP), 85 percent of the total labor force and generates about 83 percent of the foreign exchange earnings (Chirwa et al. 2008). Tobacco is an important crop as it contributes more than 70 percent of the total agricultural exports. It also contributes close to 15 percent of the country's GDP and about 25 percent of the tax revenues. The tobacco sector provides income to about 20 percent of the country's population (CIA 2013; Government of Malawi 2005, 2006a; Jaffee 2003).

The institutional organization of the tobacco industry starts with the Ministry of Agriculture and Food Security (MoAFS) which provides policy direction under the Tobacco Act and the Control of Tobacco Auction Floors Act. The Ministry is responsible for appointing members to the Board of Directors of the industry's regulatory body, the Tobacco Control Commission (TCC). Since the introduction of minimum prices, the ministry is also responsible for setting the minimum price for each of the different tobacco grades for each tobacco type.

The TCC is responsible for regulating and promoting the tobacco industry under the Control of Tobacco Auction Floors Act. Its duties include regulating production, manufacture and marketing of tobacco, advising the government on the sale and export of

tobacco, promoting and expanding the sale of tobacco, collecting statistics relating to tobacco, carrying out market research, controlling and regulating the sale of tobacco, licensing and registering tobacco growers and sellers, and lastly, defining tobacco grades and classes for the purpose of selling and buying. All marketing services are provided by Auction Holdings Limited (AHL) which is responsible for operating all the marketing floors. There are selling floors located in each of the three regions of the country, with the central region having two: Limbe auction floor in Blantyre, Southern Region; Kanengo and Chinkhoma auction floors located in Lilongwe and Kasungu districts respectively, in the Central Region; and Mzuzu auction floor located Mzuzu, in the Northern Region. The floors are usually open from mid-March to late October.

There are two types of tobacco farmers in Malawi, estate farmers and smallholder farmers. Estate farmers are composed of medium to large scale farmers who register and are licensed as individuals while smallholders are organized into farmer clubs which are affiliated to a farmer association. An association needs to have not less than 1500 registered growers or clubs (Tobacco Control Commission 2013). Some of the functions of the associations are to help the farmers in transporting their tobacco to the selling floors, provision of satellite depots and warehouses where the tobacco can be stored, advocating for policy changes for the farmers and facilitating access to credit. To pay for these services, the associations impose a levy on the gross sales of their registered farmers. The two largest farmer associations are Tobacco Association of Malawi (TAMA) and National Smallholder Farmers Association of Malawi, NASFAM (Chirwa 2011) but there are about eleven farmer associations that the Tobacco Control Commission approves (Tobacco Control Commission 2014). The farmers and/or clubs

register for production with the TCC before each growing season and they are allocated a quota for production, that is, the maximum number of kilograms each farmer/club can produce for the season. According to the Tobacco Control Commission (2014), there are a total of six buying companies in Malawi namely: Limbe Leaf, Alliance One, JTI Leaf, Premium Tama, Malawi Leaf and Associated Tobacco Company (ATC).

The types of tobacco grown in Malawi are Burley, Flue-cured, Northern Division Dark Fired (NDDF), Southern Division Dark Fired (SDDF), Oriental and Sun-air (Chirwa 2011). However, the past decade has seen more of a concentration on Burley, Flue-cured and NDDF, with Burley making up more than 90 percent of the total production (Chirwa 2011).

Tobacco production, just like production of most crops in Malawi, follows the rainy season that starts from November and lasts until around April. The seeds are first sown in nurseries and later transplanted into the field. It is a labor intensive crop that also requires a lot of chemicals to protect it from diseases and pests. Field activities such as topping and sucker removal require a lot of labor. Tobacco requires more fertilizer than most field crops. After the leaves mature, they are harvested in phases, starting from the bottom leaves moving upwards. Different types of tobacco are cured differently. Burley is hung in locally constructed barns with sticks and roofs thatched with grass while flue-cured is cured in rooms equipped with pipes that are heated. Dark-fired types are cured using smoke from wood fires. After curing, the tobacco is sorted into different grades according to leaf position, length and quality and then usually tied in groups of 4 to 8 leaves, which are then put it bales made with hessian cloth, weighing not more than 120 kgs. The bales are then transported to the auction floor for sale.

Recently Malawian tobacco farmers have been complaining about relatively low prices compared to tobacco prices in neighboring countries. Buyers have attributed the lower prices to compromised demand for the country's tobacco because of its relatively poor quality. The poor quality has been attributed to farmers' lack of adequate inputs.

In a move to ensure good quality tobacco leaf for international competition, to manage production, and also to ensure traceability of the tobacco (an issue raised by international tobacco buyers), the government in 2011 introduced the Integrated Production System (IPS). The goal of the IPS is to achieve an 80% to 20% ratio of contracted to non-contracted tobacco production in Malawi. Farmers under contract are usually provided with loans to purchase improved inputs (seed, chemicals, and fertilizer) and also benefit from the extension advisory services provided to them by their respective contractors. Contracted farmers must sell their tobacco to the buyer with whom they have contracted. Non-contracted farmers sell through the auction system. Table 1 indicates that since 2008, contracted sales have often achieved higher average prices as compared to the auction system.

Table 1.1 2008-2013 Annual Average Prices

Year	Auction	Contract
2008	2.39	2.32
2009	1.79	1.78
2010	1.73	1.94
2011	1.12	1.15
2012	2.04	2.05
2013	1.95	2.05

Source: Tobacco Control Commission 2013, prices are in USD

The Tobacco Control Commission of Malawi (2012) reports that in the year 2012, 67 percent of the tobacco was sold under contract while 37 percent was sold on the auction market. This leads to the question of why some farmers choose not to contract or choose to contract only a limited portion of their expected production. What factors influence these decisions? Since the effort to have this high percentage of tobacco farmers under contract is new, and not much has been studied concerning tobacco farmers in particular, this study is of great importance. Findings from this study will provide stakeholders with information about farmer perceptions of the contracting opportunities being promoted by the IPS.

1.1 Problem Statement

Malawi's smallholder tobacco sector has been characterized by poor quality, leading to low prices and low returns for tobacco farmers. The government approved and implemented the IPS, a system encouraging contract farming, in an effort to improve

quality (and thus prices received) and increase productivity. However, in the first year of the program's implementation, the target for the percentage of contracted production was not met.

1.2 Objectives

The main objective of this research was to determine the factors that influence tobacco farmers' decisions regarding how much of their expected production to contract. Specifically, the research looked at the following:

- Determining whether or not expectations regarding variability of yield influences farmers' contracting decisions.
- Determining whether or not access to inputs/loans influences farmers' contracting decisions.
- Determining whether or not price expectations influence farmers' contracting decisions.
- Determining whether or not yield expectations influence farmers' contracting decisions.
- Determining whether or not previous contracting experience influences farmers' contracting decisions.

Determining whether or not some demographic factors influence farmers' contracting decisions.

1.3 The Auction Market System

The term auction market system refers to farmers producing tobacco on their own, with their own resources, and selling the tobacco directly in the auction market. The

auction market is comprised of several buyers who compete by bidding for the tobacco at the same time and the highest bidder gets the tobacco.

As of the 2012/13 and 2013/14 marketing seasons, the auction market had two selling days and also two booking-for-delivery days per week, meaning that associations that transport tobacco to the auction floors had two days per week in which they could deliver the tobacco for the farmers. Each bale must have a tag with club name, registration number and the lot number for that particular consignment. When the tobacco has been delivered to the auction floor, it is stacked and assigned a date and a serial number, which are communicated to the owners, for identification on sale. On that particular selling day, the bales are organized according to their respective serial numbers, with bales from the same consignment following each other. A few hands of tobacco are sampled out of the bale and laid on top of the bale with a ticket that has all the bale's identification, in readiness for classification by Tobacco Control Commission classifiers. These classifiers then classify each bale with respect to the leaf position on the plant, quality and color of the tobacco, in readiness for the selling and buying team to do their business. Each class is linked to a minimum price set by the government. The selling and buying teams then come in, positioning themselves side by side of the tobacco row, the selling team on one side, and the buying team on the other. The selling team comprises a starter, an auctioneer, and a ticket marker, all officials from the Auction Holdings Limited. The buying team comprises a buyer from each of the buying companies. The sale starts by the starter shouting a starting price, usually the minimum price of the class assigned to the tobacco in a particular bale, then the auctioneer does his part while the buyers bid for the tobacco. Transactions on a bale last only a few seconds

and then they move to the next bale. The ticket marker puts the price at which the bale has been sold and the company that has bought that particular bale on the ticket. Then each company has its own classifiers who them classify their respective company's bales and also leaf checkers who come and check inside the bale to ensure that the tobacco inside is consistent with that which was displayed on top, and that it is free from other non-tobacco related materials. If they find any inconsistency, they open a case to be arbitrated upon by arbitrators from the TCC. Cases can be opened due to mixtures in quality, length, and also if the tobacco is taken to be too wet and not in good keeping condition. Tobacco that is found to contain foreign material such as plastics, is returned and sent to a commercial grader for rehandling. Finally, the arbitrator checks through all the bales with cases and then decides upon seeing the validity of the case, whether to return the bale for rehandling, reconditioning, or just re-offer, whereby the bale is just taken back to AHL's storage room to be assigned another day for sale. The proceeds of a farmer's sale are then processed and deposited to the farmer's bank account within a few days, usually three days.

1.4 Contract Marketing System

The contract or direct marketing system is where farmers agree to produce a specified volume of tobacco with a specific buying company, either by being assisted with an input loan or by themselves, and the tobacco is sold directly to that particular company. However the delivery and sale of this tobacco is also managed through the auction floors owned by AHL. According to The Gazette on Integrated Production System Guidelines (2014), some of the minimum contract terms required are: the agreed volume, commitments by the grower to sell and the tobacco buyer to buy the grower's

entire contracted crop within an agreed production variance of 10%, and the agreed price for each grade of tobacco, which shall be no less than the minimum price set and published by the Tobacco Control Commission. Contracts are one year renewable and according to the Gazette on Integrated Production System Guidelines (2014), failure to comply with the above commitments is liable to penalty of MK50, 000 for tobacco growers and MK500, 000 for tobacco buyers.

Tobacco buyers identify tobacco growers for contracts either on their own or through grower associations and then sign the contract agreement before the farmer registers for the season with the Tobacco Control Commission. The procedure from the farmer to the selling floor is quite similar to that of the auction marketing system thus the tobacco is sent through associations but in the contract marketing system, these associations are also bound by the agreement with the buyer company. As of the 2012/13 and 2013/14 marketing seasons, contract tobacco was sold three days per week and booking for delivery to the auction floors was also three days per week. Just like in the auction system, once the tobacco reaches the auction floor, it is assigned a date of sale and a serial number which are communicated to the owners. On the day of sale, the bales are laid on the floor according to their serial numbers and tickets with identification information are put on top of each bale. A few hands[1] are sampled out of the bale and laid on top of the bale and later classified by TCC classifiers. A buyer from the contracting company then comes and purchases the tobacco, taking into account the grade assigned by the classifier which also entails the minimum price below which he cannot buy. Once

[1] A hand is a group of tobacco leaves tied together by the stalk, in terms of leaf position, length and quality. These are then baled in hessian clothes.

the buyer has bought the tobacco, there come classifiers from the company and then leaf checkers to check for consistency of the quality of the bale and also check for some foreign material such as plastics. Bales found with foreign material are returned for rehandling. Those that are found to be inconsistent in quality are either sent for rehandling if found to be in that state by TCC arbitrators, or sometimes the arbitrator allows for the buyer to get the tobacco at a lower price, if the grower and the buyer agree to do so. After sales, the proceeds are deposited into the farmer's bank account after the buying company had deducted its loan, if the farmer was under sponsored production.

CHAPTER II

LITERATURE REVIEW

2.1 History of tobacco production in Malawi

Before liberalization of the Malawian tobacco industry, tobacco farming was a privilege to only estate farmers and tobacco marketing institutions were more adapted to the needs of these estate farmers (Zanit 2012). The tobacco industry was liberalized in the early 1990's, allowing smallholder farmers to grow tobacco. During this time, a logistical structure for tobacco transporting and marketing to address the needs of smallholder farmers was put in place (Zanit 2012). Farmer clubs were introduced during this period. A number of farmers between 10 and 30 sharing specific services such as extension services and transportation, were allowed to form a farmer club and register with the tobacco control commission where a quota was allocated to them. They were also entitled to receive seed, fertilizer and extension services. From 1991/92, farmer clubs were given authority to sell their tobacco directly at the auctions (Zanit 2012). This period saw the transformation of the industry to one dominated by smallholder burley producers. Farmer associations that already existed, together with some newly formed, helped with collection, storage, transportation and sale of smallholder farmers' tobacco.

2.2 Contract Farming

Contract farming or contract production is an arrangement between a grower and firm(s) with some conditions specified. They may either be marketing contracts or production contracts (Little and Watts 1994). Eaton and Shepherd (2001) also define Contract Farming (CF) as "an agreement between one or more farmers and a contractor for the production and supply of agricultural products under forward agreements, frequently at predetermined prices" (p. 2). In this agreement, the farmer commits to provide a specified commodity in quantities and at quality standards determined by the contractor, and the contractor also commits to support the farmer in the production of the commodity through provision of inputs and technical advice, and to purchase the commodity (Eaton and Shepherd, 2001). Usually, it is the contractor that initiates the establishment of a CF scheme. These contractors want to improve quality of the products supplied and also increase homogeneity in terms of quality on the products. Sometimes a CF scheme can also be initiated by government to promote critical commodity chains or by input suppliers who would like to expand input sales (Eaton and Shepherd, 2001).

Eaton and Shepherd (2001) explain 5 models of contract farming. The Centralized Model is where the processor buys produce from a large number of small farmers. In this model, there is strict control over quality and quantity is predetermined at the beginning of the growing season. This model is usually used in products that require a very high degree of processing. The Nucleus Model is slightly different from the centralized model. In addition to sourcing the product from independent farmers, the contractor also has its own production facilities such as an estate or plantation. The Multipartite Model is where there is involvement of a number of organizations, usually including a statutory body.

This can develop through farmers organizing themselves into cooperatives, or there might be involvement of a financial institution. The Informal Model is where individual entrepreneurs or small companies contract informally with farmers on a seasonal basis. Its success depends on the availability of support services such as research and extension from the government. Finally, the Intermediary Model is where a processor formally contracts with intermediaries who then informally contract with a number of small farmers.

Bijman (2008) describes three types of contracts. First is the Market-specification or marketing contract as "a pre-harvest agreement between producers and contractors on the conditions governing the sale of the crop/animal. Besides time and location of sales, these conditions include the quality of the product, thus affecting a few of the production decisions of the farmer. The contractor reduces the producer's uncertainty of locating a market for the harvest. Under the market-specification contract the farmer maintains most of the decision rights over his farming activities and thus his farm assets. Under this contract the farmer bears most of the risk of his production activities" (p. 5). The second type of contract is the Production-management contract which "gives more control to the contractor than the market specification contract, as the contractor will inspect production processes and specify input usage. Under this type of contract, producers agree to follow precise production methods and input regimes. Under the production-management contract, the farmer has delegated a substantial part of his decision rights over cultivation and harvesting practices to the contractor; he is willing to do so because the contractor takes on most of the market risks" (p. 5). Last is the Resource-providing contract, whereby the contractor provides a market outlet and also inputs (in kind or credit). The

credit is recovered upon product delivery. The resource-providing contract is the most prevalent for tobacco producers in Malawi.

2.2.1 Contract Farming in Malawi and Developing Countries

According to Prowse (2013), tobacco contracting in Malawi started in 2001-2002 when Stancom financed Press Agriculture to resume tobacco production on their estates. Press Agriculture has stopped producing tobacco in the year 2000. Later in 2002-2003, Limbe Leaf agreed with Press Agriculture to produce flue cured tobacco on 65 of their estates. It received orders from the president not to buy the tobacco through auction market but take it straight to its processing plant. However, it was alleged that these leaf companies under-declared their tobacco and also smuggled tobacco out of the country to avoid liabilities. For this reason, government made sure that starting from the 2003/2004 growing year, all tobacco that was financed by leaf companies should be sold through the auction floors but not on the usual auction system. It was during this time that companies such as Limbe Leaf and Dimon started contracting with smallholders. However, at that time, other types of tobacco apart from burley were the ones being sold on contract. Burley started to be bought on contract in 2007 (Limbe Leaf 2012).

Since the introduction of contract buying, there has been increasing pressures from international cigarette manufacturers for sustainable, sponsored, contract tobacco farming in Malawi. This is what led to the introduction of the IPS which would highlight issues of quality compliance, traceability, and sustainable production, just to mention a few (Limbe Leaf 2012). The IPS was approved and endorsed by the government and was implemented in the 2012/2013 tobacco growing/marketing season.

The importance of contract farming in developing countries cannot be overemphasized. Minot (1986) concluded that "contract farming is a successful means of supplying credit, inputs, technology information and market information to growers hence transferring production technology to the growers and also providing a more secure market outlet" (p. 71). He further states that "in almost all cases for which data are available, the implementation of contract farming schemes has resulted in significantly higher incomes for participating growers and there is a long waiting list of growers interested in participating" (p. 71). Barrett et al. (2012) state that contracting resolves market failures in insurance markets by providing insurance against price risk, provision of access to credit in financial markets; provision of access to inputs in input markets; provision of information in producing high-return, non-traditional commodities and the provision of agricultural extension services. They further state that "reduction in risk provides smallholder farmers with incentives to increase production (Baron 1970; Bellemare, Barrett and Just 2011) or to invest in yield-stabilizing technologies such as irrigation or yield increasing inputs such as fertilizer or improved varieties (Liu 2010; Michelson 2010)" (p. 719)[2].

2.3 Why Farmers Enter Into Contracts

Some studies have been undertaken to understand what really motivates farmers to enter into contracts and also take part in new technologies. Barrett et al. (2012) found that small scale farmers use contracting to solve the market uncertainty problems that they face. Masakure and Henson (2005) and Simmons (2002) found that small scale

[2] The page is from the journal in which the paper was published, see citation for journal details.

farmers also contract because they want to acquire indirect benefits such as training in improved production practices. Abara and Singh (1993) point out that level of expected benefits may also influence farmers to take part in new technologies. They state that programs that produce significant gains can motivate people to participate in new technologies and that without a significant difference in outcomes between two options and in returns from alternative and conventional practices, it is less likely that small scale farmers will adopt a new practice. Access to credit, sources of off-farm income, and membership in an organization are also some of the factors that influence smallholder farmers to enter contract farming (Masakure and Henson 2005; Barrett et al. 2012; Sharma 2008).

Smallholder farmers usually cannot afford improved inputs and they usually do not have access to credit from formal banks. Informal local lenders provide credit but usually at very high interest rates. Contracts give farmers access to credit so they can purchase improved inputs (Sharma 2008; Barrett et al. 2012; Simmons 2002). Sometimes observations from other farmers who are already under contract and benefited from the contract, will influence other farmers to enter into contracts because they also want the benefits that their friends acquired (Barrett et al. 2012; Masakure and Henson 2005).

Socio-economic and demographic factors such as age of farmer, level of education and farm size have also been found to be significant in explaining why farmers enter into contracts. Sharma (2008) found that contract farmers were younger, more educated, and had a larger farm size than non-contracted farmers. In his study looking at adoption of fertilizer and hybrid seeds by smallholder farmers in southern Malawi, Chirwa (2005) found that fertilizer adoption increased with the level of education, size of

the cultivated plot and level of non-farm income but decreased in female household headship. On the other hand, adoption of hybrid seed decreased with age. In other studies, such as Adesiina and Baidu-Forson (1995) and McNamara et al (1991), age has been found to positively related to adoption while Shapiro and Brorsen (1988), Musser et al (1996) and Sharma (2008) find age to be negatively related to adoption. Despite education being found to positively affect adoption as in Sharma (2008), Daku (2002) , Doss and Morris (2001), it has also been found to negatively affect adoption such as in Harper et al (1990) where higher education was negatively related to adoption of Integrated Pest Management insect sweep nets in Texas.

2.4 Econometric models used in farmer adoption studies

Several models have been used to model farmer adoption decisions. Smale et al. (1994) use the Heckman two step model in their study looking at land allocation to hybrid maize seed varieties. They compare the difference between testing a general land allocation model consisting of four nested models (competing explanations for partial land allocation to new and traditional seed varieties), and testing the nested models independently.

In examining farm characteristics that affect decisions to adopt marketing contracts, Katchova and Miranda (2000) used the two step procedure. They considered the quantity, frequency and contract type decisions conditional on the adoption decision and not estimating the decisions independently. They estimate the discrete decision of whether or not to adopt marketing contracts using a probit model and the other decisions of quantity, frequency and contract type decisions using tobit, poisson and multinomial logit models.

Davis et al. (2005) also used the Heckman two step procedure in analyzing forward pricing behavior of Indiana, Nebraska and Mississippi crop producers. They use the model to evaluate the effect of various socio-economic variables on the decision to forward price and the percentage of expected soybean and corn to be forward priced. First, they estimate a probit model to determine the effect of dependent variables on the probability of a respondent choosing to forward price soybean or corn prior to harvest. They use linear regression models to explain the effect of independent variables on the percentage of expected soybean or corn production that is forward priced. However, unlike the general Heckman two-step procedure, these people use the Maximum Likelihood estimation because the Heckman two-step procedure is consistent but not efficient (Greene, 1997 p.984).

CHAPTER III

CONCEPTUAL FRAMEWORK

The expected profit per hectare for a Malawian tobacco farmer is calculated as

$$E(\pi) = \{[E(\mathrm{P})E(\mathrm{Y})] + \mathrm{cov}(\mathrm{Y},\mathrm{P})\} - E(\mathrm{C}) \tag{3.1}$$

where π is profit, P is price, Y is yield, C is cost per hectare, and $E(\cdot)$ is the expectations operator. It is assumed that, a profit maximizing farmer will choose contracting or not contracting based solely on expected profit

$$\max_{NC,C}\left[E(\pi_{NC}), E(\pi_{C})\right] \tag{3.2}$$

where NC represents land allocation to non-contract production and C represents contract tobacco production.

But contracting may also affect the variance of profit. If this is the case, a simple profit maximizing model is no longer adequate to explain farmer decision-making. Koundouri (2006) in his study of farmer technology adoption, contend that an expected utility model is needed because technology adoption may influence both the expected profit and the variability of profits. Similarly, tobacco farmers in Malawi may be assumed to make contracting decisions according to the following objective function:

$$\max_{\gamma_{NC},\gamma_{C}}\left\{E\left[U\left(\pi_{\gamma_{NC}}\right)\right], E\left[U\left(\pi_{\gamma_{C}}\right)\right]\right\} \tag{3.3}$$

where U is utility,

$$E\left[U\left(\pi_{\gamma_{NC}}\right)\right]=E\left\lfloor U\left(\left(P_{\gamma_{NC}}Y_{\gamma_{NC}}-C_{\gamma_{NC}}\right),\sigma^2_{\pi_{\gamma_{NC}}}\right)\right\rfloor \tag{3.4}$$

is expected utility for not contracting and

$$E\left[U\left(\pi_{\gamma_C}\right)\right]=E\left\lfloor U\left(\left(P_{\gamma_C}Y_{\gamma_C}-C_{\gamma_C}\right),\sigma^2_{\pi_{\gamma_C}}\right)\right\rfloor \tag{3.5}$$

is expected utility for contracting.

The utility function is assumed to be twice differentiable, increasing in π, and decreasing in σ^2_π. Equation 3 shows that differences in expected prices, differences in expected yields, differences in expected costs of production or differences in risk between contracted and non-contracted production could influence farmers' contracting decisions.

However, according to Smale et al. (1994), farmers in developing countries do not fully adopt new technologies. They still allocate a portion of their land to traditional varieties, which in this case can be likened to non-contract farming which has been the farmers' usual way of producing tobacco. They discuss some explanations for land allocation to both new and traditional seed varieties and these explanations are: input fixity, portfolio selection and farmer learning. Following this, farmers' expected utility of profit can be given as:

$$E\left\lfloor U\left(\pi_{\gamma_C,\gamma_{NC}}\right)\right\rfloor=\gamma_C E\left[U\left(\pi_C\right)\right]+\gamma_{NC}E\left[U\left(\pi_{NC}\right)\right] \tag{3.6}$$

where γ_c and γ_{NC} are the percentages of hectares devoted to contract and non-contract production, respectively and the sum of γ_c and γ_{NC} is one.

Tobacco farmers usually have their expectations on the prices on the two selling systems, auction and contract (also called direct selling system). The price on the market can be affected by several factors. First is supply for the tobacco. If there is oversupply, prices are low, but farmers have more ability to negotiate for higher prices in the contract market than they do on the auction floor. There is also some degree of direct involvement by the farmers in the contract sale in that they can sometimes negotiate for a slightly higher price on their tobacco if they feel it has not been awarded a price it deserves. After the buyer has allocated a price to a particular bale, the farmer can appeal/negotiate for an increase through their farmer representatives from their respective farmer associations.

Secondly, smallholder farmers usually do not have sufficient personal wealth to purchase the improved inputs that would increase yields. Furthermore, they do not usually have access to credit from banks to buy the inputs. Hence they may be attracted to contracts because contracts may be a lower cost means of obtaining loans than going to a bank or an informal lender.

The number of selling days for each market will also affect farmers' decision regarding contracting. With the IPS system, contract production has more offloading and selling days than auction-sold production. For the auction tobacco, the stacked bales usually accumulate into a large amount before it goes on the floor, and even on the selling day, some of it has to be carried over to another day because of the limited space and the required allocation to be sold per day. This increases the cost to farmers as they usually incur additional travel and accommodation expenses if the selling date of their tobacco has been shifted.

The rejection rate is also another market factor that may influence contract decisions. Bales are rejected when buyers choose not to pay the specified minimum price for the grade of tobacco contained in the bale. This may be because the buyer believes the bale has been incorrectly graded or for some reasons known to the buyers themselves. Sometimes, the buyers have specific qualities that they prefer, according to the orders from their clients, hence the other qualities face higher rates of rejection at that particular time. Tobacco that has been rejected may experience quality losses over time resulting in a lower realized price. The auction market generally has much higher rejection rates than the contract market. Farmers may therefore, choose to contract to minimize the risk of their tobacco facing several rejections before being bought. Rejection will also increase costs to farmers because they have to commute to the selling floor for a number of times, and sometimes even spend a number of nights waiting for their tobacco to be sold.

There are more steps taken to register for contract farming than non-contract marketing. Apart from the process at the Tobacco Control Commission, those registering for a contract will undergo further assessments by the company from whom they are seeking a contract. This will increase farmers' costs since they have to travel several times to complete the registration process. These travels impose direct costs as well as opportunity costs in the form of other activities left undone. Registration occurs at the same time that farmers are preparing their fields through to nursery establishment.

Some farmers see the potential to acquire technical knowledge on the crop they are growing and also a new crop, in contract farming (Masakure and Henson 2005; Simmons 2002). This is because of the technical advice usually provided in most

production contracts, and is also provided in tobacco contracts in Malawi. And this knowledge might affect yield.

Observations from other farmers who are already under contract and benefited from the contract, will also influence some farmers to go under contract because they also want the benefits that their friends acquired (Barrett et al. 2012; Masakure and Henson 2005). Contracting, therefore, might increase their expectations on profit.

There are also some other factors that are not explained in the conceptual model but may influence farmers' decisions regarding contracting. Socio-economic and demographic household characteristics have also been found to influence farmers' decision regarding contracting. Among these are the age of the farmer, the farmer's level of education and farm size. Figure 3.1 below is a diagram of the conceptual framework of the study.

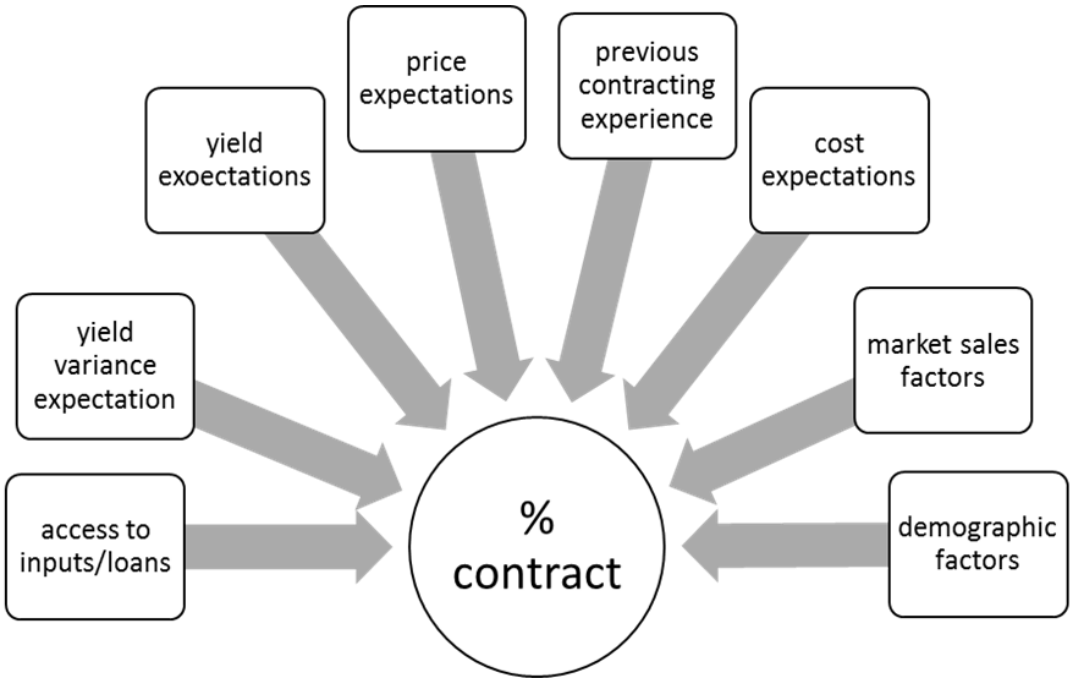

Figure 3.1 Conceptual Framework

CHAPTER IV

DATA AND METHODS

4.1 Survey Design and Implementation

Before the survey was approved by the International Review Board (IRB) before it was carried out (see appendix for details). The researcher and all that were directly involved in it were certified by the board, as per requirement before handling human subjects in research studies.

Primary data were used and were collected using a structured questionnaire. The data were collected from three districts, Lilongwe, Kasungu and Dowa, from the central region of Malawi. The central region is the largest tobacco producing region in Malawi. Kasungu and Dowa are two of the largest tobacco producing districts in Malawi, they together account for about 40 percent of the total tobacco production (Zanit 2012). Lilongwe is also a major tobacco producing district.

A random sample of 100 farmers were interviewed from each district, thus a total of 300 tobacco farmers were interviewed in-person using a questionnaire.

Data were collected in October and November of 2014. This time was chosen because it is when farmers make contracting decisions. By this time most of the farmers had already registered with the Tobacco Control Commission for their forthcoming selling season, though some were still in the process of registration. This was also a convenient time for data collection because farmers had not yet started preparing their

nursery gardens for the tobacco and hence they were easily found in their homes. Had they already started their nursery preparation, they would not be at home and it would have been very difficult to interview a considerable number of respondents in a day.

4.1.1 Survey Questionnaire

The questionnaire had five sections. The first section comprised screening questions meant to screen out respondents who had never produced tobacco and those who had produced tobacco but were not the major decision maker in the household regarding tobacco production. The section also had questions aimed at capturing the respondent's land holding size and the allocation to tobacco production, and also the percentage of land allocated to contract farming from the total tobacco acreage.

The second section comprised questions about non-contracted tobacco production. The questions captured the respondent's expectations on yield, expectations on input costs, price expectations and also expectations on market features such as rejection rate, tobacco delivery and selling time.

The third section was for respondents who planned to produce some tobacco under contract in the upcoming growing season. It had questions that captured the respondent's expectations on contract farming yield, input costs, prices and also expectations on other market features.

For respondents who were not planning to produce any tobacco under contract in the upcoming growing season the fourth section consisted of questions that were similar to those in the third section in that they were designed to elicit these growers' perceptions of contract farming. The questions had to be worded a little differently than those in the

third section because these growers were not intending to produce tobacco under contract.

The last section had questions meant to capture household demographics, tobacco farming experience, wealth, and contribution of tobacco to the household's income.

4.1.2 Sampling

A sample of 100 farmers were randomly selected from each district, thus a total of 300 tobacco farmers were interviewed in-person using a questionnaire. All Extension Planning Areas (EPAs) from each of the three districts were obtained from the Tobacco Control Commission and two EPAs were randomly selected from each district. Chitekwere and Nyanja EPAs were selected from Lilongwe district, Mponela and Nambuma EPAs were selected from Dowa district and Santhe and Chipala EPAs were selected from Kasungu district. Names of farmer clubs from each of the EPAs were obtained and ten clubs were randomly selected from them. And finally, five farmers from each club were randomly selected and interviewed using a questionnaire.

4.1.3 Questionnaire Administration

Before the actual administration of the questionnaire, the instrument was pre-tested, with each interviewer conducting five interviews. The pre-test took place at the Tobacco Control Commission office at Kanengo in Lilongwe whereby a few farmers from those who come to register for the growing season were interviewed. The farmers that agreed to help in this exercise were assisted with being prioritized in the registration process.

Having selected the farmers from each of the three districts, arrangements were made with the government's ministry of agriculture office in each of the three districts, whereby an Agricultural Extension Development Coordinator (AEDEC) was contacted and asked to help with mobilizing the selected farmers from his/her area and arranging for a day when the farmers would come at a strategic venue where the interviews were conducted. One venue from each EPA was selected. On the interview day, at a particular venue, a group of thirty farmers were staggered at a one and half hour interval as they would have to wait for a long time to get interviewed if they all came at once. Each interviewer then chose a convenient spot, where no other third person would overhear the conversation between him/her and the respondent. The interviews took on average, forty minutes to complete and an average of thirty farmers were interviewed per day. After an interview, the farmers were provided with some refreshments and snacks.

4.2 Descriptive Statistics

Tables 4.1 through 4.4 show some of the descriptive statistic findings, and the actual questions from which the results were obtained can be viewed from the questionnaire in the appendix section. The average age of the respondents was 40. This varied a little by district with the average age of respondents in the Lilongwe, Dowa and Kasungu Districts being 43, 38 and 40 respectively. The average landholding size for the sample was 2.8 hectares and the average land area allocated to tobacco was 0.95 hectares, with Lilongwe District having the lowest average area grown with tobacco. However, despite Lilongwe tobacco farmers allocating relatively a smaller proportion of their land to tobacco production, farmers in the district relatively allocate the highest proportion to contract tobacco production.

On average, 73 percent of total household income was from tobacco. Lilongwe District had the lowest percentage income from tobacco and Dowa District had the highest. This is likely because Lilongwe District contains a large urban area and thus has more nearby opportunities for non-agricultural activities. This is also reflected in the fact that respondents from Lilongwe District reporting having the highest average percentage of income from non-agricultural sources among the three districts. Dowa is the least developed among the three districts and also shows the lowest percentage average income from non-agricultural sources.

The questionnaire results show that tobacco production is male dominated. Of those who indicated that they were the primary decision maker in the household regarding tobacco production, 99 percent were male. In terms of education, about 93 percent of the total sample attended at least primary school, with the majority, about 69 percent, having received only a primary school education.

As expected, the questionnaire results indicate that producers expect production costs for seed, fertilizer and pesticides to be higher for contract production than for non-contract production. Likewise, the results also show higher expected yields for contract production than for non-contract production. This might be because in contract farming, the farmers are provided with the required inputs in the recommended quantities as opposed to non-contract production where farmers buy their own inputs, and since most farmers do not have the capacity to buy the inputs in the recommended quantities, they expect to use less inputs per hectare. The higher expected yields in contract production is likely due to the adequacy of inputs and also the technical assistance provided by the contracting companies to their farmers.

In terms of output market price expectations, it is also interesting to note that expectations on all the prices (average, highest and lowest) were higher for the contract market than the auction market. This is also consistent with results related to negotiation ability. More than 80 percent of the sample believe that they will be able to negotiate for a price increase at the contract market while more than 74 percent think they are less likely to negotiate for a price increase at the auction market. The expectation on the rejection rates per selling day is higher on the auction market, as expected, with the mean expectation being 31 percent. Only 8 percent of the bales are expected to be rejected per day on the contract market. This is also in line with the expectations on negotiation ability, as in the contract market, growers sometimes agree to a price compromise so that their bales (that were initially rejected by the contracting company buyer) should be bought.

In describing how respondents have viewed their fellow farmers' contracting experience, 58 percent of the total sample viewed other farmers' contracting experience as at least positive while 19 percent viewed others' contracting experience as at least negative.

Contrary to expectations, the results indicate that the farmers expect to incur less number of trips for contract registration than the non-contract registration.

On expectations on loans, the farmers are would expect to get a larger loan from the bank as compared to what they would expect to borrow from informal money lenders. The maximum they would expect to borrow from the bank is MK 238, 000 while they would expect to borrow MK 66, 000 which is close to four times less the maximum bank loan, from informal money lenders. Farmers expected to pay a lower interest rate on the

expected bank loan than on informal money lenders' loans. The mean expected interest rate on bank loan is 31 percent and that on informal lenders' loans is 83 percent. The mean expected interest rate on the contract loan is 41 percent.

Table 4.1 below shows summary statistics for continuous demographic variables. Landholding size is the total land area for all crop production, tobacco area is the total land area allocated to tobacco production while "% tobacco area" is the percentage of land allocated to tobacco on total landholding size and was computed by responses from question 4 by responses from question 2 in questionnaire (see appendix). "% contract area" is the percentage of land allocated to contract tobacco production, on the total land area allocated to tobacco production and was computed by dividing responses from question 5 by responses from question 4 in questionnaire (see appendix). "% non-agricultural income" is the percentage of annual income from off-farm activities, on the total estimated household annual income and was computed by dividing the responses from question 54 by responses from question 53 in questionnaire (see appendix). "% tobacco income" is the percentage of the income from that comes from tobacco proceeds, on the total estimated annual household income and was computed by dividing the responses from question 55 by responses from question 53 in the questionnaire (see appendix).

Table 4.1 Summary statistics for continuous demographic variables

VARIABLE	**TOTAL (N=300)**	**LILONGWE (n=100)**	**DOWA(n=100)**	**KASUNGU (n=100)**
	Mean	Mean	Mean	Mean
Age	40.52 (13.27)	43.34 (13.05)	37.69 (11.70)	40.52 (14.44)
Household Size	6 (2.71)	6 (2.15)	6 (2.40)	7 (3.39)
Landholding Size (Ha.)	2.83 (2.57)	1.70 (0.98)	3.29 (2.35)	3.50 (3.39)
Tobacco Area (Ha.)	0.95 (0.86)	0.45 (0.30)	1.18 (0.82)	1.21 (1.04)
% Non-Agricultural income	22.00 (19.59)	26.02 (21.12)	19.10 (19.51)	20.89 (17.53)
% Tobacco Income	73.27 (59.90)	63.73 (20.77)	84.02 (82.72)	71.96 (17.71)
% Tobacco Area	35.26 (15.40)	29.05 (14.16)	38.36 (14.19)	38.38 (15.99)
% Contract Area	46.69 (48.40)	63.40 (46.62)	38.12 (46.82)	38.38 (47.76)

In parentheses are standard deviations

Table 4.2 below shows summary statistics for non-continuous demographic variables. None, primary, JC, MSCE and tertiary are categories of education level representing respondents that did not attend school, reached up to primary school level, reached up to junior secondary school level, reached up to senior secondary school level, and reached up to tertiary education level, respectively. “%yes” refers to the percentage of respondents that agreed to possessing the specified (wealth measure) item. 48 percent of the tobacco farmers possess at least an iron-roofed house, 92 percent possess at least a bicycle, 80 percent possess at least a cellphone, 28 percent possess at least an ox-cart, 15 percent possess at least a motorcycle and 15 percent possess at least a television set. These statistics do complement the view that tobacco farming does improve the wealth and status of farmers.

Table 4.2 Summary statistics for non-continuous demographic variables

VARIABLE		TOTAL	LILONGWE	DOWA	KASUNGU
Gender (%)	Male	99	98.0	100	99.0
	Female	1.0	2.0	0.0	1.0
Education level (%)	None	7.0	11.1	3.0	7.0
	Primary	69.0	77.8	72.0	59.0
	JC	14.0	5.0	14.0	22.0
	MSCE	9.0	6.1	11.0	10.0
	Tertiary	0.7	0.0	0.0	2.0
Iron roof house (%yes)		48.0	58.6	40.0	47.0
Car (%yes)		3.0	1.0	7.0	1.0
Oxcart (%yes)		28.0	24.2	24.0	35.0
Motorcycle (%yes)		15.0	6.1	21.0	19.0
Bicycle (%yes)		92.0	94.9	88.0	92.0
TV set (%yes)		15.0	15.1	16.0	14.0
Cellphone (%yes)		80.0	69.7	84.0	85.0

"%yes" refers to the percentage of respondents that agreed to possessing the specified (wealth measure) item.

Table 4.3 Summary Statistics for Yield, Price and Cost Expectations

VARIABLE	TOTAL	LILONGWE	DOWA	KASUNGU
Auction price (USD)	2.04 (0.49)	2.11 (0.56)	1.94 (0.43)	2.07 (0.52)
Highest auction price (USD)	2.55 (0.48)	2.55 (0.46)	2.52 (0.44)	2.59 (0.53)
Lowest auction price (USD)	1.39 (0.53)	1.48 (0.53)	1.25 (0.47)	1.45 (0.58)
Contract price (USD)	2.31 (0.59)	2.47 (0.74)	2.16 (0.47)	2.31 (0.49)
Highest contract price (USD)	2.77 (0.62)	2.86 (0.89)	2.71 (0.37)	2.76 (0.47)
Lowest contract price (USD)	1.76 (0.65)	1.94 (0.78)	1.52 (0.47)	1.82 (0.59)
Non-contract seed cost/ha (MK)	4890 (7441.77)	5894 (8412.97)	4545 (6596.73)	4242 (7180.95)
Non-contract fertilizer cost/ha (MK)	167864 (90342.48)	187824 (102583.18)	149423 (82407.95)	166545 (81338.61)
Non-contract pesticide cost/ha (MK)	16005 (23276.43)	22107 (32142.06)	10866 (12732.51)	15470 (20679.80)
Non-contract yield/ha (Kgs)	1769 (854.86)	1877 (932.06)	1623 (779.79)	1810 (834.70)
Non-contract highest yield/ha (Kgs)	2313 (1696.31)	2619 (2542.82)	2065 (945.41)	2259 (1099.44)
Non-contract lowest yield/ha (Kgs)	1249 (652.33)	1280 (676.37)	1154 (636.90)	1315 (638.65)
Contract seed cost/ha (MK)	46597 (144453.71)	56544 (190044.81)	22589 (68753.79)	51912 (103916.09)
Contract fertilizer cost/ha (MK)	245952 (150884.53)	279667 (154998.75)	217685 (161970.61)	210140 (108080.25)
Contract pesticide cost/ha (MK)	31942 (44886.75)	47310 (60811.62)	18057 (21989.16)	23199 (20188.42)
Contract yield/ha (Kgs)	2288(1134.61)	2670 (1303.42)	1883(924.26)	2028(754.05)
Contract maximum yield/ha (Kgs)	2739 (1410.92)	3210 (1577.94)	2252 (1308.81)	2406 (862.94)
Contract lowest yield/ha (Kgs)	1676 (869.42)	1891 (1014.85)	1404 (724.59)	1577 (614.88)
Contract seed cost for non-contract farmers (MK)	15549 (53949.47)	25878 (93181.91)	9076 (6721.64)	16787 (53831.07)
Contract fertilizer cost for non-contract farmers (MK)	259058 (132015.56)	267006 (133420.66)	256703 (129995.81)	257577 (135474.15)
Contract pesticide cost for non-contract farmers (MK)	27234 (24791.94)	31083 (31221.73)	21449 (16481.11)	30708 (27024.02)
Contract yield/ha for non-contract farmers (Kgs)	2487 (997.09)	2585 (984.25)	2353 (991.59)	2570 (1010.02)
Contract highest yield/ha for non-contract farmers (Kgs)	3108 (2393.19)	3116 (1076.53)	3249 (3559.23)	2965 (1137.69)
Contract lowest yield/ha for non-contract farmers (Kgs)	1799 (834.62)	1841 (839.04)	1680 (881.82)	1896 (781.98)

In parentheses are standard deviations

Table 4.4 Summary statistics for other variables

VARIABLE	TOTAL	LILONGWE	DOWA	KASUNGU
Expected maximum bank loan (MK)	238043 (358299.30)	89625 (72621.61)	326324 (356865.84)	358593 (515831.98)
Expected bank loan interest rate (%)	30.7(22.43)	26.9(24.81)	38.7(23.36)	29.7(13.83)
Expected maximum informal lender loan (MK)	65971 (74800.96)	43362 (55331.19)	80660 (89184.54)	73861 (68288.11)
Expected informal lender loan interest rate (%)	83.2(40.49)	67.3(33.85)	90.0(40.97)	93.5(42.44)
Expected auction rejection rate (%)	31 (22.86)	20 (17.86)	38 (21.97)	35 (24.44)
Expected contract interest rate (%)	41.1 (47.16)	40.9 (55.82)	37.7 (19.50)	56.0 (62.22)
Expected contract rejection rate (%)	7.8 (41.44)	4.7 (6.4)	12.7 (70.57)	6.0 (7.87)
Trips to register auction (trips)	3	4	3	4
Trips to register contract (trips)	2 (1.77)	2 (1.44)	1 (0.99)	2 (1.30)
Cost per trip to registration (MK)	4077.5	4497.7	2952.5	4833.0
Years growing tobacco (years)	10 (8.55)	7 (5.15)	12 (9.55)	12 (9.20)
Negotiation ability auction				
Somewhat likely	18.1	23.2	14.0	17.0
Very likely	8.7	11.1	10.0	5.0
Unlikely	54.5	45.4	58.0	60.0
Very unlikely	18.7	20.2	18.0	18.0
Negotiation ability contract				
Somewhat likely	38.5	26.8	47.0	41.4
Very likely	42.6	41.2	42.0	44.4
Unlikely	13.8	22.7	10.0	9.1
Very unlikely	5.1	9.3	1.0	5.0
Others experience in contract				
Negative	14.7	22.2	9.0	13.0
Neutral	19.7	12.1	24.0	23.0
No knowledge	3.0	8.1	0.0	1.0
Positive	21.4	18.2	22.0	24.0
Very negative	3.7	7.1	1.0	3.0
Very positive	37.5	32.3	44.0	36.0

In parentheses are standard deviations

A simple net return expectation (tables 4.5, 4.6, 4.7 and 4.8) for each farmer was calculated using the following formula:

$$\pi_i = P_i * \mathrm{Y}_i - \left\{ SC_i + FC_i + PC_i + \left(trips_i * \cos t / trip \right) \right\} \tag{4.1}$$

where π_i is expected net return for each production system. P_i and Y_i are expected price and expected per hectare yields respectively, for each production system. For these variables, farmers were asked to state their highest, median and lowest expectations from which the mean was calculated. SC_i , FC_i and PC_i are expected per hectare seed costs, fertilizer costs, and pesticide costs respectively for each production system. $trips_i$ and $\cos t / trip$ are expected number of trips to complete the registration process and expected estimated cost per each trip, respectively for each production method. For tables 4.5 and 4.6, all farmers, those that intended to contract and those that did not intend to contract, were asked to state their expectations on non-contract production. They all were asked to state their expectations if they produced non-contracted tobacco on the plot they allocated to tobacco production (see questions 7-22 in questionnaire). For table 4.8, farmers that did not intend to contract were asked to state their expectations such as highest, median and lowest price and yield expectations for contract production (questions 30-43). The results show that the mean net return expectations are higher for contract tobacco production than for non-contract production. Interestingly, even those respondents who stated that they did not intend to produce contracted tobacco in the upcoming growing season had higher net return expectations for contract production, and very much interesting, is that they even had higher net return expectation for contract production than those who intended to produce under contract (tables 4.7 and 4.8). Clearly this shows that these farmers are not driven by net return expectations in their contracting decisions. Perhaps these farmers are concerned about their financial risk in that they

would still be required to repay the input loan from contracting companies in case some unforeseen factor such as drought occurs and they have little proceeds from tobacco. They may also be concerned about the production risk of growing a new tobacco seed varieties which need more attention than the traditional varieties which they are used to. This might also lead to them producing inferior quality tobacco and probably low yields hence also leading to the financial risk described above. Maybe these farmers just don't trust the contracting companies or the legal system, in case they end up with a case against the contracting companies. Maybe they have no previous experience with any kind of contract so they are afraid of what might be contained in the "small print" of a contract. It might as well be that these farmers have seen a fellow farmer who had contracted encounter a negative experience and they are afraid that they would encounter a similar experience. In short, if these farmers are risk averse, they may just be more inclined to stick to the auction system which they know and understand better.

Table 4.5 Expected net return matrix for non-contract tobacco production for respondents who did not intend to produce contracted tobacco

		Output price		
		HIGH	MEDIUM	LOW
Yield	HIGH	2,289,661	1,797,116	1,205,101
	MEDIUM	1,658,111	1,271,367	830,464
	LOW	1,136,375	864,835	549,570

Figures are in Malawi Kwacha (MK) where MK 400 = 1 USD

Table 4.6 Expected net return matrix for non-contract tobacco production for respondents who intended to produce contracted tobacco

	Output price		
	HIGH	MEDIUM	LOW
Yield HIGH	2,068,914	2,617,751	982,783
Yield MEDIUM	1,615,340	2,123,838	746,667
Yield LOW	1,029,584	1,583,478	448,104

Figures are in Malawi Kwacha (MK) where MK 400 = 1 USD

Table 4.7 Expected net return matrix for contract tobacco production for respondents who intended to produce contracted tobacco

	Output price		
	HIGH	MEDIUM	LOW
Yield HIGH	2,645,386	2,241,888	1,522,834
Yield MEDIUM	2,137,955	1,798,264	1,209,110
Yield LOW	1,463,358	1,224,167	800,853

Figures are in Malawi Kwacha (MK) where MK 400 = 1 USD

Table 4.8 Expected net return matrix for contract tobacco production for respondents who did not intend to produce contracted tobacco

	Output price		
	HIGH	MEDIUM	LOW
Yield HIGH	3,246,847	2,628,482	1,872,613
Yield MEDIUM	2,476,664	1,979,489	1,369,067
Yield LOW	1,766,192	1,396,286	949,613

Figures are in Malawi Kwacha (MK) where MK 400 = 1 USD

4.3 Econometric Estimation

4.3.1 Estimating Equations

Data were analyzed using SAS and Stata software. The logit methods was used to estimate one equation. The equation estimates the percentage of land allocated to contract production which can be given as:

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_1 + \beta_2 X_i + u_i \tag{4.2}$$

where $P_i = \Pr\left(Y_i = Yes / X_i\right)$ is probability of choosing to contract, $\left(Y_i = Yes / X_i\right)$ and X_i is a vector of explanatory variables. A linear mean-variance approach is used rather than an explicit utility function form. Farmers' objectives can be expressed in terms of their yield expectations and perceptions of relative yield variance (Smale et al., 1994).

The expected value of per hectare profit from tobacco production is per hectare total revenue less total costs which include fertilizer cost (the primary cost), seed cost, and cost of trips to registration.

Unlike in Smale et al. (1994) where output price ratio was used, prices were treated separately because even though the official government minimum prices are the same, differences in expected prices were observed between auction and contract market farmers.

Contracting experience is expressed by a variable that measures how many years the farmer had contracted at least some of their land, apart from the current growing season. This measures the influence of learning by doing on allocation of land to contract tobacco production (Smale et al., 1994).

Table 4.9 Measured Variables

Dependent Variable	**Description**
P_c	Probability of contracting
Explanatory Variables	**Description**
Price_contract	Expected price per kg contract tobacco (USD)
Price_auction	Expected price per kg non-contract tobacco (USD)
Contfertperha	Expected fertilizer cost for contract production
noncontfertperha	Expected fertilizer cost for non-contract production
yield_contract	Expected yield contract production
newyield_nc	Expected yield non-contract
var_ratio	Ratio of variances computed from yield distributions
years_tobacco_pdctn	Number of years the farmer has previously contracted
years_prev_grwn	Number of years the farmer has been producing tobacco
expctd_rejctnrate_au	Expected daily contract market tobacco rejection rate
Income_fromnonagrics	Estimated annual income from non-agricultural sources
Education level (4 dummies)	The highest level of education reached by farmer
Negotiatn_ability_auction (4 dummies)	Likelihood of negotiating for a price increase on auction
Negotiatn_likelihood_contct (4 dummies)	Likelihood of negotiating for a price increase on contract

4.3.2 Variable Measurement

Table 4.8 above shows the empirical measures for the variables defined in the above section. The binary Yes/No dependent variable was derived from the transformation of the percentage land allocated to contract tobacco production variable, which was computed from measured areas for contract tobacco and that of all tobacco. Expected output prices were elicited from farmers when they had just started the

production process. Expected fertilizer costs were used because they are the main cost in the tobacco production and were elicited from farmers. The variable years_prev_grwn is the number of years the farmer has contracted at least some of their tobacco, not including the survey season, as reported by farmers and the variable years_tobacco_pdctn is the total number of years the farmer has been producing tobacco. These were elicited from farmers.

Expected yields and yield variances were computed from farmers' expected yields which were elicited as a set of triangular yield distributions. Just as in Smale et al. (1994), farmers were asked to state the minimum, maximum and modal yield they expected to obtain from a given plot for each production system. Yield was computed by dividing the output estimates by area of the plot.

The expected rejection rates per selling day, "expctd_rejctn_contra" and "expctd_rejctnrate_au" were elicited from farmers as number of bales they expected not to be sold per a hundred-bale row. Estimated total annual incomes, income from non-agricultural sources, landholding size, age, and education level were elicited from farmers.

4.3.3 Estimation Procedure

There is one equation estimated. The equation concerns the percentage of land allocated to contract production and is estimated using logit regression. Since the results showed that there was a very small number of observations that had allocated between zero and hundred percent to contract, thus, a huge majority of the observations either contracted all or not any of their land. The dependent variable "percent contract" was

transformed to a 0, 1 only variable, thus all observations less than 0.5 were classified as 0 and those greater than 0.5 were classified as 1.

CHAPTER V

RESULTS

5.1 Land allocation to contract tobacco production

From the analysis of factors influencing the probability of contracting, table 5.1, the Hosmer and Lemeshow test shows that the model correctly predicts the variations in the responses and twelve variables were found to be significant at, at least, 10 percent significance level. The results are summarized in table 5.2. As anticipated, expected auction price (price_auction) is found to be negatively related to adoption of tobacco contract production, thus, increases in the expected auction market price reduces the likelihood of adoption of tobacco contract farming. Expected contract market price is found to be positively related to adoption of contract tobacco production, just as anticipated. Thus, an increase in the expected contract market price also increases the likelihood of adoption of tobacco contract farming. Expected contract production fertilizer cost (contfertperha) and expected non-contract production fertilizer cost (noncontfertperha) were found to negatively and positively affect adoption of contract tobacco production, respectively. Expectation of ability to take a loan from an informal money lender (inflender_nc) was found to positively affect adoption of tobacco contract farming. Thus farmers that expected to be able to take a loan from an informal money lender were more likely to adopt a tobacco farming contract than those that did not expect to be able to take a loan from the mentioned source. This finding is contrary to what was

expected. It was thought that some farmers were contracting because they could not get a loan to purchase inputs, but it seems this is not the case. This could be that those that expected to take informal lender loans were not afraid to take loans hence also more likely to contract to obtain the input loans. Expected tobacco rejection rate per auction market selling day (expctd_rejctnrate_au) was also significant. However, the sign of its parameter estimate was not as anticipated as it was found to be negatively related to adoption of a tobacco contract, meaning that an increase in the expected rejection rate for the auction market decreases the likelihood of a farmer taking a tobacco farming contract. Perhaps this can be that these farmers have high hopes of the tobacco selling at a better price the next time it comes back on the market after it was initially rejected. Since the farmers do not have the chance for negotiations on the auction market, and in negotiating they sometimes compromise on price in cases where their tobacco was found to be faulty in terms of presentation in the bale[3], these farmers probably do not want to compromise on the selling price. Two dummies for expectation on negotiation ability in the auction market were found to be significant. A dummy for those that thought it somewhat likely that they would be able to negotiate for a price increase and those that thought it unlikely that they would be able to negotiate for a price increase in the auction market were found to be less likely to adopt contracting. Very unlikely to be able to negotiate for a price increase was the reference, which means that those that thought it somewhat likely that they would be able to negotiate for a price increase in the auction market are less likely to take a tobacco production contract than those who thought it very unlikely that they

[3] Faulty presentation is such as bad mixtures in quality, length and leaf positions, which are outside the accepted standards for bale presentation. Bales with bad mixtures are returned for re-handling.

would be able to negotiate for a price increase in the auction market. Likewise, those that thought it unlikely that they would be able to negotiate for a price increase in the auction market are less likely to take a tobacco production contract than those that thought it very unlikely to negotiate.

On the demographic variables, experience in contract tobacco production (years_prev_grwn), experience in tobacco production (years_tobacco_pdctn), income from non-agricultural sources (income_fromnonagrics) and a dummy for those that reached junior certificate level of education (JC) were significant at 10 percent. Number of years the farmer had contracted before was found to be positively related to contract adoption, thus as the number of years of contract production increased, the likelihood of the farmer contracting also increased. However, number of years in tobacco production was found to be negatively related to adoption thus, as the number of years in tobacco production increased, the likelihood of the farmer contracting decreased. Estimated annual income from non-agricultural sources (income_fromnonagrics) was found to positively affect contracting, thus those that had higher income from non-agricultural sources were also more likely to contract. And lastly, a dummy for those that reached junior certificate level of education was found to be negative, meaning that those that had this level of education were less likely to contract as compared to those that had reached primary school education (prim) which was the reference category.

5.2 Other findings

Apart from the findings from econometric estimation, other observations were made in the course of survey interviews.

It was found that farmers do not know the actual monetary value of their input loans they obtain from contracting companies, the price at which they were given the inputs, and also the actual interest rates on the loans. These issues are not specified in the contract agreement document.

Table 5.1 Maximum Likelihood estimates for contract adoption equation

Variable	Estimate	Std error	Wald	P-value	Marginal effect
Intercept	2.2299	1.1732	3.6127	0.0573	
price_auction	-1.8624	0.5086	13.4073	0.0003	0.3142511***
price_contract	1.0700	0.4428	5.8398	0.0157	0.1805509**
noncontract fertilizer cost	9.771E-6	3.089E-6	10.0040	0.0016	1.6487223E-6***
contract fertilizer cost	-3.63E-6	1.711E-6	4.5067	0.0338	-6.128073E-7*
yield non-contract	-0.0443	0.0387	1.3117	0.2521	-0.0074794
yield_contract	-0.00113	0.0286	0.0016	0.9685	-0.000190756
informal lender loan	0.7062	0.3315	4.5390	0.0331	0.1191556*
contracting experience	0.6571	0.1242	27.9802	<.0001	0.1108826***
years_tobacco_pdctn	-0.0463	0.0194	5.6686	0.0173	-0.0078081**
yield variance ratio	-0.0407	0.0505	0.6486	0.4206	-0.0068639
off-farm income	1.818E-6	1.025E-6	3.1456	0.0761	3.0675441E-7*
no education	-0.4406	0.6672	0.4362	0.5090	-0.0743496
Junior secondary school	-0.9269	0.5295	3.0643	0.0800	-0.1563994*
MSCE	-0.3356	0.5781	0.3369	0.5616	-0.0566187
Tertiary education level	-17.8412	1227.4	0.0002	0.9884	-3.0103986
auction rejection rate	-2.2960	0.8371	7.5236	0.0061	-0.3874067***
V. likely to negotiate_auc	-0.6411	0.6886	0.8667	0.3519	-0.1081720
somewhat likely_auction	-1.0774	0.5609	3.6894	0.0548	-0.1818003*
unlikely to negotiate_auct	-1.6085	0.4606	12.1946	0.0005	-0.2714009***
somewhat likely_contract	-0.1623	0.3708	0.1915	0.6617	-0.0273785
unlikely to negotiat_cont	0.5290	0.5421	0.9522	0.3292	0.0892589
very unlikely_contract	0.4169	0.7650	0.2970	0.5858	0.0703409

Hosmer and Lemeshow goodness-of-fit test

Chi-square	DF	Pr>Chi-square
5.7320	8	0.6772

Other tests

Criterion	Intercept only	Intercept and covariates
AIC	339.361	294.415
SC	342.866	378.543
-2 Log Likelihood	337.361	246.415

***, **, * represent significance at 1%, 5% and 10% respectively

Table 5.2 Summary of significant variables, their effect/relationship on contract adoption

Variable	Anticipated sign	Effect/relationship
Expected contract price	+	+
Expected auction price	-	-
Expected contract fertilizer cost	-	-
Expected non-contract fertilizer cost	+	+
Expectation on informal lender loan	-	+
Previous contracting experience	+/-	+
Tobacco farming experience	+/-	-
Off-farm income	+/-	+
Junior secondary school **(primary sch.-ref. category)**	+/-	-
Expected auction market rejection rate	+	-
Somewhat likely to negotiate for price on auction **(very unlikely-ref. category)**	-	-
Unlikely to negotiate for price on auction **(very unlikely-reference category)**	-	-

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

Tobacco is the major foreign exchange earner in Malawi and is important in various aspects, including improving the social standards of people in Malawi through the employment it provides to many. The (burley) tobacco farming community has been characterized by smallholder farming since the industry was liberalized in the early 90's. This has seen Malawi's tobacco being described of being of poor quality, which also affects the prices offered at the market hence also affecting farmers' profits. The government introduced the Integrated Production system, which also aims at increasing the contractual production of the crop and basically refocusing the industry towards the contract production system. This, however found some challenges to be achieved in the first year(s) of implementation. The study was aimed at determining factors that influence smallholder tobacco farmers' decisions regarding contracting.

The study used primary data which were collected using a questionnaire and analyzed using SAS and Stata softwares by producing descriptive statistics and running a logistic regression.

6.1 Summary of findings

Empirical results show that tobacco farming in Malawi is male dominated in terms of crucial decision making regarding tobacco farming, with more than 97 percent

of the crucial decision makers being male. These farmers allocate less than 40 percent of their landholding size to tobacco production. It has also been found that tobacco farming contributes a significant part on tobacco farmers' income and social status. More than 70 percent of their total annual income comes from tobacco.

The study has found some factors that influence the farmers' decisions regarding contracting. On factors from theory, expected prices and expected cost have been found to influence the farmers' decision to contract, while expected yields and yield variance do not influence tobacco contracting decision. Expectation on availability of loans from informal lenders, experience in contracting, experience in tobacco farming, income from non-agricultural sources, a dummy for education level and a dummy for negotiation ability, all influence contracting decision differently. Age, household income and observation from other farmers, which in some studies have been found to affect contracting decision, do not influence tobacco contracting decision. This finding also agrees with the findings of Ilembo et al[4] who found age and household income not to affect adoption of input credit in tobacco contracts.

6.1.1 Other observations

One interesting finding from the study is that contrary to Smale et al. (1994) who stated that farmers in developing countries do not allocate all their land to contract production, tobacco farmers either contract all their land allocated to tobacco, or do not at all, allocate their land allocated to tobacco production to contract farming.

[4] The paper does not provide the year of publication.

Apart from the findings from the econometric analyses, it was also found that most farmers that had prior contracting experience do not know the amount of loan they get from the companies in monetary value, they do not know the prices at which they were given the inputs, and also the interest rate on the loan.

It was also observed that the contract itself does not include the prices at which the specific grades of tobacco will be bought at, apart from the government set minimum prices.

6.2 Policy implications

The findings from the study provides stakeholders with relevant information on how they can achieve their goal of re-defining the Malawi tobacco industry into a contract production based industry, through the newly introduced Integrated Production System (IPS). It provides information on what tobacco farmers take into consideration when making tobacco production contracting decisions.

Farmer expectations on the contract market are very good, and even the simple profits calculated from the elicited data showed higher expected profits from the contract production but there is still something that the government and the contracting companies should do to achieve the above stated goal. The government, through the ministry of agriculture and the tobacco control commission could look into the prices that they set in terms of the marketing season's minimum prices since a farmer is likely to take a contract if they are expecting a higher price in the contract market. Tobacco buyers could also take this and use it to their advantage by providing much more on top of the government set minimum prices in the contract market. Output prices should also be clearly stated in the contract documents. Perhaps, specification of something such as a percentage

addition on top of the government set minimum prices for each tobacco class would make the farmers be assured of the higher price they expect from the contract market.

The contracting companies could also try to provide the inputs at a lower prices, relative to non-contract fertilizer prices. Or perhaps the government should also help by providing subsidies to fertilizer for contract tobacco production, or under proper review and consultations, extend the Fertilizer Input Subsidy Program (FISP) to tobacco and restrict it to contract production if applied to tobacco. In addition, fertilizer prices, and interest rate at which they provide the inputs should be clearly stated to the farmers in the contract.

Another implication from the study is that over time, as more growers get experienced in contract production, the proportion of contracted production should increase. This is due to the fact that previous contracting experience was positively related to the probability of contracting next year.

6.3 Study limitations and areas for further research

This study only concentrated on adoption of contract farming in a more general view, and also a contract in a similar view. Other researchers could possibly add to it how adoption differs among contracting companies. Other decision variables such as fertilizer application rates might also be considered in estimation, and not only percentage of land allocated to contract production as in this study.

The study also used expected prices, expected yields and expected fertilizer costs were used on their absolute levels. It is recommended that for future research, these variables should be treated as a ratio of contracted to non-contracted production, as what drives contract adoption is the ratio of these variables and not their absolute levels.

Trust issues are also very important in contract agreements. The study did not capture any data on farmer trust on the contractor.

The study also just looked at the supply side of contracting. Future research might want to talk to tobacco buyers to better understand factors that drive the demand for contracted tobacco relative to non-contracted tobacco. Others have also looked at contracting as principal-agent game. This study did not take the adoption concept as a game, however, with the budding of economic experiments in social research, other researchers could probably look into the tobacco contract adoption through economic experimentation.

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APPENDIX A

ENGLISH VERSION OF QUESTIONNAIRE

Questionnaire

1. Are you the person in your household who generally makes decisions about selling tobacco? Yes No

    a. If yes, continue. If no, terminate questionnaire.

2. How many acres of land do you ***expect*** to have in crop production (for all crops) during the upcoming growing season? _____Acres

3. Do you intend to produce tobacco during the upcoming growing season? Yes No

    a. If yes, continue. If no, terminate questionnaire.

4. How many acres of land do you ***expect*** to allocate to tobacco production during the upcoming growing season? _____ Acres (*must be less than or equal to the response to question 2*).

5. How many acres of land do you ***expect*** to allocate to **contracted** tobacco production during the upcoming growing season? _____ Acres (*must be less than or equal to the response to question 4*).

    a. If the answer to question 4 is **not equal** to the answer to question 3 (i.e., the respondent intends to have some non-contracted production), proceed to question 6.

    b. Have you ever previously engaged in **non-contracted** tobacco production (production that will be sold in the auction market)? Yes No

        i. If the answer to 5.b is "No", then terminate questionnaire.

6. In how many previous growing seasons (not including the upcoming growing season) have you **contracted** at least some of your tobacco production? _____ Seasons

    a. If the answer to question 6 is zero, proceed to question 7.

b. With how many different companies have you entered into tobacco production contracts? _____ Companies

NON-CONTRACTED TOBACCO PRODUCTION SOLD THROUGH AUCTION

7. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, how much would you ***expect*** to spend on tobacco seed? MK _____

8. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, how much would you ***expect*** to spend on fertilizers applied to the tobacco crop? MK _____

9. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, how much would you ***expect*** to spend on pesticides applied to the tobacco crop? MK _____

10. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, would you ***expect*** to be ***able*** to take out a loan from a bank (or other **formal** lender such as a microfinance institution) to cover at least part of the input cost? Yes No

    a. If no, proceed to question 11. If yes,

        i. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, what would you ***expect*** to be the maximum amount that a bank (or other formal lender) would lend you to purchase seed, fertilizer, and pesticide inputs? MK _____

        ii. What interest rate would you ***expect*** the bank (or other formal lender) to charge for an input loan? _____%

11. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, would you ***expect*** to be ***able*** to take out a loan

from an **informal** money lender such as relatives, friends or local money lenders to cover at least part of the input cost? Yes No

b. If no, proceed to question 12. If yes,

i. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, what would you ***expect*** to be the maximum amount that an informal money lender would lend you to purchase seed, fertilizer, and pesticide inputs? MK _____

ii. What interest rate would you ***expect*** the informal money lender to charge for an input loan? _____%

12. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, how much total quantity of tobacco (kgs) would you ***expect*** to produce during the upcoming growing season? _____ kgs

13. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, what is the ***highest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

14. If all of your tobacco acres (response to question 4) were allocated to **non-contracted** tobacco production, what is the ***lowest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

15. For **non-contracted** tobacco production produced during the upcoming growing season, what price would you ***expect*** to receive? MK _____

16. For **non-contracted** tobacco production produced during the upcoming growing season, what is the ***highest*** possible price that you could reasonably expect to receive? MK _____

17. For **non-contracted** tobacco production produced during the upcoming growing season, what is the ***lowest*** possible price that you could reasonably expect to receive? MK _____

18. For **non-contracted** tobacco production, how likely is it that you would be **able** to ***negotiate for a higher price*** after receiving an initial auction price?

Very Likely Somewhat Likely Unlikely Very Unlikely

19. For **non-contracted** production, out of say 100 bales delivered, how many bales would you ***expect*** be rejected at the initial sale attempt in the auction market? _____ bales

20. For **non-contracted** production, after delivery to the auction floor, how many days do you ***expect*** it would take for the tobacco to sell? _____ days

21. For **non-contracted** production, how many trips would you ***expect*** to make to complete the registration process? _____ trips

22. How much you would ***expect*** to spend per trip in the registration process (include cost of transportation, food, etc.)? MK _____

CONTRACTED TOBACCO PRODUCTION

If the answer to question 5 is zero, skip to question 30? Else, go to question 23. (Questions for those who are contracting during the upcoming growing season)

23. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), how much do you ***expect*** the tobacco seed will cost? MK _____

24. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), how much do you ***expect*** the fertilizers applied to the tobacco crop will cost? MK _____

25. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), how much do you ***expect*** the pesticides applied to the tobacco crop will cost? MK _____

26. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), do you ***expect*** to receive a loan to cover all of the seed, fertilizer, and pesticide costs?

    Yes No

    a. If yes, what interest rate do you expect to pay on the input loan? _____%

27. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), how much total quantity of tobacco (kgs) do you ***expect*** to produce during the upcoming growing season? _____ kgs

28. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), what is the ***highest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

29. For the acres allocated to **contracted** tobacco production for the upcoming growing season (response to question 5), what is the ***lowest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

(Questions for those who are not contracting for the upcoming growing season)

30. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, how much would you ***expect*** the tobacco seed to cost? MK _____

31. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, how much would you ***expect*** the fertilizers applied to the tobacco crop to cost? MK _____

32. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, how much would you ***expect*** the pesticides applied to the tobacco crop to cost? MK _____

33. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, do you ***expect*** that you would receive a loan to cover all of the seed, fertilizer, and pesticide costs?

    Yes No

    a. If yes, what interest rate would you ***expect*** to pay on the input loan? _____%

34. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, how much total quantity of tobacco (kgs) would you ***expect*** to produce during the upcoming growing season? _____ kgs

35. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, what is the ***highest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

36. If all of your tobacco acres (response to question 4) were allocated to **contracted** tobacco production, what is the ***lowest*** possible quantity of total tobacco (kgs) that you could reasonably ***expect*** to produce during the upcoming growing season? _____ kgs

(The following questions are for **all** respondents, regardless of whether or not they actually intend to contract in the upcoming growing season)

37. For **contracted** tobacco production produced during the upcoming growing season, what price would you ***expect*** to receive? MK _____

38. For **contracted** tobacco production produced during the upcoming growing season, what is the ***highest*** possible price you could reasonably ***expect*** to receive? MK _____

39. For **contracted** tobacco production produced during the upcoming growing season, what is the ***lowest*** possible price you could reasonably ***expect*** to receive? MK _____

40. For **contracted** tobacco production, how likely is it that you would be able to negotiate for a higher price after receiving an initial price offer?

Very Likely Somewhat Likely Unlikely Very Unlikely

41. For **contracted** production, out of 100 bales delivered, how many bales would you ***expect*** be rejected at the initial sale? _____ bales

42. For **contracted** production, after delivery to the auction floor, how many days do you ***expect*** it would take for the tobacco to sell? _____ days

43. For **contracted** production, how many trips would you ***expect*** to make to complete the registration process? _____ trips

GENERAL

44. How long have you been growing tobacco? _____ years

45. Think about other farmers you know who have experience with tobacco contracting. How would you describe their experiences?

Very Positive Positive Neutral Negative Very Negative

Or

No knowledge of other farmers' contracting experiences

46. How would you assess the desirability of the following aspects of contracting?

Availability of input loan Positive Neutral Negative

Acquisition of technical knowledge Positive Neutral Negative

Time from delivery to sale	Positive	Neutral
	Negative	
Number of selling days	Positive	Neutral
	Negative	
Rejection rate	Positive	Neutral
	Negative	
Confidence that you will be paid	Positive	Neutral
	Negative	
Time to get paid after selling	Positive	Neutral
	Negative	
Price received by farmer	Positive	Neutral
	Negative	
Other _____	Positive	Neutral
	Negative	
_____	Positive	Neutral
	Negative	
_____	Positive	Neutral
	Negative	

47. How can you assess the desirability of the following aspects of non-contracting?

Availability of input loan	Positive	Neutral
	Negative	
Time from delivery to sale	Positive	Neutral
	Negative	
Number of selling days	Positive	Neutral
	Negative	
Rejection rate	Positive	Neutral
	Negative	
Confidence that you will be paid	Positive	Neutral
	Negative	

Time to get paid after selling	Positive	Neutral
	Negative	
Price received by farmer	Positive	Neutral
	Negative	
Other _____	Positive	Neutral
	Negative	
_____	Positive	Neutral
Negative		
_____	Positive	Neutral
	Negative	

48. Gender of household head

Male

Female

49. How old are you? _____ years

50. What is the highest level of education you attained?

Primary school

Junior certificate

MSCE

Tertiary

51. How many members are in your household? _____ members

52. Do you….

Live in iron roofed house?	Yes	No
Have a car?	Yes	No
Have a bicycle?	Yes	No
Have a television set?	Yes	No

Have a cellphone? Yes No

53. What is your approximate annual household income (from all sources)? MK _____

54. Considering your response to question 53, how much of this amount comes from non-agricultural sources? MK _____

55. Considering your response to question 53, how much of this amount comes from tobacco sales? MK _____

Thank you for participating in this questionnaire.

APPENDIX B

CHICHEWA VERSION OF QUESTIONNAIRE

KAFUKUFUKU WOKHUDZA ALIMI A FODYA NDI NKHANI YA MGWIRIZANO

1. Kodi ndinu amene mumapanga ziganizo zofunikira zokhudzana ndi ulimi wa fodya pakhomo panu? Eya Ayi
    a. **Ngati 'Eya' pitirizani. Ngati 'Ayi' lekezani pompa,**
2. Kodi ndi malo olimapo wochuluka bwanji (onse pamodzi oti mutha kulimapo mbeu zonse) amene mukuyembekezera kulimapo mu chaka chino? Ma ekala_____
3. Kodi mukulingalira zolima fodya chaka chino (sizoni ino)? Eya Ayi
    a. **Ngati 'eya', pitirizani kufunsa. Ngati 'ayi', lekezani pomwepa, pitani kwa wina**
4. Kodi ndi malo wochuluka bwanji (ma ekala angati) amene mukuyembekezera kulimapo fodya? Ma ekala_____ ***(akhale ofanana kapena wochepera kwa omwe atchula ku funso 1)***
5. Kodi ndi ma ekala angati omwe mukuyembekezera kulimapo fodya wa mgwirizano? _____ Acres ***(akhale ofanana kapena wochepera kwa omwe atchula ku funso 3)***
    a. Ngati ma ekala ali wosiyana ndi amene atchulidwa mu 3 (kusonyeza kuti akulingalira kulimako pa mgwirizano), pitirizani kufunsa 6
    b. Kodi munalimapo fodya wopanda mgwirizano (wogulitsa ku chipandepande/okoshoni) mu zaka za mmbuyomu? Eya Ayi
        i. **Ngati 'ayi', lekezani pomwepa kufunsa**
6. Kodi ndi ma sizoni angati/zaka zingati mmbuyomu (kupatula chaka chino) zomwe munalimako fodya pa mgwirizano? Ma sizoni _____
    a. Kodi munalowako mgwirizano ndi ma kampani angati wosiyana? Ma kampani_____

ZOKHUDZANA NDI KULIMA FODYA OPANDA MGWIRIZANO

7. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, wogulitsa pa okoshoni, mungayembekezere kuonononga ndalama zingati pa njere? MK _____

8. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, mungayembekezere kuonononga ndalama zingati pa feteleza? MK _____
9. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, mungayembekezere kuonononga ndalama zingati pa mankhwala a tizilombo ndi ena opopera? MK _____
10. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, mungathe kuyembekezera kuti mutha kutenga ngongole ku banki kapena ku bungwe la ngongole za ulimi kapena bizinesi, yokuthandizani kugula zina mwa zipangizo kapena zonse zokhudzana ndi ulimi wanu wa fodya wu? Eya Ayi
    a. ***Ngati 'Ayi' pitani ku funso 11. Ngati 'Eya' pitirizani kufunsa***
        i. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, mungathe kuyembekezera kuti banki ingathe kukupatsani ndalama zingati zochulukitsitsa, kuti mugulire zipangizo monga mbeu, feteleza ndi mankhwala? MK _____
        ii. Kodi mungathe kuyembekezera chiongola dzanja cha bwanji ku banki chokhudzana ndi ngongoleyi? _____%
11. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, mungathe kuyembekezera kuti mutha kutenga ngongole kwa anzanu, achibale kapena obwereketsa ndalama mmudzi, yokuthandizani kugula zina mwa zipangizo kapena zonse zokhudzana ndi ulimi wanu wa fodya wu? Eya Ayi
    a. ***Ngati 'eya' pitani ku funso 11. Ngati 'ayi' pitirizani kufunsa***
        i. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **opanda mgwirizano**, mungathe kuyembekezera kuti obwereketsawa angathe kukupatsani ndalama zingati zochulukitsitsa, kuti mugulire zipangizo monga mbeu, feteleza ndi mankhwala? MK _____
        ii. Kodi mungathe kuyembekezera chiongola dzanja cha bwanji kwa obwereketsa ndalama wa chokhudzana ndi ngongoleyi? _____%

12. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, ndi fodya wochuluka bwanji amene mungathe ***kuyembekezera*** kukolola? _____ kgs
13. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, ndi fodya wambiri bwanji ***wochulukitsitsa*** amene mungathe ***kuyembekezera*** kukolola? _____ kgs
14. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 4 mwalimapo fodya **opanda mgwirizano**, ndi fodya wambiri bwanji ***wochepetsetsa*** amene mungathe ***kuyembekezera*** kukolola? _____ kgs
15. Kodi ndi mtengo wanji womwe ***mukuyembekezera*** kupatsidwa ku ***msika wa chipandepande*** mu msika ukudzawu? _____ USD
16. Kodi ndi mtengo wanji ***wokulitsitsa*** womwe ***mukuyembekezera*** kupatsidwa ku msika wa chipandepande mu msika ukudzawu? _____ USD
17. Kodi ndi mtengo wanji ***wochepetsetsa*** womwe ***mukuyembekezera*** kupatsidwa ku msika wa chipandepande mu msika ukudzawu? _____ USD
18. Kodi mukuganiza kuti padzakhala kuthekera bwanji kukhala ndi mwayi ***wopempha mtengo wowonjezera*** mutapatsidwa kale mtengo ku msika wa chipandepande (wa okoshoni)?

    Zotheka kwambiri Zotheka pang'ono Zosatheka Zosatheka kwambiri
19. Ku msika wa chipandepande (wa okoshoni), kodi pa ma belo 100 aliwonse, ndi ma belo angati omwe ***mukuyembekezera*** kuti angathe kubwelera osagulidwa? _____
20. Kodi fodya wopanda mgwirizano akatsitsidwa ku okoshoni, ndi masiku angati omwe ***angayembekezereke*** kukhala atagulidwa? Masiku _____
21. Kodi munayenda kapena ***mukuyembekezera*** kuyenda ma ulendo angati kupita kokhomera chitupa ***chopanda mgwirizano***? Ma ulendo _____
22. Kodi ***mukuyembekezera*** kuononga ndalama zingati pa ulendo umodzi wopita kukakhomera chitupa? MK _____

ZOKHUDZANA NDI KULIMA FODYA WA MGWIRIZANO

If the answer to question 5 is zero, skip to question 30? Else, go to question 23.

(Questions for those who are contracting during the upcoming growing season)

23. Pa ma ekala omwe mutalimepo fodya **wa mgwirizano** (funso 5), kodi ***mukuyembekezera*** kuononga ndalama zingati pa mbeu? MK _____
24. Pa ma ekala omwe mutalimepo fodya **wa mgwirizano** (funso 5), kodi ***mukuyembekezera*** kuononga ndalama zingati pa feteleza? MK _____
25. Pa ma ekala omwe mutalimepo fodya **wa mgwirizano** (funso 5), kodi ***mukuyembekezera*** kuononga ndalama zingati pa mankhwala a tizilombo ndi ena opopera? MK _____
26. Pa ma ekala omwe mutalimepo fodya **wa mgwirizano** (funso 5), kodi ***mukuyembekezera*** kulandira/kutenga ngongole yokwanira kugula mbeu, feteleza ndi mankhwala a zilombo zokwanira malo mukuyembekezera kulimawa? Eya Ayi
    a. Ngati 'eya', kodi mukuyembekezera kudzapereka chiongola dzanja chotani pa ngongoleyi? _____%
27. Kodi pa ma ekala amene mutalimepo fodya **wa mgwirizano** (funso 5), ***mukuyembekezera*** kudzakolola fodya wochuluka bwanji? _____ kgs
28. Nanga pa ma ekala amene mutalimepo fodya **wa mgwirizano** (funso 5), kodi ndi zokolola zanji ***zochulukitsitsa*** zomwe ***mukuyembekezera*** kuti mungadzathe kukolola chaka chino? _____ kgs
29. Nanga pa ma ekala amene mutalimepo fodya **wa mgwirizano** (funso 5), kodi ndi zokolola zanji ***zochepetsetsa*** zomwe *mukuyembekezera* kuti mungadzathe kukolola chaka chino? _____ kgs

Mafunso okhudza amene sakulima pa mgwirizano chaka chino

30. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, mungayembekezere kuonononga ndalama zingati pa mbeu? MK _____
31. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, ***mungayembekezere*** kuonononga ndalama zingati pa feteleza? MK _____

32. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, ***mungayembekezere*** kuonononga ndalama zingati pa mankhwala a tizilombo ndi ena opopera? MK _____
33. Mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, kodi mungathe ***kuyembekezera*** kulandira ngongole yokwanira kugula mbeu, feteleza ndi mankhwala a zilombo zokwanira malo mukuyembekezera kulimawa? Eya Ayi
    a. Ngati 'Eya', kodi mungathe kuyembekezera kudzapereka chiongola dzanja chotani pa ngongoleyi? _____% Don't know

34. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, mungathe kuyembekezera kukolola fodya wochuluka bwanji? _____ kgs
35. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, kodi ndi zokolola zanji ***zochulukitsitsa*** zomwe mungathe kuyembekezera kuti mungathe kukolola? _____ kgs
36. Kodi mutakhala kuti pa ma ekala mwatchula mu funso 3 mwalimapo fodya **wa mgwirizano**, kodi ndi zokolola zanji ***zochepetsetsa*** zomwe mungathe kuyembekezera kuti mungathe kukolola? _____ kgs

Mafunso otsatirawa ndi a wina aliyense (wolima pa mgwirizano komanso wolima opanda mgwirizano)

37. Kodi mukuyembekezera mtengo wanji ku **msika wa mgwirizano**? _____ USD
38. Kodi ndi mtengo wanji ***wokulitsitsa*** womwe mukuyembekezera ku **msika wa mgwirizano**? _____ USD
39. Kodi ndi mtengo wanji ***wochepetsetsa*** womwe mukuyembekezera kupatsidwa ku **msika wa mgwirizano** mu msika ukudzawu? _____ USD
40. Kodi mukuganiza kuti ndizotheka bwanji (kwambiri zedi, kwambiri, osati kwenikweni, zosatheka) kudzatha kupempha mtengo wowonjezera mutapatsidwa kale mtengo ku msika wa mgwirizano?

    Kwabiri zedi kwambiri zokaikitsa zokaikitsa kwambiri

41. Pa ma belo 100 aliwonse (mzere umodzi) ku **msika wa mgwirizano**, kodi ndi ma belo angati omwe ***mukuyembekezera*** kuti angadzathe kubwelera osagulidwa? Ma belo _____
42. Kodi fodya **wa mgwirizano** akatsitsitsidwa ku okoshoni, ndi masiku angati omwe ***mungayembekezere*** kuti fodyayu akhala atagulidwa? Masiku _____
43. Kodi munayenda kapena ***mukuyembekezera*** kuyenda ma ulendo angati kupita kokhomera chitupa cha mgwirizano? Ma ulendo _____

Mafunso Ena

44. Kodi mwakhala mukulima fodya kwa zaka zingati? Zaka _____
45. Kodi zomwe anakumana nazo anzamu kapena alimi ena amene analowako mu mgwirizano mungazilongosole motani pa mlingo wochoka ku zabwino kwambiri mpaka zosakhala bwino?

    Zabwino zedi zabwinoko pakatin'pakati zoipa zoipa zedi

    Kapena

    Sindikudziwa zomwe anakumana nazo ena pa nkhani yokhudza ulimi wa mgwirizano

46. Kodi nkhani zokhudzana ndi ulimi wa fodya pa mgwirizano zotsatirazi mungazilinge bwanji pa kufunika kwake ku mbali yanu? ("ZF" kuimira Zofunikira; "NB" kuimira Ndilibe Mbali; "ZS" kuimira Zosafunikira)

    Kupezeka kwa ngongole ZF NB ZS

    Kudziwa/kuphunzirako zina zatsopano ZF NB ZS

Nthawi kuchoka potsitsa mpaka kukgulitsa ZF NB ZS

Kuchuluka kwa masiku ogulitsira ZF NB ZS

Fodya kubwelera/kusagulidwa pa msika ZF NB ZS

Zokhudzana ndi kupempha mtengo wowonjezera ku msika ZF NB ZS

Chikhulupiliro choti mulipidwa ndalama zanu mukagulitsa ZF NB ZS

Kutalika kwa nthawi kuti ndalama zikufikeni mukagulitsa ZF NB ZS

Zina _____

_____

_____

_____

47. Kodi nkhani zokhudzana ndi ulimi wa fodya wopanda mgwirizano zotsatirazi mungazilinge bwanji pa kufunika kwake kwa inuyo?

Kupezeka kwa ngongole ZF NB ZS

Nthawi kuchoka potsitsa mpaka kukgulitsa ZF NB ZS

Kuchuluka kwa masiku ogulitsira ZF NB ZS

Fodya kubwelera/kusagulidwa pa msika ZF NB ZS

Zokhudzana ndi kupempha mtengo wowonjezera ku msika ZF NB ZS

Chikhulupiliro choti mulipidwa ndalama zanu mukagulitsa ZF NB ZS

Kutalika kwa nthawi kuti ndalama zikufikeni mukagulitsa ZF NB ZS

Zina _____

_____

_____

48. Kodi mutu wa banja ndi wammuna kapena wamkazi?

Wammuna Wamkazi

49. Muli ndi zaka zingati? _____

50. Kodi sukulu munafika nayo patali bwanji?

Pulayimale

JC

MSCE

Kupitilira sekondale

51. Kodi pakhomo lanu mulipo anthu angati? _____

52. Kodi muli ndi:

Nyumba ya malata?	Eya	Ayi
Galimoto?	Eya	Ayi
Njinga ya moto	Eya	Ayi
Njinga ya kapalasa?	Eya	Ayi
TV?	Eya	Ayi
Foni ya mmanja?	Eya	Ayi

53. Kodi mumatha kupeza ndalama zingati pa chaka kuchoka ku chilichonse chomwe chimakubweretserani ndalama? MK _____

54. Pa ndalama mwatchula mmwambamu (funso 52), ndi zingati zomwe zimachokera ku ntchito zina zosakhudzana ndi ulimi? MK _____

55. Pa ndalama mwatchula mmwambamu (funso 52), ndi ndalama zingati zomwe zimachokera ku ulimi wanu wa fodya? MK _____

Zikomo kwambiri potenga nawo mbali mu kafukufukuyu

APPENDIX C

IRB APPROVAL

Protocol Title: Factors Influencing Malawian Tobacco Farmers' Decisions Regarding Contracting

Protocol Number: 14-287

Principal Investigator: Mr. Penjani Singini

Date of Determination: 9/26/2014

Qualifying Exempt Category: 45 CFR 46.101(b) (2)

Attachments: 14-287 - Approved Informed Consent (in follow-up e-mail)

Dear Mr. Singini:

The Human Research Protection Program has determined the above referenced project exempt from IRB review.

Please note the following:

- Retain a copy of this correspondence for your records.
- An approval stamp is required on all informed consents. You must use the wording from the stamped consent form for obtaining consent from participants.
- Only the MSU staff and students named on the application are approved as MSU investigators and/or key personnel for this study.
- You do not need to submit an application for annual continuing review; however, a new application must be submitted if the study is ongoing after 5 years from the date of approval. (SOP 01-03 Administrative Review of Applications)
- Any modifications to the project must be reviewed and approved by the HRPP prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project.
- Per university requirement, all research-related records (e.g. application materials, letters of support, signed consent forms, etc.) must be retained and available for audit for a period of at least 3 years after the research has ended.
- It is the responsibility of the investigator to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under the Mississippi State University's OHRP Federalwide Assurance #FWA00000203. All forms and procedures can be found on the HRPP

website: www.orc.msstate.edu.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me atkmyhand@orc.msstate.edu or call 662-325-3294.

Finally, we would greatly appreciate your feedback on the HRPP approval process. Please take a few minutes to complete our survey at https://www.surveymonkey.com/s/YZC7QQD.

Sincerely,

Katie Myhand
Assistant Compliance Administrator

cc: Barry Barnett (Advisor)

APPENDIX D

IRB APPROVED CONSENT FORM

Mississippi State University

Informed Consent Form for Participation in Research

Title of Research Study: Factors Influencing Malawian Tobacco Farmers' Decisions Regarding Contracting

Study Site: Lilongwe, Kasungu, and Dowa Districts, Malawi

Researchers: Penjani Singini, M.S. student; Barry J. Barnett, Professor; Ardian Harri, Assoc. Professor; Kalyn Coatney, Asst. Professor; Jesse Tack, Asst. Professor; Yohane Chimbalanga, Enumerator; Chimwemwe Khoswe, Enumerator; Tabitha Nindi, Enumerator

Purpose

The purpose of this research is to better understand factors that influence the contracting decisions of smallholder tobacco farmers in Malawi.

Procedures

If you agree to participate in this study you will be interviewed by the researcher who will ask several questions about producing and selling tobacco. The questions will be read to you by the researcher from a prepared questionnaire. The interview may take up to 40 minutes to complete.

Benefits

The Government of Malawi has not been involved in developing this research project or in selecting the questions that will be asked. However, the overall findings from this research will be shared with the Government of Malawi and may help the Government develop policies that further encourage smallholder tobacco production.

Incentive to participate

You will not be paid for participating in this study.

Confidentiality

Your name will not be recorded with your responses. Our records will only indicate that you are a tobacco farmer who was interviewed at this location.

Please note that these records will be held by a state entity and, therefore, are subject to disclosure if required by law. Research information may be shared with the MSU Institutional Review Board (IRB) and the Office for Human Research Protections (OHRP).

The sponsor of this study USAID may also have access to the records of the research.

Approved: Expires:

*3#

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Questions

If you have any questions about this research project, please feel free to contact Penjani Singini at 0999 609 647 or Dr. Barry Barnett at barnett@agecon.msstate.edu.

Voluntary Participation

Please understand that your participation is voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue your participation at any time without penalty or loss of benefits.

Please take all the time you need to read through this document and decide whether you would like to participate in this research study.

If you agree to participate in this research study, please sign below. You will be given a copy of this form for your records.

_____ _____

Participant Signature Date

_____ _____

Investigator Signature Date

Approved: Expires:

*3#

09/26/14 09/26/19 14-287