Exploring Seasonal Poverty Traps: The ‘Six-Week Window’ in Southern Malawi

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ABSTRACT Conventional wisdom in Malawi holds that seasonal food deficits force smallholders to hire out their labour to buy food during the critical first six weeks after planting, thereby reducing maize yields on their own fields and reinforcing poverty. This model was tested empirically for the Blantyre Shire Highlands using evidence from a panel survey and household case studies. Results showed no significant relationship between the supply of hired labour (ganyu) and the timeliness of weeding for maize, and that timely weeding was not a significant determinant of household maize deficits. This puzzle is explained by the diversification of the rural economy that has allowed households to develop alternative livelihood strategies to cope with maize deficits. Livelihood diversity helped poor households avoid the seasonal poverty trap and also helps explain the paradox of why the poorest region in Malawi escaped the 2001–2002 famine.

I. Introduction

Recent research on African poverty has highlighted the importance of poverty traps (e.g. Barrett et al., 2006). An important cause of such traps is the seasonal nature of smallholder agriculture (Dercon and Krishnan, 2000). One form of seasonal poverty trap occurs when, at a critical point in the growing season, poor households lack sufficient resources for timely crop management, thereby reducing yields and food supply. If repeated, this pattern may trap poorer households in a vicious cycle from which it is hard or even impossible to escape. The classic formulation is found in Chambers et al.:

[T]he start of the rains often brings a crisis for the community because much work is required in the fields to plant the new crops, but at the same time food is short and disease increasingly prevalent … Success with the new crop may depend on making prompt use of the often brief period when the soil is in the right state for ploughing or hoeing … All too often, though, it is the poorer
farmers who are slow in preparing the land, because of inadequate tools, or because they lack draught animals; so it is they who are late putting in their seeds... Thus their harvest is smaller than that achieved by richer neighbours, and the following year, they are more likely to be short of food during the planting season, and may then be forced to buy grain at inflated prices. In these circumstances, the poorer people are often driven to distress sales or borrowing. (Chambers et al., 1981: 11)

Empirical tests of this particular type of seasonal poverty trap are surprisingly hard to find in development literature. Moreover, where such studies were found their conclusions did not necessarily support the existence of poverty traps. Take the case of animal draught-power in the example above. In Bangladesh, where there is a short turnaround time between two rain-fed rice crops, one might expect farmers without a pair of draught animals to experience delays in preparing their land after harvest and so transplant their second rice crop later than others. In fact, they transplant at the same time as everyone else – because there is an efficient market for draught power (Orr et al., 1990). The same is also true for turnaround time between rice and wheat (Islam et al., 2001). Consequently, the existence of this type of seasonal poverty trap is an empirical issue and cannot be taken for granted.

This article explores the nature of the seasonal poverty trap in Malawi, a small, landlocked nation in east-central Africa. Malawi has several merits as a case study. It is exceptionally poor even by African standards, with 52 per cent of the population below the poverty line (GoM, 2005a: 139). Agriculture is highly seasonal, with rainfall concentrated in one short wet season. Household food security depends heavily on maize, which makes up a higher share of the diet than in any comparable African country. Finally, smallholder agriculture relies almost entirely on the hoe, which is likely to lead to a seasonal labour bottleneck.

Here is how the trap is set in the Blantyre Shire Highlands, southern Malawi. After a poor harvest, 7 in 10 households run out of their own maize by October, relying until the next harvest on what maize they can buy with the cash they earn. Planting begins in late November, and households begin to harvest green maize in February, three months before the harvest of the mature crop in May. The first six weeks after planting are critical for maize yields. The current research recommendation is for two weeding operations in sole maize, the first within three weeks and the second within six weeks of planting (MoALD, 1994). One week’s delay in first weeding and two weeks’ delay in second weeding reduces maize yields by one quarter (Chamango et al., 2000). To maximise yields, therefore, the entire area planted to maize must be weeded twice within a six week window. However, the need to earn food by working for others means that smallholders face competing demands on their labour time. Economic logic dictates that immediate consumption needs take priority over future production and timely weeding. The trap snaps shut, condemning smallholders to a perpetual cycle of food insecurity.

This seasonal poverty trap has become part of the conventional wisdom about smallholder agriculture in Malawi.

‘Ganyu’ labour as a coping mechanism pulls farmers further downwards into poverty. Vulnerable groups become entirely dependent on larger farmers for
their food supply during the ‘hungry season’. They are in no position to bargain for better wages. In the meantime, their own farms go neglected (UN/GoM, 1993: 113)

These households are caught in a poverty trap that is familiar throughout rural Africa: being forced into dependence on agricultural labour on larger farms and estates during the farming season, which reduces their own food production, they effectively sacrifice longer-term household food security to meet short-term consumption imperatives . . . it is this – rather than small landholdings and market dependence for food per se – which is the root cause of their chronic food insecurity. (Devereux, 1997: 37)

Recently, ganyu has been incorporated into a wider narrative about why famines happen in Malawi. Ganyu is seen as the only available option for food-deficit households in an increasingly impoverished rural economy characterised by a thin asset base, chronic food insecurity, HIV/AIDS, and systemic risks that hinder the growth of market-based livelihood strategies (Dorward and Kydd, 2004; Ellis et al., 2003; Bryceson, 2006; Bryceson and Fonseca, 2006). ‘In a context of rural economic polarisation, HIV/AIDS and famine, ganyu labour has become a vortex of impoverishment . . . a lifeline turned noose, strangling vast numbers of Malawian peasant households and communities’ (Bryceson, 2006: 199). Increased reliance on ganyu, and the shortage of demand for ganyu in poor seasons reflects the growing vulnerability of rural households which culminated in the Malawi famine of 2001–2002 (Devereux, 2002).

Despite widespread belief in a seasonal poverty trap, its existence in Malawi has never been verified empirically. Assuming they have no other sources of income, it is economically rational for food-deficit households in the southern region to neglect their own fields in favour of ganyu (Alwang and Seigel, 1999). But what happens in practice? Empirical evidence suggests that, given the amount of ganyu they actually do, smallholders have enough labour available both for ganyu and for timely weeding (Leach, 1995). Consequently, ‘the popular assertion that ganyu diverts household labour from subsistence farming is unproven – if one adult goes for ganyu while the others farm their own land, ganyu income might be additional not competitive’ (Devereux, 1997: 45). Determining what smallholders actually do, however, requires micro-level data on labour allocation during the six week window. The objective of this article is to help fill this information gap and verify whether or not a seasonal poverty trap exists in the Blantyre Shire Highlands, southern Malawi. The analysis and conclusions refer to this particular area and should not be generalised.

The next section outlines a simple model of the trap as conventionally understood. Section IV presents results, followed by a discussion in section V. Some policy implications are outlined in section VI. The final section concludes.

II. Defining the Trap

Figure 1 presents a geometric model that makes explicit some of the key assumptions required for the trap to operate. The four quadrants show the interactions between:
(I) household labour supply for weeding; (II) timeliness of weeding; (III) demand for hired labour; and (IV) demand for maize.  

With labour supply curve $S_1$, available labour is maximised and units of labour supplied are at $O-L^3$. At level $O-L^3$, timeliness of weeding is at $T^3$ and 100 per cent of the area planted to maize can be weeded twice six weeks after planting. With a lower labour supply curve ($S_2$), the units of labour supplied fall to $O-L^2$. At level $O-L^2$, timeliness drops to $T^2$ and only 50 per cent of the area planted to maize can be weeded within the optimum time.

The line $OD$ shows household demand for purchased maize, and the line $OG$ the supply of household labour for ganyu for cash to buy maize. When household demand for maize is at $D^3$, the cash required to buy maize can be met with $O-G^3$ units of ganyu labour. This does not reduce the supply of household labour for weeding which remains at $L^3$ and the demand for hired labour ($H$) remains at zero ($H^1$). Consequently, timeliness remains at $T^3$ and all maize can be weeded twice six weeks after planting.

As household demand for maize rises to $D^1$, the units of ganyu required to buy maize rise to $G^1$. This reduces the supply of household labour available for weeding to $L^1$ units. Timeliness of weeding then drops to $T^1$ and less than half of the area planted to maize can be weeded twice within six weeks of planting. To compensate, farmers hire labour. With household labour supply at $L^1$, households must hire $H^3$ units of labour to maintain timeliness of weeding at $T^3$. Households with low food

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**Figure 1.** A geometric model of the seasonal poverty trap, Malawi.
security cannot afford to hire labour, however, and they weed late, reducing maize yields and household food security. As the value of the yield lost by weeding late ($T^3 - T^1$) is greater than the income earned from ganyu ($G^1 - G^3$), households that supply ganyu during the six week window to meet food deficits are trapped in poverty.

The model suggests four hypotheses that can be used to test for a seasonal poverty trap:

1. Households with low food security supply more ganyu labour.
2. Households that weed late do more ganyu than others.
3. Households that weed late do not hire labour for weeding.
4. Economic returns from timely weeding exceed the returns from ganyu.

### III. Data and Methods

**Setting**

The study was made in the Shire Highlands Livelihood Zone, southern Malawi, which has a population of over 1 million (MVAC, 2005). Poverty in Malawi is most acute in the southern region, where in 1998, 7 in 10 people lived below the poverty line (GoM, 2000: 43). The study was carried out in Chiwinja and Lidala villages in Mombezi Extension Planning Area (Traditional Authority Mpama, Chiradzulu District) and Kambua and Magomero villages in Matapwata Extension Planning Area (Traditional Authority Chimaliro, Thyolo District). Rainfall distribution is unimodal with one wet season between November and March. The farming system is maize-based with numerous legume intercrops. Maize is grown on upland fields (munda) and in valley-bottoms (dambo), while vegetables are grown on land that can be irrigated during the dry-season (dimba). In terms of altitude, rainfall and length of growing season, the maize ecology is representative of 40 per cent of the area planted to maize in Malawi (Heisey and Smale, 1995). The study area lies 30 km from the commercial centres of Blantyre and Limbe that provide off-farm jobs and a market for cash crops like burley tobacco, vegetables and grain legumes.

**Data Collection**

Data for this study were collected as part of a larger project on smallholder farming systems. Three main sources were used. The first was a panel survey of 105 farm households covering the three crop years between 1996 and 1999 (Orr et al., 2000). Sampling was not random but over-represented poorer smallholders and female-headed households that were the most likely victims of a seasonal poverty trap. In order to minimise recall bias on labour use and timing of crop operations, the surveys were conducted in the last week of January, approximately eight weeks after maize planting.

The second source was case studies of 15 panel survey households. Three households were purposely selected from each of five representative household groups previously identified through cluster analysis (Orr and Jere, 1999). Case-study households were visited every three to four days during the first eight
weeks after planting in the 1998–1999 crop season. Information on labour allocation was recorded for each day for each working member of the household. Data was weighted by age and sex and converted to standard six hour days for analysis (see Appendix A). Finally, we drew on other research in the study area, particularly case studies of the economics of 24 off-farm and non-farm enterprises (Orr et al., 2001) and on the different sources of income among the 15 case study households (Orr et al., 2000).

IV. In Search of the Trap

Survey Evidence

We begin the analysis with the survey data before moving to the evidence from household case studies.

*Did poorer households do more *ganyu?* Households were divided into terciles according to the number of months they bought maize in the 1997–1998 season (Table 1). The households with the biggest deficits bought maize for almost eight months. Another indicator of poverty was that they applied less fertiliser. Households were asked what strategies they used to buy maize when they ran out. The households with the biggest deficits were significantly more likely than others to buy maize by doing *ganyu* but were also just as likely to hire-in *ganyu* as better-off households. Variations in the supply of *ganyu* labour did not reflect household size, since this did not differ significantly between the groups. On average, households with the largest maize deficits supplied 28 days of hired labour during the six-week window. Differences in the amount of *ganyu* labour supplied were not statistically significant, however. The difference lay in who supplied the labour. Among households with the biggest maize deficits, women and the elderly had significantly higher participation rates for *ganyu* and they also worked a significantly higher number of days as *ganyu* labour.

*Did *ganyu* delay second weeding?* Since most households completed first weeding on time, the analysis was confined to second weeding (known as ‘banking’ or *kubandira*). Households were divided into terciles based on the share of maize that was fully or partly weeded six weeks after planting (Table 2). Although the area planted to maize did not vary between the three groups, there was a significant variation in the timeliness of second weeding. Among households in the first tercile, none of the area planted to maize was weeded twice within six weeks of planting, by which time households in the third tercile had already completed second weeding. What explains this difference in timeliness?

Table 2 shows no clear-cut relationship between the timeliness of weeding and the supply of *ganyu*. Households that weeded late were just as likely to use *ganyu* to buy maize as those that weeded on time. Nor was there a significant difference in the total amount of *ganyu* supplied or in the amount of *ganyu* done by different members of the household. Interestingly, households with the biggest maize deficits (tercile two) were not the slowest to weed. The amount of *ganyu* supplied by this group (30 weighted days) was double that supplied by the other terciles, but because of high
variation in the supply of *ganyu* the difference was not statistically significant. On the other hand, timeliness of second weeding was significantly related to other socioeconomic variables. Generally, households that weeded later ran out of maize...
earlier. They were also significantly more likely to be headed by women, have higher dependency ratios, cultivate a *dimba* garden, use lower fertiliser rates, and spend less cash on fertiliser than households that weeded on time.

Was household labour sufficient for both own-agriculture and *ganyu*? All households had the same stock of family labour available for second weeding, which did not differ significantly between terciles (Table 3). Working six hours a day for five days a week, this was enough (75 days) to meet the labour required to complete second weeding on time (57 days). However, it was not enough to complete weeding on time in addition to *ganyu* (19 days) and days lost to illness (9 days). This was possible only

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Tercile 1</th>
<th>Tercile 2</th>
<th>Tercile 3</th>
<th>All</th>
<th>$P^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Area planted to maize weeded twice within six WAP (%)</td>
<td>0</td>
<td>58</td>
<td>100</td>
<td>53</td>
<td>0.000</td>
</tr>
<tr>
<td>2</td>
<td>Area planted to maize (ha)</td>
<td>0.77</td>
<td>0.71</td>
<td>0.86</td>
<td>0.78</td>
<td>0.525</td>
</tr>
<tr>
<td>3</td>
<td>Sources of cash to buy maize (no.):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sale of crops</td>
<td>9</td>
<td>13</td>
<td>6</td>
<td>28</td>
<td>0.165</td>
</tr>
<tr>
<td></td>
<td><em>ganyu</em></td>
<td>9</td>
<td>13</td>
<td>12</td>
<td>34</td>
<td>0.568</td>
</tr>
<tr>
<td></td>
<td>relatives</td>
<td>8</td>
<td>7</td>
<td>13</td>
<td>28</td>
<td>0.221</td>
</tr>
<tr>
<td></td>
<td>micro-enterprise</td>
<td>7</td>
<td>9</td>
<td>3</td>
<td>19</td>
<td>0.165</td>
</tr>
<tr>
<td></td>
<td>salary</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>12</td>
<td>0.429</td>
</tr>
<tr>
<td>4</td>
<td>Days/<em>ganyu</em>:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elderly</td>
<td>1.6</td>
<td>4.6</td>
<td>3.2</td>
<td>3.1</td>
<td>0.564</td>
</tr>
<tr>
<td></td>
<td>Adult males</td>
<td>6.1</td>
<td>6.5</td>
<td>6.1</td>
<td>6.2</td>
<td>0.994</td>
</tr>
<tr>
<td></td>
<td>Adult females</td>
<td>6.3</td>
<td>5.6</td>
<td>6.8</td>
<td>6.2</td>
<td>0.944</td>
</tr>
<tr>
<td></td>
<td>Adolescents</td>
<td>1.6</td>
<td>5.3</td>
<td>0.7</td>
<td>2.5</td>
<td>0.048</td>
</tr>
<tr>
<td></td>
<td>Children</td>
<td>0.0</td>
<td>1.8</td>
<td>0.4</td>
<td>0.7</td>
<td>0.454</td>
</tr>
<tr>
<td></td>
<td>Unweighted total</td>
<td>15.6</td>
<td>23.7</td>
<td>17.2</td>
<td>18.8</td>
<td>0.569</td>
</tr>
<tr>
<td></td>
<td>Weighted total$^d$</td>
<td>12.4</td>
<td>30.1</td>
<td>14.1</td>
<td>18.8</td>
<td>0.422</td>
</tr>
<tr>
<td>5</td>
<td>Months buying maize (no.)</td>
<td>4.2</td>
<td>5.9</td>
<td>2.9</td>
<td>4.3</td>
<td>0.000</td>
</tr>
<tr>
<td>6</td>
<td>Households buying maize (no.):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>15</td>
<td>25</td>
<td>8</td>
<td>48</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>17</td>
<td>26</td>
<td>11</td>
<td>54</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>24</td>
<td>30</td>
<td>17</td>
<td>71</td>
<td>0.004</td>
</tr>
<tr>
<td>7</td>
<td>Female-headed households (no.)$^e$</td>
<td>26</td>
<td>16</td>
<td>17</td>
<td>59</td>
<td>0.30</td>
</tr>
<tr>
<td>8</td>
<td>Dependency ratio$^f$</td>
<td>0.68</td>
<td>0.88</td>
<td>0.48</td>
<td>0.68</td>
<td>0.064</td>
</tr>
<tr>
<td>9</td>
<td>Fertiliser applied (kg/nutrients)</td>
<td>22</td>
<td>22</td>
<td>38</td>
<td>28</td>
<td>0.024</td>
</tr>
<tr>
<td>10</td>
<td>Cost of fertiliser (MK)$^g$</td>
<td>618</td>
<td>857</td>
<td>1566</td>
<td>1013</td>
<td>0.008</td>
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</table>

Notes: a. Probability of a significant difference between terciles by ANOVA (continuous variables) or Chi-square test (categorical variables); b. Weeks after planting; c. Elderly defined as age 50 and over, adults as age 15–49, adolescents ages 7–14 and children age 6 and below; d. Weights: Elderly, 0.8, adult males, 1.0, adult females, 0.8, adolescents, 0.5, children, 0.3; e. Female-headed households defined *de jure* where head is widowed or divorced or *de facto* where husband is absent for six months of the year or more; f. Adults (aged 15 and over)/children; g. In the 1998–1999 crop year, US$1 = 43 Malawi Kwacha (MK).

if all working members of the household (including children who participated in second weeding) worked six hours a day, six days a week, for the entire six weeks after planting (90 days). Interestingly, households that weeded later lost significantly more days to illness than others. Even without *ganyu*, therefore, households would have found it difficult to weed on time. Indeed, households attributed late second weeding as much to an absolute shortage of labour as to *ganyu*.

Were households that weeded late unable to afford hired labour? Households that weeded late were just as likely as others to hire labour for *first* weeding (Table 4). Differences in timeliness opened up only with second weeding. Households that completed second weeding on time were quicker to hire labour, hiring enough labour to weed one quarter of the area they planted to maize. By contrast, among households that weeded late demand for hired labour never caught up with the rest even at eight weeks after planting, by which time households that weeded on time had completely finished second weeding.

Did late second weeding increase household maize deficits? We tested this hypothesis using multivariate regression analysis. The household maize deficit in the 1998–1999 season was hypothesised to depend on six independent variables (Table 5). These included the number of consumers in the household in that season, the availability of

### Table 3. Labour supply, by timeliness of second weeding, Blantyre Shire Highlands, 1998–1999

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Tercile 1 (n = 35)</th>
<th>Tercile 2 (n = 35)</th>
<th>Tercile 3 (n = 35)</th>
<th>All (n = 105)</th>
<th>$P^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Area planted to maize weeded twice within six WAPb (%)</td>
<td>0</td>
<td>58</td>
<td>100</td>
<td>53</td>
<td>0.000</td>
</tr>
<tr>
<td>2</td>
<td>Labour supply for second weeding (weighted)c</td>
<td>2.48</td>
<td>2.47</td>
<td>2.68</td>
<td>2.54</td>
<td>0.729</td>
</tr>
<tr>
<td>3</td>
<td>Available work-days:d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 days/week</td>
<td>72</td>
<td>73</td>
<td>80</td>
<td>75</td>
<td>0.651</td>
</tr>
<tr>
<td></td>
<td>6 days/week</td>
<td>87</td>
<td>87</td>
<td>96</td>
<td>90</td>
<td>0.651</td>
</tr>
<tr>
<td>4</td>
<td>Own-farm labour requirements (days)e</td>
<td>56</td>
<td>51</td>
<td>64</td>
<td>57</td>
<td>0.345</td>
</tr>
<tr>
<td>5</td>
<td>Weighted work days:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>ganyu</em></td>
<td>12</td>
<td>30</td>
<td>14</td>
<td>19</td>
<td>0.422</td>
</tr>
<tr>
<td></td>
<td>sick</td>
<td>10</td>
<td>12</td>
<td>6</td>
<td>9</td>
<td>0.081</td>
</tr>
<tr>
<td>6</td>
<td>Perceived reasons for ‘late’ second weeding (no.):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sickness</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>11</td>
<td>0.491</td>
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<tr>
<td></td>
<td><em>Ganyu</em></td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>10</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>Labour shortage</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>11</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>Heavy rain</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>0.542</td>
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</tbody>
</table>

Notes: a. Probability of a significant difference between terciles by ANOVA (continuous variables) or Chi-square test (categorical variables); b. Weeks after planting; c. Weights: Elderly, 0.8, adult males, 1.0, adult females, 0.8, adolescents, 0.5, children, 0.3; d. Six-hour days × weighted labour supply available for second weeding; e. See Appendix 1 for calculation.

alternative staple foods such as cassava, and three variables that determined maize production in the previous season (1997–1998): namely the area planted to maize, the share of hybrid maize in the area planted, land-type, the fertiliser rate, and the share of area planted to maize weeded within six weeks of planting.

Since the number of months of maize deficit is left censored at 0 and right censored at 12, the Tobit model was used. The Chi-square value shows the regression model was statistically significant at the 1 per cent level (Table 6). Although the squared correlation between the observed and predicted maize deficit values was 0.19, indicating that the six predictors accounted for only one-fifth of the variability in maize deficits, three coefficients were statistically significant at the 10 per cent level or
better. These all showed the expected signs. Household maize deficit was positively related to the number of consumers in the household: the larger the household, the more quickly it ran out of maize. Also, maize deficit was negatively related to the area planted to maize, and to the fertiliser rate applied to maize. The coefficient on the fertiliser rate variable was significant at the one per cent level, confirming the critical role of fertiliser for maize yields in this region of low soil fertility. The coefficient for the cassava dummy variable was also negative suggesting that households with lower maize deficits substituted cassava for maize to eke out dwindling maize supplies, but not statistically significant. 10

Timeliness of second weeding displayed an unexpected positive sign, but the coefficient was not statistically significant. Neither land-type nor the share of maize planted to hybrid varieties was found to be significant determinants of maize deficits in 1998–1999. Maize production on low-lying dambo land may be lower only in abnormally wet years, whereas the rainfall in the 1997–1998 crop season was evenly distributed. The absence of a significant relationship with hybrid maize may reflect the use of recycled seed or the lack of a significant yield advantage from hybrid seed after controlling for fertiliser rate.

**Case-Study Evidence**

What additional light can the household case studies shed on the relationships between ganyu and food security, and between ganyu and timely weeding?

**Did poorer households do more ganyu?** Figure 2 shows labour allocation per household worker during the six week window. Weighted labour days were normalised by the weighted number of workers in the household to derive labour time on a per worker basis. Households are arranged sequentially by the month they ran out of maize, beginning in June 1998 and ending in February 1999.

When planting began in November, eight of 15 households had already run out of maize, and a further two households ran out in December when weeding reached its peak. Figure 2 shows three households that ran out of maize before November did significant amounts of ganyu.

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**Table 6. Tobit regression estimates of timeliness of second weeding and household maize deficit, 1998–1999 (DEFICIT99) (**(n = 102)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Wald t-value</th>
<th>p &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.471</td>
<td>4.99</td>
<td>0.000</td>
</tr>
<tr>
<td>CONSUMERS</td>
<td>0.437</td>
<td>2.53</td>
<td>0.013</td>
</tr>
<tr>
<td>MZAREA</td>
<td>−1.185</td>
<td>−1.91</td>
<td>0.060</td>
</tr>
<tr>
<td>WDWK6</td>
<td>0.007</td>
<td>1.10</td>
<td>0.273</td>
</tr>
<tr>
<td>MVMZ</td>
<td>−0.006</td>
<td>−0.90</td>
<td>0.370</td>
</tr>
<tr>
<td>FERTRATE</td>
<td>−0.034</td>
<td>−4.74</td>
<td>0.000</td>
</tr>
<tr>
<td>DAMBO</td>
<td>−0.006</td>
<td>−0.81</td>
<td>0.422</td>
</tr>
<tr>
<td>CASSAVA</td>
<td>−1.005</td>
<td>−1.63</td>
<td>0.107</td>
</tr>
</tbody>
</table>

*Notes:* Pseudo-$R^2$: 0.19; Log likelihood: 237.193; Chi-square: 27.19, $p > 0.0003$. See Table 5 for variable definitions.
Figure 2. Labour allocation during the six-week window, by maize deficit, 1998/1999.
Household 15, consisting of Bambo B., his wife, and four children, clearly illustrated the relationship between maize deficits and *ganyu*. The large amount of *ganyu* by this household is explained by regular employment on a nearby estate. Their unmarried daughter E. left home at 4 a.m. each day to walk the 11 km to work, which lasted from 6 am–12 noon, when workers received a midday meal, arriving home by 3 pm. This schedule continued six days a week, Monday through Saturday. Including travel time, this gave a workday of 11 hours/day or 66 hours/week. The household had no alternative sources of income to buy maize except gifts, including a 50 kg bag of maize from a programme for malnourished children. Cash income from *ganyu* was vital to keep the family alive.

High levels of *ganyu* were not always justified by the need to ensure food security, however. H14 cultivated 0.3 ha of maize and ran out of food in September. During the six weeks after maize planting, Bambo C. was absent for extended periods, leaving his wife to weed and bank their two gardens alone. Ostensibly, he was helping his widowed sister with weeding and his mother with banking their fields in a village 10 km away. In all, he was absent for about 25 days. From his evasive answers and his wife’s complaints, it was clear that Bambo C. had in fact been doing *ganyu* but was unwilling to reveal this or share his earnings with his wife. Only after Mai C. had complained to his parents did Bambo C. finally agree to provide MK 30 for *ganyu* to assist his wife finish banking and promise to work at home on alternate days. In contrast, H1 did not run out of maize until December and had enough income to buy maize from trading in maize flour, yet supplied 39 days of *ganyu*. Nearly half the *ganyu* was supplied by a son who married later that year and invested his earnings in a new house.

Remarkably, three households (H4, H8, and H9) that ran out of maize by December did no *ganyu* at all while another two (H7 and H10) did very little. Why? Three examples must suffice.

H8 consisted of Mai M., her son, daughter, and three grandchildren of working age. This family ran out of maize in October but did no *ganyu* because it received remittance income from a son living in town. Mai M. also earned cash by brewing local gin (*kachasu*) that was sold from home. H9 comprised two elderly sisters separated from their husbands. The household ran out of maize in December, but neither sister was physically capable of *ganyu* labour in addition to working on their own fields. Instead they bought snuff from the local market and re-sold it within the village. This income was more than enough to keep the household in maize. H7 was headed by an elderly woman and included her polygynous husband and niece. Despite running out of maize in July, five months before maize planting, the family devoted less than 10 per cent of their work time to *ganyu*. During this period the household relied on cash remittances from one son in town and occasional support from two married daughters in the village.

*Did ganyu delay second weeding?* Figure 3 shows labour allocation per household worker arranged according to the area planted to maize and tobacco that had received a full second weeding by the end of the six-week window. Of 15 households, six had weeded less than half the area planted to maize.

Again, we can find cases where *ganyu* definitely delayed second weeding. H3 consisted of Mai M., her four children aged four, seven, 10 and 15, and her elderly...
Figure 3. Labour allocation during the six-week window, by timeliness of second weeding, 1998/1999.
mother Mai H. Normally the household had enough maize to last until January, but in May 1998 most of the crop in their dambo fields was stolen (not an unusual event in this survey village), leaving them with only enough to last until October. How did this family manage to feed itself and find the labour required for weeding during the six week window?

The family did little ganyu in the first two weeks after planting because they bought maize with cash from the sale of poultry. This allowed family labour to be devoted to first weeding. But between weeks three and seven, cash for maize came from ganyu, which reduced work-time on their own fields by about 20 per cent. Even so, the family sometimes went to bed without eating an evening meal. On one occasion, Mai C.’s 15-year-old son did ganyu for MK 10 worth of maize flour when the household had not eaten maize for two days. Demand for ganyu labour tailed off by eight weeks after planting, when the only ganyu available was making sweet potato ridges (kupiza) in the dambo, a back-breaking task that the family preferred to avoid. Instead, Mai M. and Mai H. bought maize by selling fertiliser from the Starter Pack they had each received.

The family used two strategies to minimise the effect of ganyu on the timeliness of weeding. First, they agreed on how to allocate their labour. The household head weeded her own maize field and the tobacco field, while her mother weeded her own maize field. The three children were assigned a small field of their own to weed, and assisted their grandmother. While the household head did not work on her mother’s field, her mother assisted her on the tobacco field but not on her maize field. This division of labour allowed the two women to assist each other without relinquishing control over their own maize harvest. Second, labour supply for ganyu was staggered so as not to unduly delay weeding. During the first eight weeks after planting, the family allocated 25 days (about half their available working days) to ganyu. But on only two of these days was labour devoted exclusively to ganyu. The normal practice was for the household to work on its own fields in the morning and as ganyu in the afternoon. On the 25 days worked as ganyu, the (weighted) working time spent on ganyu (53%) was almost the same as that worked on their own fields. This strategy ensured that work was evenly spread and that weeding was not delayed by any unforeseen interruptions such as sickness, funerals or heavy rain. By contrast, H1 devoted 54 days to ganyu in the first eight weeks after planting. On these days, two-thirds of working time (69%) was spent on ganyu compared to one-third on own-cultivation.

As a result of these two strategies, the available work time on the family’s fields never dropped below 60 per cent, and averaged 80 per cent in weeks four and five. Despite this, by the end of the six-week period half the area planted to maize had not received a second weeding. The family only completed second weeding eight weeks after planting.

By contrast, H4 weeded late despite doing less than one day of ganyu. The family consisted of Bambo B, Mai B., and four young children, two of them of working age. In four of the first six weeks after planting, only half the family’s available labour time was spent in their own fields. Between weeks four to six when the household should have been weeding, 30 per cent of available working time was spent on off-farm activities. This household had a dimba garden. Although households avoided cultivating dimba vegetables during the wet months of
December–February, income from *dimba* crops planted in the dry season came on-stream in December and January. In this household, responsibility for crop sales involved both Bambo B., who sold cabbage, and Mai B., who traded tomatoes and green beans in five local markets, and also spent time in non-farm activities like trading maize and maize bran. All this reduced the family labour time available for weeding maize. Of the three case study households with *dimba* gardens, two (H4 and H5) failed to complete second weeding on time on more than half the area planted to maize.

Other households that weeded late despite doing little *ganyu* included H11, where time was lost nursing a sick child, mourning her death, and attending other funerals, and H10, where timely weeding was not a high priority because all the members of this household either had or were actively seeking non-farm jobs.

Were returns from timely weeding higher than returns from *ganyu*? Information on average daily earnings from a range of economic activities was available for the case-study households during the six-week window (Orr et al., 2001). Returns to labour from agricultural *ganyu* averaged 26 MK/day. Returns from selling maize bran (H4, H10) were marginally higher at 28–35 MK/day. Selling local gin (H8) gave returns of 40 MK/day and selling snuff (H9) in the peak months of December-January gave a return of 69 MK/day. Buying maize in the local market and processing for sale as flour (*ufa*) in town gave returns of 50 MK/day (H1, H10). Finally, returns from semi-professional enterprises like herbal medicine averaged 208 MK/day (H10).

The economic returns from timely second weeding varied according to fertiliser rate (Chamango et al., 2000: 206). For unfertilised maize, with an expected yield of 600 kg ha$^{-1}$ the returns to timely second weeding averaged only 15 Mk/day, which was below the average from *ganyu* (Figure 4). With maize yields at 1,000 kg ha$^{-1}$ returns to timely second weeding averaged 43 MK/day. This was higher than the returns from *ganyu* and from selling maize bran (35 MK/day) and just above the returns from selling local gin (40 MK/day), but it was below the returns from trading maize in town (50 MK/day) and from selling snuff (69 MK/day). Finally, with yields at 1,300 kg ha$^{-1}$ returns from second weeding within six of planting averaged 106 MK/day, which was four times higher than the returns from *ganyu* and double the returns from more profitable types of micro-enterprise.

V. Explaining the Puzzle

The first hypothesis – that households with high maize deficits did more *ganyu* – can be accepted. Households with the biggest maize deficits supplied four weeks of *ganyu* – more than any other group (Table 1). H3, which ran out of maize in October, illustrates how food-deficit households used *ganyu* as a coping strategy. Even among maize-deficit households, however, the supply of *ganyu* was not determined purely by the need to buy maize. In H14, Bambo C. used *ganyu* to generate cash income that was not shared with his wife. Matrilineal inheritance in southern Malawi creates ‘fragile marriages’ with high levels of separation and divorce (Peters, 1997). *Ganyu* gave men in insecure relationships a way to strengthen their bargaining power and assert their economic autonomy within the household.
Figure 4. Returns to labour from timely second weeding compared with returns from alternative employment. *Note:* See Appendix 1 for calculations.
Yet there was no convincing evidence that households that weeded late did more ganyu, or did not hire labour for weeding, or that timely weeding necessarily gave higher returns than ganyu. In this section, we offer several explanations for these puzzling results.

Why Was Late Weeding Not Related to ganyu?

One reason for the lack of any relationship between ganyu and the timing of second weeding is that ganyu was so pervasive. Over half the sample households supplied labour for ganyu during the six week window. This was because by December the majority of households – 7 in 10 – had run out of maize. Ganyu was simply too widespread to help differentiate households that weeded early or late. Moreover, households that had not run out of maize also participated in ganyu. Four in 10 households without any need to buy maize supplied almost two weeks of ganyu during the six week window, mostly by adult males and younger members of the household. Obviously, ganyu among this group was not used as a survival strategy to buy maize. Ganyu labour was usually paid in cash, which made it an attractive strategy for households that wanted disposable income or funds for investment. H1, where the elder son used his earnings from ganyu to marry and build his own house, illustrates ganyu used as an accumulative strategy. An anthropological study in the same study area found that, during the six week window in 1999–2000, only one in five of ganyu transactions was used to buy food: the rest were used to meet the myriad demands of a cash economy – snacks, soap, paraffin, clothes, shoes, business capital, and even school fees (Lawson-McDowall and Chiumia-Kaunda, 2000: 28). 14

The significance of ganyu, therefore, depends on its socioeconomic context (Peters, 1996). Ganyu to buy food has a different meaning from ganyu to buy fertiliser or matches. Crude survey data on ‘Who participates?’ or ‘How many days?’ cannot discriminate between these different meanings. As a result, ‘ganyu’ is too blunt an analytical tool to be correlated with late weeding. The protean nature of ganyu has even led one experienced researcher to question whether it has any value as an analytical category at all (Peters, 1996).

A second explanation lay in the flexibility of ganyu contracts. Ganyu for weeding was normally paid at a fixed rate per maize planting station, a form of payment known as ‘counting’ (kuwerenga). In 1998–1999 this varied from 5–10 tambala for three planting stations (equivalent then to 0.001 US cents), depending on planting density and the weeding of the field. Piecework contracts made it possible for households to choose how much ganyu they did each day. Some worked a full day while others did only a morning or a few hours. This is evidenced by labour allocation among the case-study households. On the days they supplied labour for ganyu, these households worked a weighted average of 4.4 hours, of which 3.8 hours was spent in ganyu and 0.6 hours on their own farm. Moreover, although the hours per day of ganyu varied over the six week window, the hours worked on their own fields did not. The number of hours worked per day as ganyu also differed significantly between men and women, and between different age groups.15 Flexible contracts made it possible to combine ganyu with own agriculture, besides making it easier to ration ganyu according to need and physical ability. As we have seen, household H3 opted to work on their fields in the morning when they were fresh and
reserve ganyu for the afternoon. By contrast, households like H1 that used ganyu as an accumulative strategy were more likely to supply ganyu for the whole day.

A third reason was that weeding was delayed by factors other than ganyu. Households that weeded late lost twice as many days to illness during the six week window as those that weeded on time. Illness in the study villages peaked between December-March, with dysentery and diarrhoea reported to be worst between December and January. Illness reduced household labour supply directly when workers fell sick and indirectly by the need for women to nurse sick children. The effects were clearly seen in particular cases. In H11, days spent caring for a dying child and in mourning occupied the whole family for a week and prevented timely first weeding. The frequency of chronic illness was increased by HIV/AIDS, which reduced labour availability and made new demands on the extended family. In H8, Mai M’s daughter A., who was separated from her husband, became chronically ill at maize planting and died later that year. Chiradzulu district, where two of the study villages are located, has the highest proportion of orphans in Malawi (Benson et al., 2002: 37).16 Widespread morbidity confounded the relationship between late weeding and ganyu, since illness might result in late weeding among households that did not supply ganyu.

However, the main explanation for the absence of connection between ganyu and late weeding lay in the nature of the rural economy. Households did not rely solely on ganyu to cope with maize deficits but had developed a range of strategies that included the sale of crops, micro-enterprise, salary income, and support from relatives. Livelihood diversity prevented any clear correlation between late weeding and ganyu, because households that weeded late often had alternative sources of income. Of 15 case-study households, six had not weeded more than half the area planted to maize by six weeks after planting, yet only three (H3, H14 and H15) relied primarily on ganyu to buy maize. Two relied on selling dimba vegetables (H4, H5) and the other (H10) on non-farm income from trading maize bran and selling herbal medicine. These enterprises were popular because they gave higher returns to labour than ganyu.

**Why Did Households That Could Afford to Hire Labour Weed Late?**

Why did households that weeded late hire labour for the first but not for second weeding? The answer seems to lie in opportunity costs. The reasons are quite technical. First of all, yield losses were higher for late first weeding. A delay in first weeding of only one week caused yield losses of up to 50 per cent, while a two-week delay in second weeding resulted in a yield loss of 25 per cent (Chamango et al., 2000: 206). A second reason is that timely first weeding maximised uptake of fertiliser. Generally, farmers applied fertiliser once as a top-dressing at four weeks after planting.17 This made it rational to prioritise first weeding, when weed-crop competition was highest. Finally, there was a difference in weeding technique. First weeding involved scraping weeds from the ridges with a hoe and depositing them in the furrow to wither and die (kupalira). Second weeding involved scraping soil from the furrow and heaping it around the maize planting station, burying the weeds under a thin covering of soil (kubandira). First weeding required less labour, particularly on heavy soils, and farmers could reduce this further by adopting...
shortcuts like scraping weeds from only one side of the ridge (kusenda) (Orr et al., 2002: 270). All three factors contributed to higher returns from first weeding and explain why farmers were prepared to hire labour to complete this in time.

Why Did Late Weeding Not Reinforce Poverty?

Although agronomists have found a significant relationship between late weeding and yields, there was no discernible relationship between late weeding and household maize deficits (Table 6). Other factors were more important. Given small farm size, high population density, and the dominance of maize in the farming system, timely weeding had less impact on household maize deficits than the area planted to maize, consumers per household, and the availability of maize substitutes like cassava. However, the most important single determinant of household maize deficit was the fertiliser rate. This is unsurprising given the low level of soil fertility in southern Malawi. On-farm trials in the study area showed that farmers who weeded on time but did not apply fertiliser got lower yields than farmers who did not weed on time but used fertiliser (Chamango et al., 2000: 206).

Decision-making for timely weeding is a complex process that varies between fields according to expected yields (Orr et al., 2002). In some cases it was economically rational for farmers to delay or even abandon second weeding. On fields where expected yields were poor (600 kg ha$^{-1}$), the opportunity cost of late weeding was extremely low. The income they might expect to receive from timely weeding was lower than from ganyu and much lower than from non-farm enterprises. On fields where yields were higher (1000 kg ha$^{-1}$), the opportunity cost of late weeding was higher but still comparable to returns from micro-enterprise. Only on fields where yields were reasonably high (1300 kg ha$^{-1}$) was timely weeding clearly more profitable than off-farm employment.

The survey evidence shows that smallholders that weeded on time spent twice as much on fertiliser as others, which would increase returns from timely weeding (Table 2). There is also direct evidence from farmers themselves. Many farmers who participated in on-farm weed trials failed to give their maize crop a second weeding. The most important reason they gave for this – more important than ganyu or other off-farm employment – was that the yield was expected to be poor because of a lack of fertiliser (Chamango, 1999: 70). Where they expected low yields, farmers simply might not bother to weed twice. In the Blantyre Shire Highlands, where soil fertility is low and seasonal rainfall is erratic, the yield threshold required to justify timely weeding might never be reached. Before the introduction of Starter Packs, half the area planted to maize by the survey households received no fertiliser (Orr et al., 2002: 268). Yields also varied according to climatic conditions. In 2005, 69 per cent of rural households in Malawi reported crop losses from drought or floods in the past five years while 26 per cent reported losses from pests and diseases (GoM, 2005a: 136).

VI. Policy Implications

Our findings stand in marked contrast to recent research in the central region that has emphasised the growing dominance of ganyu as a livelihood strategy (Bryceson,
The explanation lies in the different livelihood systems found in these regions. In the Kasungu-Lilongwe Plain, ganyu provides 40 per cent of the food supply for poor households; the corresponding share in the Shire Highlands is only 10 per cent (MVAC, 2005: 9). Similarly, whereas 65 per cent of cash income among poor households in the Kasungu-Lilongwe Plain derives from tobacco, the income portfolio of poor households in the Shire Highlands is evenly split between trade, ganyu, and animal sales (MVAC, 2005: 11).

This has important implications for our understanding of famine in Malawi. The 2001–2002 famine is conceptualised as a Malthusian crisis, exacerbated by mistaken policy choices. Following the South Asian model, vulnerability to famine is seen primarily in terms of population pressure on limited land, which has led to one of the highest population densities in Africa, tiny landholdings, and chronic food insecurity. According to this logic, the area of Malawi most vulnerable to famine is the southern region. Yet the famine of 2001–2002 did not follow the expected pattern. Although the media portrayed the famine as nationwide, deaths from hunger occurred in the central region. The region that most closely resembled Malthusia – the impoverished rural south – escaped unscathed.

This suggests that famine in rural Malawi was not so much the result of income poverty as of the intrinsic vulnerability of specific livelihood systems. As Devereux (1999: 17) points out, vulnerability is a function of two elements: exposure to risk and resilience to shocks. The livelihood system in the Kasungu-Lilongwe Plain generates higher average incomes but leaves households dangerously exposed when things go wrong. By contrast, rural households in the southern region are poorer and have higher maize deficits, but livelihood diversity gives them greater resilience to shocks.

Widespread belief in a seasonal poverty trap has led to initiatives to provide food-deficit households with alternatives to ganyu. However, the results of this study suggest that these may not be very effective in improving the timeliness of weeding or maize yields.

One idea to reduce the need for ganyu is simply to give poor households free maize. Experience shows, however, that this has little effect on the supply of ganyu (Leach, 1995). As we have seen, income from ganyu has many other uses besides buying food. Consequently, giving households free maize acted as an incentive to participate in project activities rather than as a disincentive for ganyu. Another suggestion is to introduce public works programmes (PWP) during the wet season (Whiteside, 2000). Again, this seems unlikely to reduce the supply of ganyu. PWP would offer minimum wages when wages for ganyu are highest. Vulnerable households are less likely to participate because they have fewer members to work on their own farms (Chirwa et al., 2002: 168). PWP would also conflict with other programmes that provided poor households with free fertiliser, since the benefits depend on timely crop management. Finally, financial resources are too limited for PWP to have any significant affect on the labour market.

Even if PWP reduced the need for ganyu, this would not necessarily improve maize yields. Ganyu is not just a cause of low maize yields, but the result. While average yields remain below a certain threshold, the returns to labour cannot justify timely weeding. On the other hand, where smallholders can afford fertiliser to raise maize yields, they will have sufficient incentive to weed on time. Participants in PWP during the six-week window preferred payment in fertiliser rather than in food or cash (Devereux, 1999: 31).
As so often in Malawi, there is no escape from the fundamental problem of low soil fertility. The findings therefore reinforce the urgent need for policy initiatives to improve maize yields among poorer households. Only then will many smallholders have the economic incentive to improve the timeliness of maize weeding.

VI. Concluding Remarks

A re-stated version of the seasonal poverty trap in southern Malawi might go something like this. Most smallholders run out of maize before or shortly after maize planting. This creates a large pool of labour available for ganyu. However, the demand for ganyu is met not just by those who need ganyu to buy food but by others who use it to generate cash income. (This confirms earlier findings by anthropologists, whose significance for the relationship between ganyu and food security has not been fully appreciated.) A potential conflict exists between the allocation of labour for ganyu and maize weeding. However, most smallholders, including those who have run out of maize, successfully complete first weeding within the recommended three weeks of planting. First weeding is given high priority in order to reduce competition from weeds that flush after the planting rains and to ensure optimum uptake of inorganic fertiliser. Competition for family labour between ganyu and off-farm activities becomes evident with second weeding. A gap opens up between households racing to complete weeding within the recommended six weeks after planting and others that lag behind. Three things explain this divergence. One is illness among family members, which may suddenly and unexpectedly reduce the supply of family labour. The second is where households cannot afford fertiliser, in which case ganyu may give higher returns than timely weeding. Finally, households have alternative sources of income besides ganyu that may be more profitable than timely weeding. Consequently, there is no necessary link between ganyu and late weeding. As the returns from off-farm employment may be higher than from weeding on time, late weeding does not necessarily reinforce poverty.

This should not be taken to mean that we regard the seasonal poverty trap as a myth. A single case study cannot – and is not intended to – challenge the existence of such traps in African agriculture, or their importance in specific contexts or for certain households. Rather, it demonstrates that for this type of trap to exist, certain pre-conditions must be met. These include (1) a rain-fed farming system; (2) a seasonal resource constraint; (3) a large proportion of food deficit households; and (4) where the economic benefits from timely crop management exceed those from alternative activities, including ganyu. For the trap to operate, all these preconditions must be met. This is not always the case. Where livelihood systems are diverse, food-deficit households may not be trapped in poverty by the need to supply wage labour, because food security is based on a wide range of coping strategies. The widespread assumption – at least in Malawi – that seasonal poverty traps are universal reflects a lack of knowledge about livelihood systems. With improved knowledge about the diversity of livelihood systems, however, this assumption can no longer be justified. Livelihoods analysis in Malawi has identified no fewer than 17 Livelihood Zones. Other livelihood systems may exhibit the same resilience to food insecurity as the Shire Highlands. The results of this study may encourage researchers to reconsider the existence of seasonal poverty traps elsewhere in Malawi.
Generally, seasonal poverty traps are less likely where rural households have more opportunities for market-based coping strategies. This is true of the Shire Highlands in southern Malawi. Indeed, the very concept of a poverty trap in the southern region is problematic. In the adjacent Zomba district, only a minority of the poorest households studied in 1986 were still poor 10 years later (Peters, 2006: 332). Of course, the same may not be true for other regions where ganyu plays a bigger role in the livelihood system.

Our original objective was to explore the workings of the seasonal poverty trap in southern Malawi. We found no evidence that ganyu delayed weeding or that late weeding necessarily reinforced poverty. This was unexpected, although it is consistent with what we already know about the rural economy in the Blantyre Shire Highlands. It is also consistent with current explanations for the 2001–2002 famine that identify vulnerability with growing reliance on ganyu. Greater livelihood diversity helps explain the paradox of why the poorest region in Malawi escaped the country’s worst ever food crisis. In searching for clues as to why that famine happened, the southern region was the dog that did not bark.

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Notes

1. Literature reviewed by Gill (1991) and Sahn (1989) contained no empirical tests of the archetypal poverty trap outlined by Chambers. A search of mainstream journal literature from the 1990s found articles that analysed seasonality and risk, seasonal labour constraints, and seasonality and wages but none that analysed how labour allocation might reinforce food deficits among rural households.

2. One Indian village study did find evidence of a draught power constraint because owners would not hire out their animals for fear of losing caste by working for others (Bliss and Stern, 1982: 102–103). In this case, cultural factors prevented the emergence of a rental market for draught power. In Africa, the main constraint on rental markets is the short time available for land preparation, which limits the returns to renting-out tractors or oxen (Pingali et al., 1987: 68, 156). Seasonal poverty traps in African agriculture may therefore be more common where tillage depends on oxen rather than the hoe.

3. The poor harvest refers to the 1996–1997 crop season in the study area, when continuous heavy rain delayed weeding, flooded dambo fields, and leached out fertiliser nutrients.

4. Ganyu in this context refers to agricultural employment paid in cash or kind. In practice ganyu is a blanket term that covers a wide range of wage work, including non-farm jobs (Peters, 1996).

5. Households averaged 12 days/month of ganyu between October and February. On farms between 0.25–0.99 ha, this accounted for less than one-quarter of available labour days (Leach, 1995: 19). Even if household labour supply was reduced by illness or if crop management activities were compressed by late rains farms of 0.5 ha (which as a proportion of their labour time supplied the most ganyu) would have more than enough labour both for ganyu and for their own fields (Leach, 1995: 29). This study was made in the 1993–1994 crop year. The supply of ganyu may have risen since then in response to the collapse of smallholder credit and higher fertiliser prices.

6. Supply and demand for hired labour is also determined by the price of maize and wage rates for ganyu. We assume that the price of maize is the same for all households during the six week window. The supply response of ganyu to changes in maize price could be estimated if we had data for more than one year. We collected data on earnings from ganyu but not on wage rates.
7. The data was collected in 1998 before the 2001–2002 famine and when all rural households were allocated Starter Packs of free fertiliser. It is fair to ask whether this might reduce the relevance of our conclusions. Yet the evidence does not suggest these had a significant effect on the market for ganyu, at least in the Shire Highlands. PRA in adjacent Zomba district found a structural shift in the market after the fertiliser price hike in 1996, with sharply reduced demand and increased supply (Devereux et al., 2007: 28). This is inconsistent with evidence of a rise in wage-rates for kuwerenga ganyu in our study area between 1997–1999 and in other areas between 1998–2001 (van Donge et al., 2001: 34). The introduction of Starter Packs in 1998 might have reduced supply among households that used ganyu to purchase fertiliser or hybrid seed but also increased demand for ganyu to weed fertilised maize, so the net effect is indeterminate. Free fertiliser under the Targeted Inputs Programme (2000–2001) had no discernible effects on either supply or demand for ganyu (Levy and Barahona, 2001: 24). The impact of the 2001–2002 famine is discussed in the text and footnote 21 below.

8. The 605 households in the four villages were screened to meet the project’s socioeconomic objective to work with resource-poor smallholders, including women. Households without agriculture as their primary source of income and without cultivable land were excluded from the sample frame. Of the 74 households that participated in research trials, 30 male-headed and 30 female-headed households were randomly selected for survey. A matching sample of 30 male-headed and 30 female-headed households was then randomly selected from households that did not participate in these trials (Orr et al., 1997).

9. ‘Days’ refers here to the number of days that households participated in ganyu and not to standard working days of a fixed duration.

10. In 2004–2005, 51 per cent of households in Chiradzulu district grew cassava; the proportion for the southern region was 25 per cent (GoM, 2005a: 98).

11. Rainfall records for Kamphonje estate, Matapwata EPA, show that the six-week window period between 27 November 1998 and 14 January 1999 had 24 rainy days, including six days where daily rainfall exceeded 35 mm/day. Records for Matambo estate, Mombezi EPA, for the same period show a total of 19 rainy days including nine days where rainfall exceeded 35 mm/day. We are grateful to the owners of these estates for giving us access to this data.

12. We used the mid-point in the rate of payment, namely 7.5 tambala for three planting stations. The recommended planting density for hybrid maize is 44,000 plantings stations per hectare (MoALD, 1994: 45), giving a total payment of 733 MK/ha. On light soils, the labour requirement for weeding and banking has been estimated at 170 hours/ha (Werner, 1987: 170) which gives a rate of 4.31 MK/hour or 26 MK/day. From personal observation, farmers usually planted more densely than the recommended rate. In theory, this would increase labour’s potential earnings from weeding, but employers would also reduce the rate of payment to compensate for easier weeding.

13. This strategy might also backfire. In H8, Mai M.’s husband – her third - generally made himself scarce when there was fieldwork to be done. One morning in October 1999 we arrived to find his belongings dumped outside the front door. He left for town and did not return. Divorce – village style.

14. Livelihood mapping has shown that ganyu is an important source of cash income for ‘middle’ as well as ‘poor’ households in the Blantyre Shire Highlands (MVAC, 2005: 11).

15. In the first six weeks after planting, on days when they participated in ganyu, men did an average of 4.4 hours/day of ganyu labour compared to 3.2 hours/day for women (p = 0.036). Those aged 6–14 did ganyu for 2.2 hours/day, those aged 15–49, 4.3 hours/day, and those aged 50 and over, 2.3 hours/day (p = 0.000). These figures are un-weighted means of labour time and exclude ganyu labour on estates that required significant amounts of travel time.

16. ‘Orphan’ is defined here as children aged 14 or less with a least one parent dead. Nationally, the share of children in this age group with one or both parents dead was 8.5 (Benson et al., 2002: 37). The Integrated Household Survey (IHS) for 2004–2005 gives a figure of 13 per cent for the southern region (GoM, 2005a: 16). One third of all households in the southern region included orphans (GoM, 2005b: 91). Simulations based on the 1997–1998 IHS show that adding one child to a household that already had children reduced income per capita by 19 per cent (Mukherjee and Benson, 2003: 352).

17. Our 1997–1998 panel survey showed that mean time of application for first top-dressing was 4.4 weeks after planting for a sample of 80 plots that received fertiliser. Only 10 plots received a second top-dressing. The recommendation for hybrid maize is to apply a basal dose soon after emergence and one top-dressing after planting for a sample of 80 plots that received fertiliser. Only 10 plots received a second top-dressing.

18. Substituting cassava for maize flour to make porridge (nsima) is a popular coping strategy for maize deficits in southern Malawi (Devereux, 1999: 48).
19. The Starter Pack Scheme, introduced in 1998–1999, gave each rural household enough inorganic fertiliser for 0.1 ha. As a result, the area planted to maize by the survey households that was fertilised rose to 87 per cent (Orr et al., 2002: 268). Analysis of variance showed no significant difference in the mean timing of second weeding between fertilised plots (5.31 weeks after planting) and unfertilised plots (5.26 weeks after planting) in this season ($p = 0.863$).

20. Mortality from the 2001–2002 famine was unofficially estimated at 1000–3000 (Devereux, 2002: 70). No information is available on regional distribution. Deaths were presumably concentrated in Salima and Mchinji districts in the central region, which were the earliest affected and where maize prices reached their highest levels between November 2001 and April 2002.

21. In contrast to the central region, maize production in Blantyre ADD was ‘normal’ in 2000–2001 (FEWSNET, 2002). Revisits made to the 15 case-study households in November 2003 found that of the 11 households with food deficits in 2002, only two believed they had been ‘badly affected’ in 2001–2002 (Orr and Orr, 2003: 20). In short, the south escaped because the maize deficit in 2001–2002 was routine and households had effective strategies for coping with high maize prices. This was bad news for NGOs eager to be seen doing something about the food crisis. Oxfam’s local office in Mulanje district refused to request food aid but was overruled by headquarters in the United Kingdom. By contrast, the Integrated Food Security Project in Mulanje funded by GTZ rejected the need for food aid in 2001–2002, and Germany did not participate in the relief programmes with other donors (Orr and Orr, 2003: 25).

22. Similarly, the Targeted Inputs Programme (2000–2001) discovered that giving free fertiliser to poorer households did not reduce the supply of *ganyu* since ‘so many basic needs (including food) remain unsatisfied that it is still necessary for people to go for *ganyu*’ (van Donge et al., 2001: 35). The same lesson was learned from a review of targeted food security projects a decade earlier (Simler, 1993).

23. Between 1998 and 2001, an estimated 85,000 households benefited from public works programmes. This represented only seven per cent of the 1.2 million households in Malawi living below the poverty line (Benson et al., 2002: 76).

References


FEWSNET. See Famine Early Warning Systems Network.


GoM. See Government of Malawi.


MoALD. See, Ministry of Agriculture and Livestock Development.


MVAC. See, Malawi Vulnerability Assessment Committee.


**Appendix A. Methodological Note**

**Dates**

Households did not necessarily begin planting on the same day. Among the 15 case study households, planting maize for the 1998–1999 season occurred over six days between 23 and 28 November. To calculate weeks after planting, days were divided into seven day weeks starting with the first day of planting for each household and continuing for the next eight weeks. Hence, while the number of days in the six week window is the same for all case study households, the actual dates may vary. Similarly, weeks after planting were measured individually for each of the 105 survey households.

**Activities**

We recorded the activity and hours spent on each activity by each working member of the household for eight weeks. The focus was on economic activity and we did not measure time spent on unpaid housework, domestic activities, or leisure. We did, however, measure time spent on activities that prevented economic activity, such as funerals, sickness, visits to relatives or to town, and heavy rain that prevented agricultural operations like weeding. Activities were grouped into the following 12 categories:
Labour Days

Following Farrington’s (1975) analysis of work duration in smallholder agriculture in Malawi, we used a standard working day of six hours/day. This corresponded closely to the actual duration of working time recorded for the case study households that averaged 5.5 hours/day during the six week window. Work days for different activities were therefore calculated by dividing allocated labour hours by six. Labour days were weighted according to age and sex, using weights of 1.0 for adult males aged 15–50 years, 0.8 for men and women aged over 50 years, 0.8 for adult females aged 15–50 years, 0.5 for older children aged 7–14 years, and 0.3 for younger children aged below seven years. These weights derive from wage differentials observed by Farrington.

Work Days for Own Agriculture

Days required for own agriculture during the six week window were estimated using the labour coefficients measured by Werner (1987). These were: planting maize (20 hours/ha), planting tobacco (80 hours/ha), fertilising (30 hours/ha), first weeding (170 hours/ha), second weeding on light soils (170 hours/ha) and second weeding on clay soils (260 hours/ha). Planting for intercrops was assumed to be the same as for maize (20 hours/ha).

Labour hours required for second weeding were weighted for each household according to the proportion of maize farm planted on light soils (mundu and hillslope) and on heavy clay soils (dambo). The labour coefficient for intercrops was weighted by the share of area planted to maize that was intercropped with beans and pigeonpea, the two major intercrops in the study area. The labour coefficient for fertiliser was weighted according to the area planted to maize that received fertiliser, plus the entire area planted to tobacco. Total working hours were then divided by six to convert to standard labour days.
Available Work Days

The number of work days available to the case study households was based on the number of working members, weighted by age and sex (see above). Not all working members of the household were present throughout the eight week period of labour recording. In the case of polygynous husbands, we counted them as available for work only when they were physically present in the household. In the case of children who were not continuously present, we counted them as present until such time they had definitely left the household and were no longer available for work. This was done on a case-by-case basis.

Returns to Labour for Timely Second Weeding

Chamango et al. (2000: 206) show that a two week delay in second weeding results in a yield loss of 12 per cent for unfertilised maize and a yield loss of 33 per cent for maize fertilised at 50 kg N/ha. We have used a loss rate of 25 per cent for fertilised maize to take account of the lower fertiliser rates used by the sample households. The average maize yields in their study are much higher than those reported for the Blantyre Shire Highlands by the official crop estimates. Therefore, we used a yield range from 600–1300 kg ha\(^{-1}\) to represent variations caused by differences in soil fertility, fertiliser use, and damage from pests and diseases. Yields were adjusted by the mean area planted to maize (0.74 ha) to give household maize production. Maize was valued at the ADMARC price in January 1999 (7.5 MK/kg). Labour required for second weeding was estimated as described above, and is the average for the sample households in Table 2.

Table A1. Returns to labour for second weeding at different levels of maize yield

<table>
<thead>
<tr>
<th>Maize yield (kg ha(^{-1}))</th>
<th>600</th>
<th>1000</th>
<th>1300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area planted to maize (ha)</td>
<td>0.74</td>
<td>0.74</td>
<td>0.74</td>
</tr>
<tr>
<td>Production (kg ha(^{-1}))</td>
<td>444</td>
<td>740</td>
<td>962</td>
</tr>
<tr>
<td>Rate of yield loss (%)</td>
<td>12</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Yield loss (kg)</td>
<td>53</td>
<td>148</td>
<td>325</td>
</tr>
<tr>
<td>Value (MK) @ 7.5 MK kg(^{-1})</td>
<td>398</td>
<td>1110</td>
<td>2438</td>
</tr>
<tr>
<td>Labour required for second weeding (days)</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Returns to labour (MK day(^{-1}))</td>
<td>15</td>
<td>43</td>
<td>94</td>
</tr>
</tbody>
</table>