LABOR USE IN SMALLHOLDER AGRICULTURE IN MALAWI: SIX VILLAGE CASE STUDIES

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ABSTRACT Based on village surveys in diverse regions of Malawi, this paper explores the features of labor use in smallholder agricultural production in Malawi. Labor contracts found in the study villages were interrelated with the high risks in agricultural production and the problem of food deficit, and provided a means for risk sharing for the employers and food security for the laborers. In addition, the relations between the users and providers of casual labor were interwoven into the wealth differences among households. The low productivity of maize among the households whose members engaged in task-contracted casual labor was not caused by the low levels of family labor input. Analysis of labor use by female-headed households revealed that the female household heads, with their children, spent more days on farm work than did the members of male-headed households in order to cope with the lack of labor. The lower income of female heads of households forced them to rely more on agricultural wage income than their male counterparts.

Key Words: Malawi; Labor; Female-headed households; Livelihoods; Agriculture.

INTRODUCTION

Labor is a key asset for smallholder households in rural Malawi. The quality and quantity of labor available to the household in terms of numbers, educational level, skills, and health constitute the human capital that becomes the basis for constructing household livelihood strategies. In the context of Malawi's smallholder production where farm mechanization is virtually nonexistent and all farm work is done manually, having access to necessary labor for agricultural production directly affects the levels of household farm income. In addition to working on a household's own farm, labor may also be deployed in off-farm economic activities, thus providing additional income to the household.

This paper explores the features of labor use in smallholder agricultural production in Malawi. Based on village surveys in diverse regions of Malawi, it first examines the types of labor used in agricultural production and their allocation to different farm tasks and crops. The paper also highlights the major characteristics of labor contracts that were used by households to obtain necessary labor. Patterns of engagements in agricultural wage labor by the household members are examined as well. It further explores the characteristics of labor use by female-headed households. The analytical approach adopted in this study is based on the framework of sustainable rural livelihoods (Carney, 1998; Ellis, 2000; Ellis & Freeman, 2005; Scoones, 1998; Scoones & Wolmer, 2002). In the

context and framework of the livelihood studies, the paper analyzes labor in terms of assets (family labor), access (sources of labor and labor contracts), and economic activity (engagement in agricultural wage labor).

The literature on labor use in rural Malawi has tended to focus on *ganyu*. *Ganyu* is a range of short-term casual labor contracts that are widely practiced in the country. Based on ethnographic research in central Malawi, Englund (1999) interpreted *ganyu* not as individualized contracts but outcomes of socially embedded relationships. On the other hand, Whiteside (2000) emphasized both the importance of *ganyu* as the major source of income for poor households and its potential conundrum, as the need to engage in *ganyu* to obtain an immediate income may conflict with own-farm production. From different perspectives, Bezner Kerr (2005) and Bryceson (2006) both argued that *ganyu* represented the intensifying inequalities and conflicts between haves and have-nots in rural Malawi.

This paper furthers the literature in two ways. First, it examines both the short-term labor contracts (such as *ganyu*) and the long-term ones such as the seasonal labor contract. The characteristics of seasonal labor contracts (which are hitherto under-researched) markedly differ from those of *ganyu* and show important implications for risks and uncertainties in smallholder production. Second, the patterns of labor deployment between male- and female-headed households are explored, and the differences between the two are found linked to income, demography and farm data. My overall aim is to broaden the scope of existing studies by examining all types of labor that are used in smallholder production, and by highlighting important gender differences in labor use.

FIELDWORK METHODS AND STUDY LOCATIONS

I. Fieldwork Methods

Fieldwork for this study was carried out in six villages in various parts of Malawi (Fig. 1): Kachamba (Mchinji District), Belo (Mangochi District), Horo (Phalombe District), Bongololo (Rumphi District), Mulawa (Mzimba District), and Mbila (Kasungu District). Care was taken to choose villages that represented several socioeconomic characteristics, such as location, the predominant ethnic group, the degree of population pressure on the land, variations in access to non-farm activities, and the proximity or remoteness from trading centers (Table 1). The aim of this selection procedure was both to include various socioeconomic situations in which smallholder production was taking place, and to find similarities and differences in labor use in various areas of rural Malawi. No claim is made, therefore, that the results of this study represent national patterns in the statistical sense. Another criterion for selection was smallholder tobacco production. This is because one aim of my broader study was to assess the role of tobacco production in overall livelihood strategies of smallholder farmers (Takane, in press).

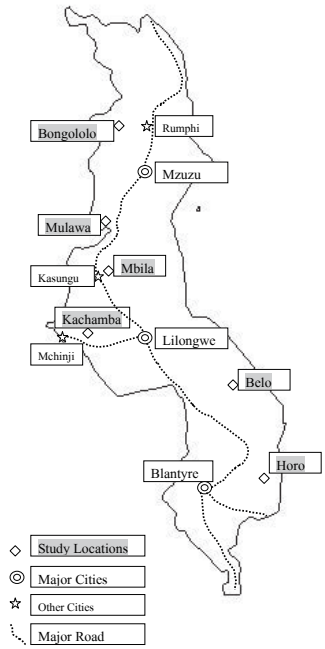

Fig. 1. Study Locations

Table 1. Summary of Study Villages and Samples (Source: Author's survey)

Study Village	Kachamba	Belo	Horo	Bongololo	Mulawa	Mbila	Total
Administrative Region	Central	Southern	Southern	Northern	Northern	Central	-
Total number of households	31	115	78	69	29	76	398
Number of sample households	31	30	32	33	28	32	186
Tobacco-growing	23	15	16	27	19	16	116
Non-Tobacco-growing	8	15	16	6	9	16	70
Average farm size per household	0.98	1.76	0.58	0.80	1.18	0.94	1.03
Population pressure on land	High	Low	Very High	High	Moderate	High	
Distance to trading centers (km)	38	42	15	1	20	5	-
Dominant ethnic group	Chewa	Mixed	Lomwe	Tumbuka	Ngoni	Chewa	-
Availability of nonfarm income opportunities	Few	Few	Few	Many	Few	Many	-
Impact of drought in 2004/05	-	-	Strong	Weak	Weak	Strong	-

The six villages are located in the same agro-ecological zone of medium altitude (760-1,300 meters), with an annual rainfall of about 800 to 1,200 millimeters. No village was selected from the lower altitude zones of Lower Shire Valley, or lakeshore areas of Lake Malawi, where farming systems considerably differed from those in the medium altitude zone. The medium altitude zone of Malawi is characterized by unreliable patterns of rainfall and degraded soils caused by increasing population pressure on the land. These have led to a low risk approach to smallholder agriculture in the study villages.

Fieldwork in Kachamba and Belo was undertaken between August and October 2004, and data were obtained for the 2003/2004 agricultural season (October to September), when agricultural production was normal. In the remain-

ing four villages, data were collected between May and September 2005 for the 2004/05 agricultural season, when a severe crop failure occurred due to erratic rain. A structured questionnaire was used in the survey that the author conducted, recorded, and reviewed. In addition, farms operated by sample households were measured using global positioning systems to obtain accurate sizes of the plots. The total sample size for all villages was 186 households.

In all study villages, farmers gave priority to the production of maize, the staple food. All sampled households grew maize, and it is estimated that 64% of total area farmed was allocated to maize production in the study villages. This echoes the result of the nationwide Integrated Household Surveys (Government of Malawi, 2005: 95), which found that 97% of the households in Malawi grew maize. The second-most important crop in the study villages in terms of allocated area was tobacco, which was estimated to occupy about 19% of total area farmed. The percentage of tobacco-growing households in the six villages was 59%. The figure is higher than the 21% obtained in the nationwide Integrated Household Surveys (Government of Malawi, 2005: 106) because I purposefully selected the tobacco-growing villages for the case studies in the present study.

Average farm size of sampled households varied greatly (Table 1). For example, households in Belo on average farmed 1.76 hectares, while those in Horo farmed only 0.58 hectare. The difference stems from the unique history of each village and the resultant degree of population pressure on land (Takane, 2008). The average for all sampled households was 1.03 hectares.

II. Characteristics of Each Study Village

The first study site, Kachamba, is a matrilineal Chewa village under the Traditional Authority (TA) Mavwere in the Central Region. Kachamba occupies an area about 6 kilometers from the Lilongwe-Mchinji road. The main crops cultivated in Kachamba were maize, groundnuts, and tobacco. Maize is by far the most important crop, but most farmers cultivated groundnuts for both sale and consumption. Due to land scarcity in the area, land was not laid fallow and was used every year. Women headed nine households. The percentage of female-headed households in Kachamba was 29%.

The second village studied, Belo, is located under the TA Mponda in the Southern Region. In contrast to the general scarcity of land in other study villages, land was still readily available in Belo at the time of the survey. The average farm size per household in Belo is the largest among the six villages, reflecting the relative abundance of land in the village. The remote location of the village delayed the inflow of population into the Belo area, and most residents at the time of the survey were first-generation migrants. They were still in the process of expanding farms on the allocated land, and the subdivision of land through gifting and inheritance to the next generation (as was observed in other study villages) was yet to occur. The community was made up of indigenous Yao residents and migrants from various parts of southern Malawi. Most

of the migrants began arriving in the area during the 1980s, opening new farms on previously uncultivated land. Among the main crops produced in the village were maize, tobacco, chilies, groundnuts, and cassava. The percentage of female-headed households was 18% (21 households).

The third study location, Horo, is a matrilineal Lomwe village under the TA Mkhumba in the Southern Region. Horo lies about 20 kilometers from Mozambique. A dirt road, often impassable by an ordinary car, links Horo to the major city of Blantyre, 70 kilometers away. A small-scale weekly market, where food crops and tobacco are traded, takes place twice a week in a nearby village. The percentage of female-headed households in Horo was 46% (36 households), which was the highest among the study villages. Maize was cultivated by all households, but also intercropped with minor crops such as pigeon peas, sorghum, millet, and sunflowers. This type of intercropping was common in many areas of southern Malawi, but was less common in my study sites in central and northern Malawi. Due to the scarcity of land in the area, fields were not laid fallow.

The fourth village studied, Bongololo, is under the TA Chikulamayembe in Northern Region. The distance from the village to the regional capital, Mzuzu, is 78 kilometers. Fertilizers are available in the adjacent town of Bolero, but some farmers buy them at the district capital, Rumphi (16 kilometers from the village), where the prices are lower than in Bolero. Almost all of the Bolero inhabitants were patrilineal Tumbuka. The percentage of female-headed households was 26% (18 households). The crops produced in Bongololo were maize, tobacco, groundnuts, cassava, soybeans, sweet potatoes, and millet. Tobacco was cultivated by 63 households (91%), among which 15 households were headed by women. The ratio of tobacco farmers in Bongololo was the highest among the six study villages. Another notable feature of the village was the availability of non-farm income opportunities. Because of the proximity to Bolero (where there were shops, a permanent market, and government offices), there was a wide range of non-farm income opportunities such as trading, carpentry, and wage employment. A very popular non-farm economic activity in the village was the brewing and sale of traditional beer (mostly done by women), in which 18 households (26%) were engaged.

The fifth study site, Mulawa, is a patrilineal Ngoni village under the TA Mzukuzuku in the Northern Region. Mulawa lies 20 kilometers away from the major road that links the capital, Lilongwe, to the northern regional capital of Mzuzu. The percentage of female-headed households was 34% (10 households). Tobacco was grown by 20 households (69%), among them four headed by women. An important feature of the farming system in Mulawa was that many households (69%) owned wetland gardens (*dimba*).[1] Among the crops grown on *dimba* land were maize, Irish potatoes, tomatoes, onions, and local vegetables. *Dimba*-grown maize was harvested a few months earlier than the maize on ordinary farms. This eased food shortages experienced by households during the "hunger season" of January and February. Other crops on *dimba* land were harvested mainly between July and September, generating cash income

and improving the diet of the households. Widely practiced *dimba* cultivation in Mulawa thus led both to higher income and better food security for many households.

The sixth study site was Mbila, five kilometers north of the district capital, Kasungu, in the Central Region. The majority of residents were matrilineal Chewa, but patrilineal Ngoni and Tumbuka also lived in the village. Villagers cultivated maize, groundnuts, soybeans, cassava, sweet potatoes, and tobacco. Tobacco was grown by 36 households (47%), among which five were female-headed households. As in Bongololo, the proximity of Mbila to a major town enabled villagers to engage in a wide range of non-farm economic activities. Such activities included trading, beer brewing, making bricks and stones used in construction, and wage employment in companies and government offices.

LABOR USE IN AGRICULTURE

Most of the farm work in rural Malawi is done during the rainy season between November and March. The types of labor used in agricultural production can be broadly classified into two categories: family labor and hired labor. Of these, family labor was the main source of labor in the villages studied. As Table 2 shows, family labor accounted for 74% of total labor used in tobacco production and 88% of that in maize production.

The importance of family labor in farm work and the lack of mechanization in agricultural production imply that the availability of family labor is a prerequisite for a household to increase farm size. However, the increase in farm size using abundant family labor is possible only under the condition that land is readily available for the expansion of a family's farm. This is not always the case in most of rural Malawi today, because increasing population pressure on the land has considerably reduced the scope of farm expansion onto uncultivated land. Among the six study villages, the correlation coefficients between household farm size and the number of household members whose age was 15 years old or over were positive and statistically significant (at the one percent level) in Kachamba, Belo, and Bongololo. In the case of Belo, unopened land was still readily available, and there remained the possibility for farm expansion by using abundant family labor. In the cases of Kachamba and Bongololo, however, unopened land was hardly available. In the two villages, it was the existence of vernacular land markets[(2)] that enabled some households to expand the size of their farm by obtaining additional land through purchase or rent (Takane, 2008). These characteristics unique to each village opened some scope for farm expansion for labor abundant households.

Apart from family labor available within the household, labor exchanges among relatives that involved other households were also practiced. In most cases such labor exchange was used for farm tasks that required much labor at a given time, such as the harvesting of maize. However, the contribution of exchanged labor to a family's overall labor input was low (less than 10%). In

Table 2. Labor Input for Maize and Tobacco Production, by Type of Labor and Farm Task (Man Days per Hectare)

Maize

	Total	Land preparation	Sowing	Fertilizer application	Weeding	Banking	Harvesting
Family labor	155	69	9	6	40	17	15
Hired labor	21	10	1	1	4	3	2
Total	176	79	9	7	45	20	17

Tobacco

	Total	Land preparation	Nursery	Transplanting	Manure/Fertilizer application	Constructing barn	Weeding	Banking	Topping	Harvesting & curing	Grading & baling	Transporting	Uprooting old stems
Family labor	538	24	113	15	20	48	48	11	153	24	69	2	9
Hired labor	188	7	43	3	4	14	17	2	57	11	26	0	4
Total	726	31	156	18	24	62	65	13	210	35	95	3	13

Note: Those under age 15 were counted as 0.5 man days/ha.

Table 2 exchanged labor is included in the category of family labor.

When a household has insufficient family labor to complete the farm tasks, hired labor is used. In the study villages, there were two types of farm tasks in which hired labor was most commonly used (Table 2). One was the farm tasks that required physical strength, such as land preparation and weeding. For these tasks, hired labor was frequently sought both by wealthy households[3] that had enough capital to pay for the labor and by labor-deficient households (such as households headed by a female or elderly person) who could not fulfill these strength-demanding tasks. Another type was the farm tasks that required much labor. Examples of such tasks included tobacco grading, the topping of tobacco plants, and the harvesting of maize and tobacco.

TYPES OF HIRED LABOR

The types of hired labor used in the study villages were seasonal labor and task-contracted casual labor. The following section examines some characteristics of these two labor contracts.

I. Seasonal Labor

In seasonal labor contracts, laborers are employed for several months in the rainy season. In most cases in the study villages the seasonal laborers came from other areas, and no kin-relation was found between the employer and laborer. The contracts were only for one season, and the laborers left the village after their contracts expired and rarely returned to the same employer in the next season. In the study villages, 10% of the sample households employed seasonal labor (Table 3). Many of the employers were wealthy farmers and all of them grew tobacco. Seasonal laborers were used for a specific crop, usually tobacco, as well as for any farm task, depending on the agreement made between the employer and laborer. In any case, the employer made all decisions on farm management, and the work of the laborers was closely monitored and supervised.

Table 3. Use of and Engagement in Agricultural Wage Labor

	Kachamba (n=31)		Belo (n=30)		Horo (n=32)		Bongololo (n=33)	
	Number of cases	%	Number of cases	%	Number of cases	%	Number of cases	%
Use of agricultural wage labor								
Seasonal labor	1	3%	4	13%	1	3%	9	27%
Task-contracted casual labor	18	58%	13	43%	11	34%	21	64%
Engagement in task contracted casual labor	14*	45%	16	53%	16	50%	10	30%
Male-headed households**	8	36%	11	48%	2	14%	6	27%
Female-headed households**	6	67%	5	71%	14	78%	4	36%

	Mulawa (n=28)		Mbila (n=32)		Total (n=186)	
	Number of cases	%	Number of cases	%	Number of cases	%
Use of agricultural wage labor						
Seasonal labor	0	0%	4	13%	19	10%
Task-contracted casual labor	17	61%	6	19%	86	46%
Engagement in task contracted casual labor	7	25%	18	56%	81	44%
Male-headed households**	4	22%	16	59%	47	37%
Female-headed households**	3	30%	2	40%	34	57%

* Including wage labor on estates.
** Percent of cases to the total number of male/female-headed households in each village.

The seasonal laborers received their payments both in cash and in kind. Payment in cash was made at the end of the contract after harvest, but the amount to be paid had been agreed upon at the beginning of the contract. Wages in kind were paid in the form of daily food. Employers provided the seasonal laborers with cooked foods, maize, or cash to buy food. When maize or cash was to be provided, laborers received them in advance on a weekly or monthly basis. Some employers also provided housing to the laborers. Payments in kind guaranteed the basic survival of the laborers in the food-lean period of November-March during which many households faced food deficit.

The seasonal labor contract described above can be regarded as a form of fixed-wage contract in which an employer pays a laborer a fixed amount of wage that was agreed upon in advance. In a fixed-wage contract, in theory, the employer bears the risks of production failure and decline in the produce price. In the study villages, however, I found many cases where contracts were amended so as to enable employers to share the risks with the laborers, as the following cases illustrates.

Case Studies: Seasonal Labor Contracts

(1) JB in Mbila employed two seasonal laborers between September and June for his 1.6-hectare farm of tobacco, maize and groundnuts. The laborers performed any farm task that JB ordered. The employer, JB, provided the laborers with daily food and housing during the period, and paid MK 4,000[(4)] to each of them at the end of the contact. The amount of cash paid was determined by JB after he received money for the tobacco harvest.

(2) EM was using a seasonal laborer between November and April and provided the laborer with food and housing in Mbila. EM and the laborer had agreed in advance that MK 12,000 would be paid to the laborer after EM received money from his tobacco sales. However, due to the erratic rain and low tobacco price that year, the cash that EM received for his tobacco was much less than what he had expected. EM renegotiated the agreement with the laborer, and paid him MK 4,000.

(3) Between September and June, AB in Mbila employed a seasonal laborer to whom AB provided 60 kilograms of maize and MK 175 every month to cover the cost of food. In addition, AB and the laborer had agreed in advance that the laborer would receive a lump sum cash payment, and that the amount to be paid would vary according to the level of tobacco production. Following this agreement, AB paid MK 3,000 to the laborer after the tobacco harvest.

(4) LG in Bongololo employed two seasonal laborers for nine months from September. LG divided his 1.2 hectare tobacco farm into two parts and had each laborer do all the farm tasks on each part of the farm. He paid each laborer 260 kilograms of maize in advance, and agreed that MK 24,000 would be paid at the end of the contract. However, the lack of rain in the 2004/05 season considerably reduced the yield, and he consequently paid only MK 12,000 to one laborer and MK 10,000 to another. LG himself suffered a large deficit that year because of the reduced tobacco production.

In the four cases above, the amount of payment in cash at the end of the contract was reduced after a bad harvest or renegotiated according to the production level. This arrangement is similar to that of a share contract in the sense that the employer and laborer share the risk of production. In a typical share contract practiced elsewhere in the developing countries, both employer and laborer receive less income when the production level is low, thus sharing the production risk. Therefore, the seasonal labor contracts practiced in the study villages can be regarded as a form of fixed-wage contract that contains a risk sharing characteristic of share contracts.

This characteristic of some seasonal labor contracts provides merits to both the employer and laborer in the context of rural Malawi. For employers it provides a means of risk sharing in a highly uncertain condition of agricultural production. Relying totally on rain-fed agriculture, smallholder farmers occasionally face production failure due to unfavorable weather. For example, the national production of maize in 2005 was less than 1.3 million tons due to unfavorable weather, while that in 2007 reached 3.4 million tons.[5] Similarly, from 2000 to 2005 national production of burley tobacco fluctuated between 103-151 thousand tons.[6] Moreover, the price of agricultural produce fluctuates widely, adding another risk towards a fall in income for the producers, as is shown in the tobacco price trends in Table 4. Under these situations, the risk sharing arrangement with laborers in a seasonal labor contract can help ameliorate the income shock faced by the employers.

Table 4. Average Auction Price of Burley Tobacco (Source: Tobacco Control Commission)

Year	Average price (US cents/kg)
1994	128.62
1995	148.18
1996	161.30
1997	152.95
1998	129.65
1999	138.06
2000	101.93
2001	109.77
2002	111.40
2003	113.68
2004	109.02
2005	98.89

Table 5. Months when Households Exhausted their Own Maize Stock

	Kachamba	Belo	Horo	Bongololo	Mulawa	Mbila	Total
Beyond next harvest	42%	53%	6%	3%	14%	6%	20%
March or later	6%	0%	9%	48%	11%	25%	17%
January - February	23%	7%	28%	18%	14%	31%	20%
November - December	26%	3%	19%	12%	14%	6%	13%
October or earlier	3%	20%	19%	6%	14%	19%	13%
Unknown	0%	17%	19%	12%	32%	13%	15%

Note: Data are for maize production in the 2002/03 season in Kachamba and Belo, and the 2003/04 season in the other study villages.

Reduced cash payment in a bad harvest year is clearly a demerit for laborers. In some cases, employers unilaterally imposed a reduction in cash payment, contrary to the agreement made in the beginning of the season. This stems from the unequal power relation between the employer and laborer, and represents a clear disadvantage for the latter. On the other hand, the seasonal labor contract can merit the laborers as it guarantees food security for them during the lean period with payments in kind. The guaranteed provision of food during this season is crucial to many poor households in rural Malawi that exhaust their maize stock during the rainy season (Table 5), and otherwise have to look for opportunities for casual labor in order to buy food. Seasonal laborers are in a better position, because their contracts guarantee the opportunity for income smoothing (Morduch, 1995) through the arrangement of payments in kind by the employer. Thus, the unique characteristics of seasonal labor contracts provide the employer with a means for risk sharing[7] and the laborer with a means of income smoothing.

II. Task-contracted Casual Labor

Task-contracted casual labor (*ganyu*[8]) was widely used for various farm tasks in the study villages. In this contract, wages were paid upon completion of a

specific task, such as weeding. The rewards varied depending on the types of work and the ages of the laborers. There were some distinct difference between task-contracted casual labor and seasonal labor. First, the duration of work in task-contracted casual labor was much shorter, typically less than a week but occasionally a few weeks, than that of seasonal labor. Second, laborers were recruited from within the village or nearby villages. Third, the percentage of sample households using task-contracted casual labor (46%) was much higher than that using seasonal labor (10%). User households included both wealthy households that had enough cash to pay for laborers and poor households that had insufficient family labor to complete farm tasks by themselves. Thus, both the poor and wealthy households utilize the task-contracted casual labor for different purposes. On the other hand, engaging in task-contracted casual labor was mostly confined to poorer households. This is because the poorer households had to supplement their low own-farm income by engaging in agricultural wage labor. The total engagement rate among the sample households was 44 percent.

In task-contracted casual labor contracts, laborers were paid in cash or in kind (usually maize or cooked food) or both. In both tobacco and maize production the majority of payments involved cash, but there were sizable cases of payment in kind (mainly maize) for the casual labor employed for maize production. In fact, some households with maize surplus used task-contracted casual labor extensively for farm work in the production and paid the laborers with maize. A wealthy farmer with two hectares of farm land in Kachamba, for example, used task-contracted casual labor for his maize and groundnut farms for 65 man-days and paid the laborers 37 pails (about 740 kilograms) of maize. As the season of high demand for task-contracted casual labor (October to March) coincides with the time when poorer households exhaust their maize stocks, these labor arrangements provide an important opportunity for households short of maize to survive during the lean period. However, when production failure affects most of the households in a given area, demand for task-contracted casual labor and its wage-level would considerably decrease because of the general lack of working capital among the farmers. Therefore, the task-contract casual labor is an unreliable income source for the poorer segment of the rural population.

As Englund (1999) and Devereux (1999) rightly argued, task-contracted casual labor is neither an arrangement of wealth-sharing nor an informal transfer between the rich and the poor. Rewards are paid as returns on the labor provided on the basis of a commercial exchange. On the other hand, it is also true that villagers share the feeling of moral obligation whereby wealthy farmers should provide other villagers with opportunities to engage in task-contracted casual labor. Thus, the labor arrangement conveys the image of both an economic contract and a social obligation (Whiteside, 2000: 4-5; Ellis et al., 2003: 1509; Bryceson, 2006: 178).

Some literature has suggested that the engagement of poor households in task-contracted casual labor (*ganyu*) may result in food insecurity. For example,

Whiteside (2000) pointed out that the need to engage in task-contracted casual labor to obtain an immediate supply of food may mean less labor input for own-farms in a less timely manner during this critical farming period, which may result in a smaller harvest, and can lock some households into a vicious cycle of food insecurity. For this reason, Devereux suggested that task-contracted casual labor can be an erosive survival strategy when farmers neglect their own farming activities (Devereux 1999: 12).

The data obtained in the six study villages suggest the need to distinguish between the *amount* and *timing* of labor input when we examine the potential competition between task-contracted casual labor and own-farm production. It is true that the households who engaged in task-contracted casual labor produced less maize per hectare than those who did not, as Table 6 shows. However, the correlation coefficients between maize production per hectare and labor input per hectare in five villages (except in Belo[9]) were statistically insignificant. This implies that the higher productivity of maize was not caused by increased labor input. The difference in maize productivity between the two types of households, observed in the six villages, seemed to be the result of the level of fertilizer use (Table 6). In addition, the labor input for own-farm maize plots among households providing task-contracted casual labor was not less than that of other households. This implies that engaging in task-contract casual labor does not reduce the labor input on one's own farm land. On the other hand, there is the possibility that the *timing* of labor input for one's own farm could influence the production level. For example, an employment in weeding at the

Table 6. Task-contracted Casual Labor and Maize Production

	Kachamba		Belo		Horo		Bongololo	
Engagement/non-engagement in task-contracted casual labor	Engaged	Did not engage	Engaged	Did not engage	Engaged	Did not engage	Engaged	Did not engage
Number of households	14	17	16	14	16	16	10	23
Maize production (kg/ha)	872	1,234	483	487	156	423	1,189	1,641
Labor input on maize farming (man days/ha)	209	198	194	124	245	174	176	161
Correlation coefficient between maize production per hectare and labor input per hectare	0.246		0.440*		0.206		-0.121	
Fertilizer input (kg/ha)**	40	90	10	17	54	108	88	72

	Mulawa		Mbila		Total	
Engagement/non-engagement in task-contracted casual labor	Engaged	Did not engage	Engaged	Did not engage	Engaged	Did not engage
Number of households	7	21	18	14	81	105
Maize production (kg/ha)	696	1,531	575	895	622	1,015
Labor input on maize farming (man days/ha)	193	178	223	157	206	162
Correlation coefficient between maize production per hectare and labor input per hectare	0.051		0.205		N.A.	
Fertilizer input (kg/ha)**	67	139	84	128	48	84

* Significant at the 5% level.
** Total application irrespective of types of fertilizer.

employer's farm for a long period of task-contracted labor may delay the timing of weeding on one's own farm, resulting in less optimal production output (Whiteside, 2000). The present study lacks the data to examine this possibility.

FEMALE-HEADED HOUSEHOLDS

This section provides a comparative analysis of labor use between male- and female-headed households. Because of the absence of husbands, female-headed households had fewer economically-active household members and were in a disadvantageous position relative to their male-headed counterparts in deploying family labor for own-farm production. An analysis of female-headed households sheds some light on the important correlations between labor endowments, agricultural production and household livelihood strategies.

As can be seen in Table 7, comparison between male- and female-headed households shows some important differences. First, female-headed households were more likely to engage in agricultural wage labor than male-headed households. Fifty-seven percent of the sampled female-headed household engaged in task-contracted casual labor while only 37% of their male-headed counterparts did. The difference stemmed from the fact that the average household income of female-headed households was relatively low, forcing them to seek other means of income sources.

Table 7. Comparison of Male- and Female-headed Households

		Total	
		Male-headed households	Female-headed households
	Number of samples	126	60
Income	Household income per AEU (Kwacha)	8,927	7,025
	Own-farm income per hectare (Kwacha/ha)	8,420*	4,093*
Household demography	Dependency ratio	1.08	1.39
	Number of household members 15 years old or older	2.5***	1.8***
Assets	Landholding (ha)	1.098***	0.614***
	Value of livestock owned (Kwacha)	14,673	7,875
	Years of education (household heads)	5.5***	3.8***
Own-farm production	Farm areas (ha, including rented land)	1.201***	0.664***
	Maize production per hectare (kg/ha)	1,048***	626***
	Fertilizer use for maize farming (kg/ha)	100**	59**
	Percentage of households growing tobacco	65%	42%

Note: Figures for Kachamba and Belo were converted to 2004/05 prices using rural CPI.
Adult Equivalent Unit (AEU) : male 15 years or older = 1; female 15 years or older = 0.8; male or female 14 years or under = 0.5.
Exchange rates in 2005 were between 115 and 121 Malawi kwacha (MK) per US dollar.
*indicates 10% significance level, **indicates 5% significance level, and ***indicates 1% significance level with t-test.
Dependency ratio = (number of household members below 14 years old and over 64 years old)/(number of household members between 15 - 64 years old)
Average landholding excludes unopened land.

Second, male- and female-headed households showed different performance in agricultural production. Across the six villages, the farm size of male-headed households was significantly larger than that of female-headed households. Better endowments of land and labor in the male-headed households may explain the difference in farm sizes. In addition, maize production per hectare by the female-headed households was less than that by male-headed households. This may be explained by the low level of fertilizer use among the female-headed households who have less income to purchase expensive farm inputs such as fertilizer than their male counterparts.

Tobacco production is more likely to be taken up by male-headed households than their female counterparts (Table 7). This is because tobacco production requires more labor and working capital than other crops. As the female-headed households had less family labor and income, they faced more barriers to entering tobacco production than their male counterparts. In addition, women tended to avoid growing labor-intensive crops such as tobacco because they face difficulties in combining productive and domestic work while few economically active household members are available (Chipande, 1987).

The amount of family labor put into own-farm production per hectare did not show a significant difference between male- and female-headed households (Table 8). Therefore, the observed difference in productivity of maize between the two types of households does not seem to be caused by the difference in the level of labor inputs. As Table 8 indicates, the labor input of the household heads in female-headed households was 41% higher than that in male-headed households. In addition, female-headed households were more likely to use their children's labor for farm work, and the labor input of children was higher in female-headed households than in male-headed households. Thus female-headed households coped with the problem of insufficient family labor by increasing the work days of the household head and the children.

The availability of grown children's labor is particularly important for own-farm production in female-headed households. As discussed, the number of fam-

Table 8. Labor Input on Maize Farm per Hectare, by Source of Labor and Type of Household

		Household head	Wife	Offspring	Sibling	Relatives
Male-headed households	Labor input (man days/ha)	64	58	27	1	4
	Share of total labor input	36%	32%	15%	1%	2%
Female-headed households	Labor input (man days/ha)	90	-	47	4	9
	Share of total labor input	55%	-	29%	3%	5%

		Other	Hired labor	Total	Average size of maize farm
Male-headed households	Labor input (man days/ha)	1	24	179	0.69
	Share of total labor input	0%	13%	100%	
Female-headed households	Labor input (man days/ha)	8	6	163	0.51
	Share of total labor input	5%	3%	100%	

Note: Children under 15 years old are counted as 0.5 man days/ha.

ily members available for labor affects the scope for farm expansion. Moreover, labor contribution from siblings and relatives was limited (Table 8), as farmers preferred working individually with their families to maximize their own production and profits (Davison, 1995). Under these circumstances, the availability of the grown children's labor in the household contributed to the expansion of farm size, as the following case illustrates.

Case: AB was a 44-year-old *de facto* female head of household in Belo whose husband was living with another woman and made no financial or labor contribution to AB's household. She lived with nine children, among whom four were between 15 and 25 years old. With this abundant family labor, she was able to expand her farm plots to 5.42 hectares, the largest among the sample households. The land for new plots was readily available, as she had been allocated a large tract of land in 1984 by her father who had been a village head. The abundant family labor enabled her to carry out all farm tasks without using hired labor.

However, most female-headed households with grown children cannot expand their farms. In the above case, the abundance of uncultivated land in Belo and AB's privileged familial ties enabled her to expand the operations of her farm by opening new plots on the unopened portions of her allotted land. This land-abundant situation is not applicable to most rural areas in Malawi where increasing land-scarcity problems have left little uncultivated land. Instead, where household farm size is limited because of land scarcity, a large number of children in a household can result in less own-farm production per capita. In the future, it may also lead to a further subdivision of already small land to share among the children. Thus an increased number of grown children in female-headed households can contribute to farm expansion in a relatively land-abundant situation, but not in a land-scarce situation.

CONCLUSION

This paper has examined the labor use and labor contracts observed in smallholder agricultural production in Malawi. Despite the diverse socio-economic conditions of six study villages, the paper found some important similarities in labor use in agriculture. It revealed that the characteristics of labor contracts were interrelated with the high risk of agricultural production and the probability of food deficit during the lean season. This interrelation was examined in the case studies of seasonal labor contracts that provided a means of risk sharing for the employers and food security for the laborers. The paper also examined some features of task-contracted casual labor and highlighted the fact that the relations between user and provider of casual labor were interwoven into the wealth differences among the households. Analysis of labor use by female-headed households has revealed that the female household heads and their children spent more days on farm work than did the members of male-headed

households in order to cope with the disadvantage in family labor, and that the low income of female-headed households forced them to rely more on agricultural wage income than their male-headed counterparts. In addition, the paper has suggested that the low agricultural productivity among the households engaged in task-contracted casual labor and female-headed households may not be explained by the level of family labor inputs alone, and factors such as the paucity in working capital to purchase inputs play an important role in determining the levels of productivity.

ACKNOWLEDGEMENT The author would like to thank the two anonymous reviewers of this journal for their valuable suggestions and comments. He is also grateful to the Centre for Social Research, University of Malawi, for providing an excellent research environment during his stay in Malawi. Financial support for this study was provided by the Institute of Developing Economies.

NOTES

(1) *Dimba* refers to the dry-season gardens established in wetlands (called *dambo*) or in streambeds where water is available throughout the year. *Dimba* cultivation was also practiced in other villages studied, but on a much smaller scale both in number and acreage.
(2) "Vernacular land markets" are commoditized transfers of land within the framework of customary tenure. See Chimhowu and Woodhouse (2006) for further discussion.
(3) During the fieldwork, detailed income data (both for farm income and off-own-farm income) were collected for all sampled households. Based on the data, income quartiles were obtained by ranking all sampled households in each village studied according to income per adult equivalent unit and dividing them into four equal groups. Distinction between wealthy and poor households was made according to the income quartiles. For the income disparities among the sampled households, see Takane (2007).
(4) The exchange rate during the survey periods fluctuated between 115-121 Malawi kwacha (MK) per US $1.
(5) These figures were obtained from the Ministry of Agriculture and Food Security.
(6) Burley tobacco is mostly grown by smallholders in Malawi. Production figures were obtained from the Tobacco Control Commission.
(7) One may argue that the risk sharing arrangement is not embedded in the seasonal labor contract but is sought on an *ad hoc* basis after the production failure occurred. My conclusion is that the risk sharing arrangement is embedded in the contracts at least in some cases because there are cases in which employers and laborers agreed that payment in cash is determined *ex post*, as were the cases for (1) and (3).
(8) Since *ganyu* refers to all kinds of piecework, including nonagricultural work, I do not use the word *ganyu* in this section in order to highlight the distinction between agricultural wage labor and nonagricultural wage labor.
(9) One possible explanation for the statistically significant correlation coefficient in the case of Belo is that many households in the village have to establish new farms on unopened land which requires much labor, and the newly established farms produce better harvests due to good soil conditions.

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——— Accepted July 25, 2008

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