Assessing Rural Transformations in Lilongwe district, Malawi: IHM evidence

Evidence for Development working paper 2

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Photo: Ken O'Halloran, for Gorta–Self Help Africa

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Assessing the impact of their interventions in the context of rapid social and economic transformations is a major challenge for agencies involved in rural development. The Assessing Rural Transformations (ART) project was designed to address this challenge, investigating practical and credible ways of assessing the impact of development activities. Two approaches were used: the Qualitative Impact Assessment Protocol (QUIP), a tool for self-reported attribution, and the Individual Household Method (IHM), a relatively new approach to measuring and monitoring income at household level.

The IHM allows users to disaggregate and quantify the contribution made by specific project activities to a household's overall economic status and its capacity to access the goods and services required for social inclusion and well-being. It is a tool that can be used to track change at household level and to gain insights into the drivers of change. This information can be used as a guide for further investigations using the most appropriate methodologies, making it an ideal tool for use in the ART project.

This is the second IHM working paper from the ART project, looking at the 'Farm Enterprise Development for Food and Economic Security (FEDFES)' project, located in Lilongwe district in central Malawi. This is a 4-year NGO project, designed to improve food security and increase farm income among smallholder groundnut and soya producers. The project addressed two of the main obstacles preventing smallholders from participating in Malawi's agricultural value chain: problems in accessing reliable, certified seeds and problems in negotiating good market prices. The project worked with a local cooperative (Chikondi) to tackle both of these problems. 300 seed growers were identified, whose role was to provide certified seeds to 2,700 local farmers. 'Lead' farmers were trained in production, processing and storage methods, and support was given to the cooperative in developing a business plan.

Research protocol

As part of the ART project, a series of three IHM studies were carried out in a selected FEDFES project village between November 2012 and August 2014 to track changes in beneficiary and non-beneficiary households, and to gain a deeper understanding of project impacts and the drivers of change among smallholder farmers in the project area.

The individual household method (IHM) was used to collect information on household incomes and economies in the project area. These studies covered the agricultural years February 2011 – January

2012 (full sample), February 2012 – January 2013 (mini-IHM with 30% sample), and February 2013 – January 2014 (full sample).

The research protocol described in *Assessing Rural Transformations in Oromia, Ethiopia: IHM evidence*[1] was followed. Teams were led in the field by experienced IHM practitioners (IHM levels III and IV) who had been trained by Evidence for Development (EfD)[2]. EfD was responsible for the overall direction of the work and for final data checking and analysis.

Location and sampling

The project is sited in Masumbankhunda traditional authority (TA). An initial livelihood zoning exercise established that all project villages fell within the Kasungu plains livelihood zone[3], producing a similar range of crops and livestock, and with similar access to markets and employment opportunities. Maize, groundnuts, sweet potatoes and soya beans are the most important food crops, with surpluses sold for cash. Tobacco is historically the most important cash crop produced in the zone, although production and prices have fluctuated widely in recent years. Because of its proximity to Malawi's capital city, Lilongwe, market demand for vegetables is also high. Livestock kept in the area include cattle and goats, as well as some pigs and chickens.

Next, a list of all villages participating in the project was drawn up, including information on the total number of households in each village and the number of beneficiary households. From this list, potential survey villages were identified based on their size (between 50 and 80 households) and their number of beneficiary households. These criteria were used to allow whole village studies to be carried out within the time available. Around 8 villages were identified that met these criteria. These villages were numbered on pieces of paper, and a final selection was made by taking the first number 'out of a hat'. The selected village was made up of two sub-villages, 'K' and 'P'. A whole village sample was used.

Data collection

Preliminary data was collected from focus groups and key informants at the study site to establish an overview of the local economic and social context. These interviews were repeated for each subsequent round of data collection to update prices and record major events, such as adverse weather conditions. Detailed village maps were drawn on the first visit, showing all households and the names of their household heads. These were checked on subsequent surveys and any changes noted.

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[1] Petty, C. & Ellis, W. (2015) *Assessing Rural Transformations in Oromia, Ethiopia: IHM evidence*, Evidence for Development working paper 1. Available online at http://www.efd.org/reports/assessing-rural-transformations-in-oromia-ethiopia-ihm-evidence/

[2] For more details of Evidence for Development, see: http://www.efd.org/

[3] *Malawi Livelihood Zones* (2015), Famine Early Warning Systems Network (FEWS NET). Available online at http://www.fews.net/southern-africa/malawi/livelihood-zone-map/july-2015

All available households in the study villages were interviewed, following the IHM protocol described in EfD working paper 1[4]. Field workers were trained to cross-question and probe during the interview, drawing on the information collected in contextual interviews and their own observations (for example, if they see fishing tackle around the house and no mention is made of fishing, they should ask who uses the tackle). Where information is unclear or appears contradictory, interviewers are encouraged to engage in an active dialogue with respondents.

Interview data is checked on return from the field and entered on spreadsheets generated by the open-IHM software, uploaded into the project database and preliminary results are reviewed. Where there are obvious errors, forms are cross-checked and, if necessary, households are revisited the following day to resolve queries and collect missing data.

IHM concepts and terminology

In the analysis presented here, income produced or received by the household as food for their own consumption is classified as '**food income**', measured in kcal and distinct from '**cash income**', measured in the local currency. Software designed by Evidence for Development calculates the proportion of the household's total food energy requirement[5] met by its food income and the cost of purchasing the outstanding requirement, based on the mid-year market price of the most commonly consumed local staple foods. Any money remaining from the household's cash income after it has purchased this food is described as '**disposable income**' (DI):

$$\text{Disposable income} = \\ \text{Sum of all household cash income} - ((\text{Household food energy requirement } [kcal] - \\ \text{Sum of all household food income } [kcal]) \times \text{Price per kcal of staple diet})$$

Households that do not have sufficient income to meet their WHO reference standard food energy requirement are considered to be below the food poverty line and to have a negative disposable income. To allow for comparison between households of different size and demography, income is further standardised by '**adult equivalent**'[6], giving **disposable income per adult equivalent** (DI/AE). Figures that are not standardised per adult equivalent may be described as '**raw**'.

A '**standard of living threshold**' (SoLT) was set for the locality, representing the cost of a basket of essential items that are required to meet the local norms for social inclusion. When calculating each household's cost of meeting the standard of living threshold, personal costs (such as clothes, primary school costs, etc.) are allocated according to the age and gender of individuals in the household; other costs such as fuel are allocated per household. Households that cannot afford the full set of items are described as being below the standard of living threshold.

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[4] Petty, C., & Ellis, W., *op. cit.*

[5] Food energy requirements derived from 1985 WHO reference standards: 'Energy and protein requirements', *Report of a Joint FAO/WHO/UNU Expert Consultation* (1985), World Health Organization Technical Report Series 724. Available online at http://www.fao.org/docrep/003/aa040e/aa040e00.HTM

[6] The number of adult equivalents per household is calculated as the total household energy requirement divided by the energy requirement of a young adult (2,600 kcal per day).

In each year data was collected for twelve-month periods, covering the most recent local 'agricultural year'. The individual household method and concepts used in IHM analysis are described in more detail in EfD working paper 1[7].

Findings

Findings shown in this report are based on the 2012 baseline data and the 2014 endline studies. The baseline agricultural year, February 2011 – January 2012, ended before any FEDFES activities had taken place. The first households to receive groundnut seeds (in 25 kg quantities) did so in the fourth quarter of 2012, towards the end of the second study year (February 2012 – January 2013), alongside crop husbandry training. These groundnuts were harvested in 2013, with income appearing in household data for the third, endline study year (February 2013 – January 2014).

These households together with other, new beneficiaries received further groundnut seeds in the fourth quarter of 2013, towards the end of the third study year (February 2013 – January 2014). In this round of distributions some households received 30 kg of 'basic' groundnut seeds while others received 25 kg of 'certified' groundnut seeds, and households also received varying combinations of follow-up visits, seed field inspections and trainings in seed multiplication, crop husbandry and value addition. Other households received 25 kg of 'basic' soya seeds. These crops would have been harvested in 2014, but too late for income to appear in the third study year.

Baseline data can therefore be considered to predate the effects of the FEDFES project, while the endline data includes the first groundnut harvest that could be impacted by the project for the first group of beneficiaries.

In the charts that follow, we only include the 40 households for which we have both baseline and endline data without any irregularities. 74 households were interviewed in the 2012 baseline study. 54 of these households were available for interview in 2014 and were also surveyed in that study, together with an additional 7 new households. For 14 households data was incomplete and the discrepancies could not be followed up within the project timeframe.

Of the 40 households included here, 28 households are from village K and 12 from village P. There are 5 beneficiaries from the first round of the groundnuts intervention (3 from village K and 2 from village P) for whom potential project impacts may be shown in the endline data. A further 5 households (2 from village K and 3 from village P) became groundnut beneficiaries in the second round, alongside 1 household (from village K) that became a soya beneficiary, but these interventions occurred too late to meaningfully affect the households' incomes during the endline year.

A 'mini-IHM' (30% sample survey) was carried out in 2013, in the aftermath of the 50% devaluation of the Malawi kwacha. Monitoring data indicates that the devaluation had an impact across the

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[7] Petty, C., & Ellis, W., *op. cit.*

income distribution; the median disposable income of all households fell, and in the poorest quintile there was an increase in the number of households that were unable to meet basic food and non-food needs.

Employment remained overwhelmingly the most important source of cash income, with poorer households earning money mainly from agricultural labour and small amounts of charcoal and firewood sales. Income in the middle quintiles was more varied, including larger volumes of charcoal sales, brewing and other types of petty trade alongside agricultural work. The top quintile includes shopkeepers, petty traders and a teacher. This pattern was seen in all 3 assessments.

Income distribution and standard of living

None of the households included fell below the food poverty line in the baseline year (Fig. 1), but 9 households had disposable incomes of less than 5,000 kwacha per adult equivalent and almost half of the sample – 18 out of 40 households – fell below the local standard of living threshold (Table 1). This includes all of the poorest two quintiles, as well as two households from the middle quintile.

Figure 1: Baseline disposable income per adult equivalent
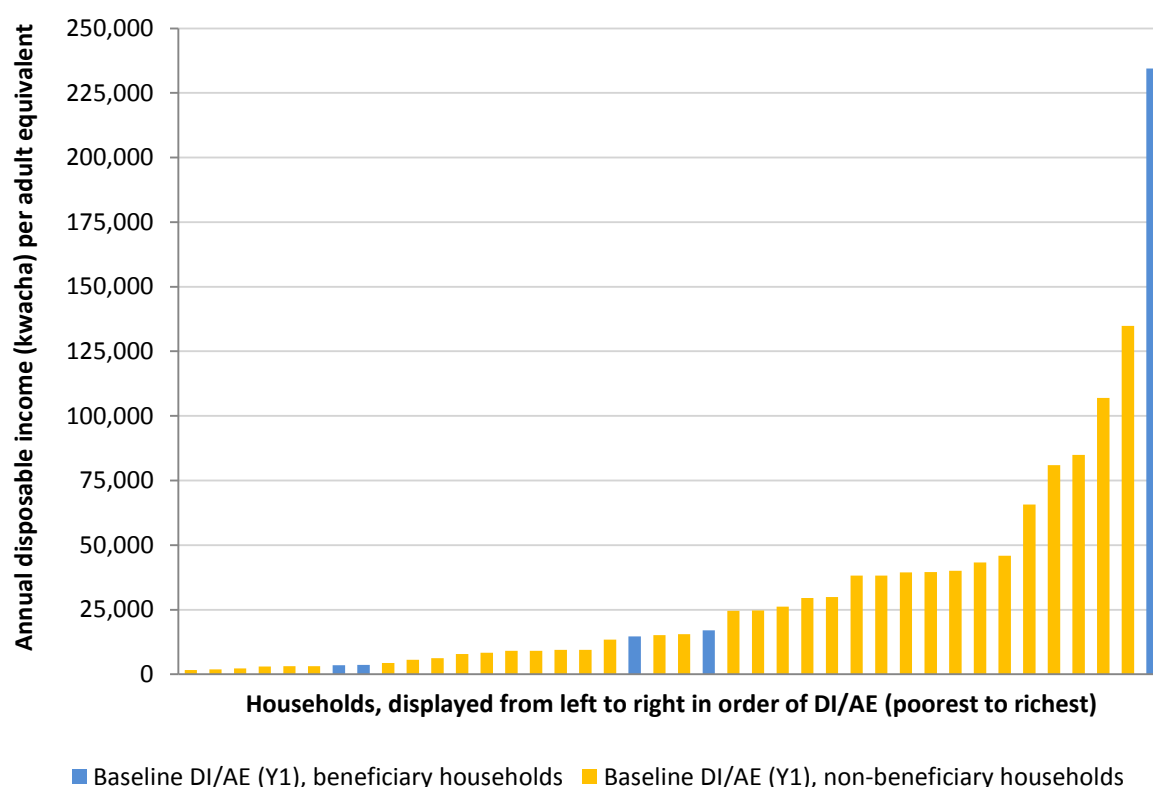
13% (5 out of 40) of the households included were among the first group of groundnut beneficiaries, although project interventions did not begin until after the baseline year. These 5 beneficiary households had a wide range of disposable incomes, including 2 households from the poorest

quintile, 2 from the middle quintile and the household that was by some distance the richest in the sample during the first study year.

	DI/AE quintile					Overall
	1 (poorest)	2	3	4	5 (richest)	
% of HHs below SoLT (no. in parentheses)	100.00% *(8/8)*	100.00% *(8/8)*	25.00% *(2/8)*	0.00% *(0/8)*	0.00% *(0/8)*	***45.00%*** *(18/40)*
% of HHs above SoLT (no. in parentheses)	0.00% *(0/8)*	0.00% *(0/8)*	75.00% *(6/8)*	100.00% *(8/8)*	100.00% *(8/8)*	***55.00%*** *(22/40)*
% of HHs beneficiaries (no. in parentheses)	25.00% *(2/8)*	0.00% *(0/8)*	25.00% *(2/8)*	0.00% *(0/8)*	12.50% *(1/8)*	***12.50%*** *(5/40)*

The beneficiary households' median baseline disposable income was 14,646 kwacha per adult equivalent. This was slightly less than the non-beneficiaries' median 15,479 kwacha per adult equivalent. The 3 poorer beneficiaries were among the households below the standard of living threshold.

Households that became beneficiaries in the second round of project interventions (too late for project impacts to appear in the endline data, and therefore shown here as non-beneficiaries) had a similarly wide range of disposable incomes to the first group of beneficiaries and included at least one household per quintile (with 2 in the second-richest quintile, including the soya beneficiary).

Baseline to endline changes

To compare baseline data (February 2011 – January 2012) with endline data (February 2013 – January 2014), all cash values in the endline data were adjusted (downwards) for inflation, with compound inflation rates derived from the Malawian National Statistical Office's rural consumer price indices[9]. From these calculations, rural year-on-year inflation for February 2012 – January 2013 in Malawi was approximately 21.24%, and the equivalent figure for February 2013 – January 2014 was 24.55%. The compound inflation rate for these two years is 51%.

[8] This table only shows the number of households that were among the first group of groundnut beneficiaries.

[9] **February 2011 – December 2012** inflation rates: 'Consumer Price Index Rural', National Statistical Office (2015). Available online at http://www.nsomalawi.mw/latest-publications/consumer-price-indices/69-consumer-price-index-rural.html
January 2013 – December 2013 inflation rates: 'Consumer Price Indiex Rural 2013', National Statistical Office (2015). Available online at http://www.nsomalawi.mw/latest-publications/consumer-price-indices/198-consumer-price-indiex-rural-2013.html
January 2014 inflation rates: 'Consumer Price Indiex Rural 2015', National Statistical Office (2015). Available online at: http://www.nsomalawi.mw/latest-publications/consumer-price-indices/206-consumer-price-indiex-rural-2014.html

Disposable incomes

Fig. 2 shows baseline (Y1) and endline (Y3) disposable income distributions. Note that while the same 31 households are shown for both years, individual households' income percentiles and quintiles vary between years. Fig. 2 therefore shows changes at an aggregate level within the sample – data showing changes in the disposable income of individual households is presented in Fig. 3.

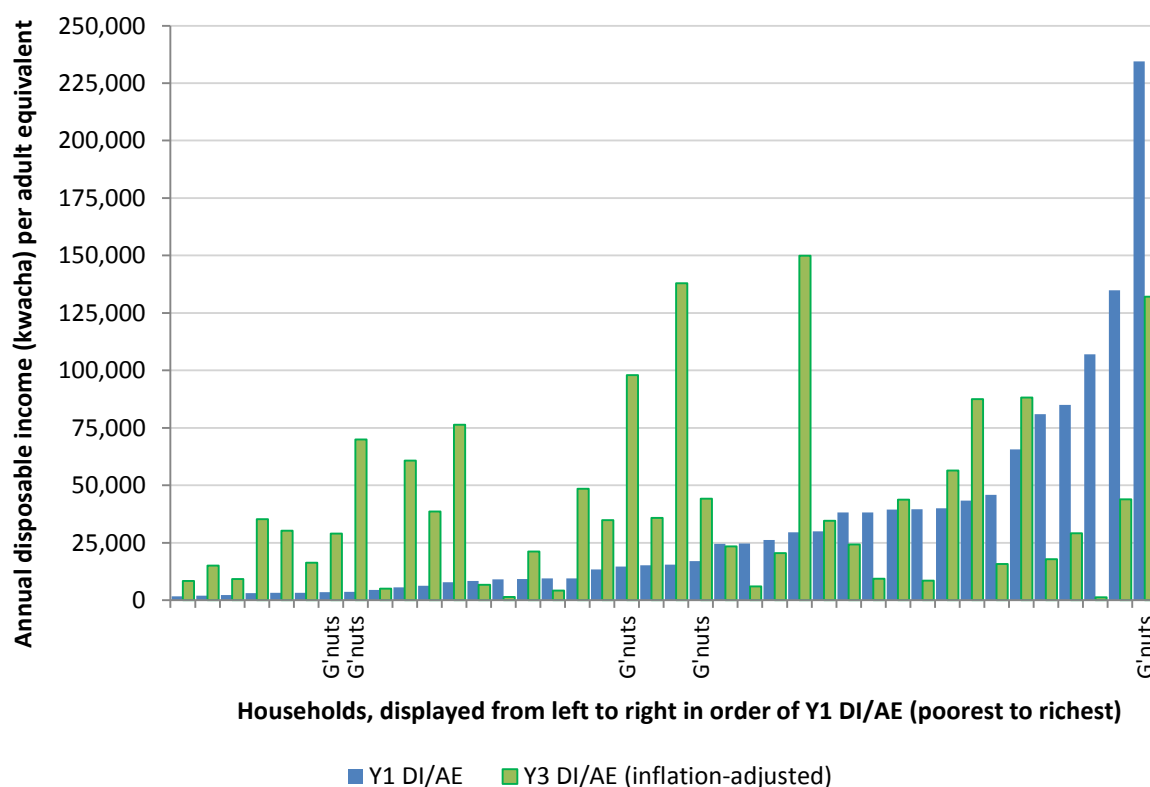**Figure 2: Baseline and endline disposable income distributions**
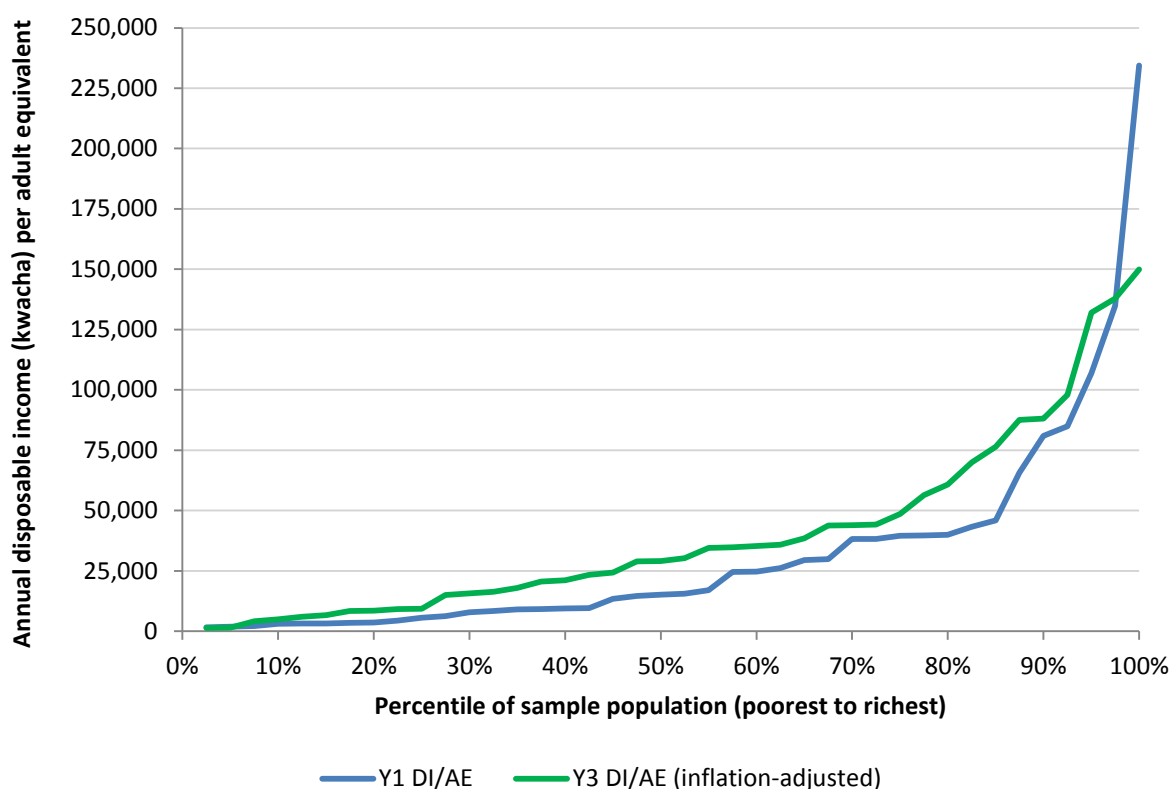
For all but the two poorest households and the richest household, disposable incomes were higher at all points of the distribution in the third, endline year (Fig. 2) despite the adjustment downwards by 51% to account for inflation. Similarly, far more households were able to meet their basic food and non-food needs in the endline year – with 10 more households above the standard of living threshold (Table 2), including all households from the middle quintile. No households were below the food poverty line in either year.

Overall the 5 beneficiary households' relative positions within the disposable income distribution improved between the baseline and endline years, with no beneficiary households in the poorest two quintiles and 3 more in the richest two quintiles in the endline year. However, the beneficiary household that had been the richest in the baseline moved down two places in the endline distribution.

Table 2: Baseline and endline percentages of households above and below the standard of living threshold and beneficiary households, by quintile[10]

		DI/AE quintile					Overall
		1 (poorest)	2	3	4	5 (richest)	
% of HHs below SoLT (no. in parentheses)	Y1	100.00% *(8/8)*	100.00% *(8/8)*	25.00% *(2/8)*	0.00% *(0/8)*	0.00% *(0/8)*	*45.00% (18/40)*
	Y3	87.50% *(7/8)*	12.50% *(1/8)*	0.00% *(0/8)*	0.00% *(0/8)*	0.00% *(0/8)*	*20.00% (8/40)*
% of HHs above SoLT (no. in parentheses)	Y1	0.00% *(0/8)*	0.00% *(0/8)*	75.00% *(6/8)*	100.00% *(8/8)*	100.00% *(8/8)*	*55.00% (22/40)*
	Y3	12.50% *(1/8)*	87.50% *(7/8)*	100.00% *(8/8)*	100.00% *(8/8)*	100.00% *(8/8)*	*80.00% (32/40)*
% of HHs beneficiaries (no. in parentheses)	Y1	25.00% *(2/8)*	0.00% *(0/8)*	25.00% *(2/8)*	0.00% *(0/8)*	12.50% *(1/8)*	*12.50% (5/40)*
	Y3	0.00% *(0/8)*	0.00% *(0/8)*	12.50% *(1/8)*	12.50% *(1/8)*	37.50% *(3/8)*	*12.50% (5/40)*

Figure 3: Baseline and endline disposable incomes by household[11]

■ Y1 DI/AE   ■ Y3 DI/AE (inflation-adjusted)

At an individual household level, there were many fluctuations in disposable income between the baseline and endline years (Fig. 3). The disposable incomes of 80% of the beneficiary households –

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[10] Again, this table only shows the numbers of households that were among the first group of groundnut beneficiaries.

[11] Beneficiary households indicated by a 'G'nuts' label on the *x* axis. Again, as in Fig. 1 and Table 2, households are shown here as beneficiaries only if they were among the first group of groundnut beneficiaries.

the poorest 4 of the 5 – grew, while the majority of non-beneficiaries (60%, or 21 of the 35 non-beneficiary households) also had increases in their disposable incomes. The median change in disposable income per AE for beneficiaries was an increase of 27,166 kwacha, more than four times larger than the median change for non-beneficiaries, an increase of 6,697 kwacha.

All beneficiary households were above the standard of living threshold in the endline year, with the 3 previously below the threshold moving above it. 10 non-beneficiary households also moved above the standard of living threshold in the endline year, with 3 dropping below it after being above in the baseline year.

Project-related income sources

Looking at the underlying income sources contributing to the households' disposable incomes, a rise in cash income from groundnuts accounted for some of the beneficiary households' improved disposable incomes but other income sources were also significant.

All 5 beneficiary households had both food and cash income from groundnuts during both the baseline and endline years. The proportion of non-beneficiary households with food income from groundnuts rose from 66% (23 of 35 households) to 74% (26 of 35 households), meanwhile, and the proportion of non-beneficiaries with cash from groundnut sales rose from 49% (17 of 35 households) to 69% (24 of 35 households).
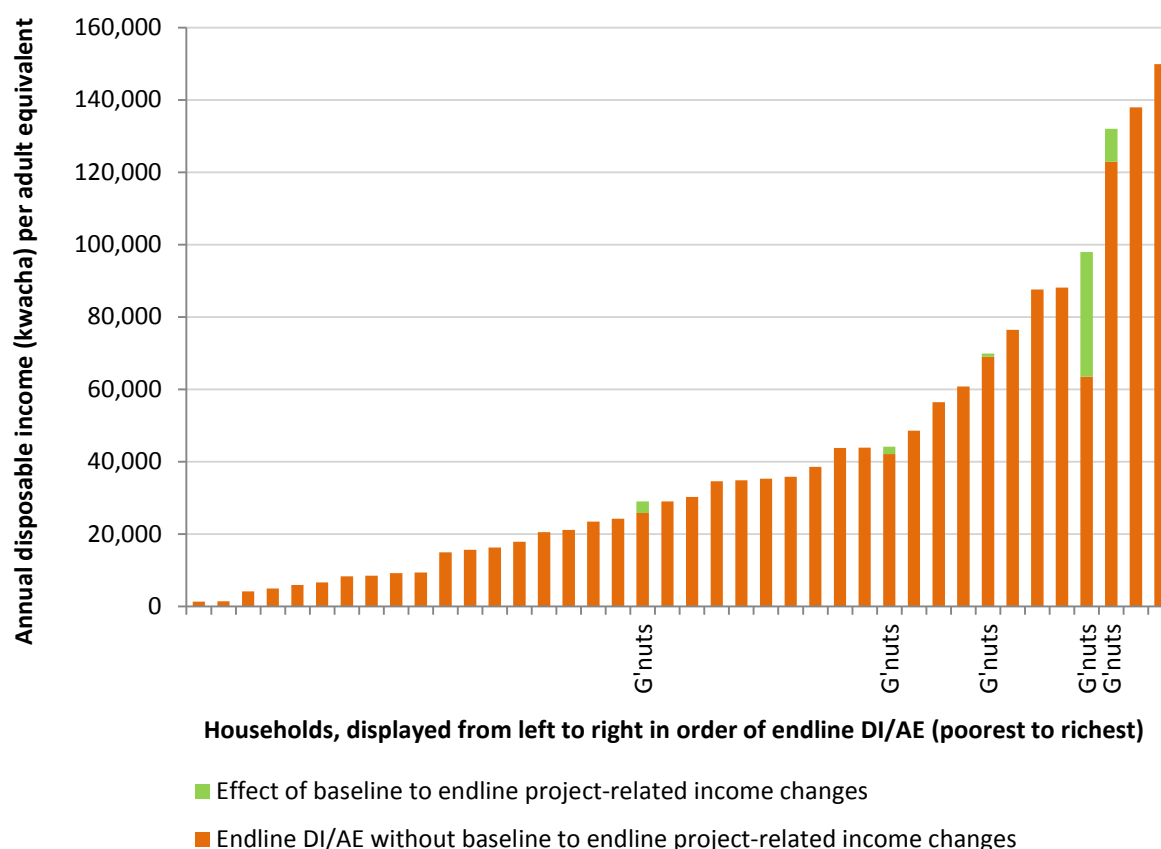
The median food income from groundnuts (i.e. groundnuts produced by the household or received as gifts, but retained for own consumption) of both beneficiaries and non-beneficiaries[12] decreased between the baseline and endline years. The overall fall was less steep among the beneficiaries (from 283,710 kcal to 215,400 kcal) than the non-beneficiaries (from 376,350 kcal to 197,790 kcal).

The beneficiary and non-beneficiary households had identical median cash incomes from groundnuts during the baseline year, at 10,800 kwacha. Both groups' median incomes from these groundnut sales increased in the endline year despite the downward adjustments for inflation. The median inflation-adjusted rise among beneficiaries (53,641 kwacha) was around twice as high as that of the non-beneficiaries (27,168 kwacha). However, the two largest increases (134,433 kwacha and 91,785 kwacha respectively) went to non-beneficiary households.

Not all beneficiary households' groundnut cash incomes rose. 1 beneficiary household's groundnut sales brought them 4,859 kwacha less in the endline after inflation-adjustment – this was the second-richest beneficiary in the baseline study. However, the other 4 beneficiary households saw rises in groundnuts cash income of 4,156 kwacha, 24,768 kwacha, 85,330 kwacha and 88,346 kwacha.

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[12] Medians here and for cash income are 'raw' (i.e. not standardised per adult equivalent) and exclude 0s. Endline cash incomes and the changes between these and the baseline cash incomes are adjusted for inflation.

Figure 4: Effects of 'project-related' income changes on beneficiary households' DI/AE, baseline to endline[13]

Households, displayed from left to right in order of endline DI/AE (poorest to richest)

■ Effect of baseline to endline project-related income changes

■ Endline DI/AE without baseline to endline project-related income changes

The disposable incomes of all 5 beneficiary households were enhanced in the endline year (Fig. 4) by the combined effects of changes in their groundnut incomes and (in one case) by changes in household demography that resulted in lower standardised food energy requirements. The median increase in annual disposable income per adult equivalent was 3,180 kwacha (at PPP rates[14] for the time covered, this converts into US$ as an increase of $41.16) – although the DI/AE of one beneficiary household rose by 34,409 kwacha ($445.40) as a result of these changes.

Other income sources

The groundnuts cash incomes of the beneficiary households accounted for only a slightly higher median proportion of total household cash income than was the case for non-beneficiaries. Cash from groundnut sales amounted to 12% of the beneficiaries' total cash income in the baseline study

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[13] Beneficiary households indicated by a 'G'nuts' label on the *x* axis. Also note that while other charts in this paper are displayed in order of baseline DI/AE, this chart is displayed in order of endline DI/AE, to better demonstrate the impacts of changes in project-related income sources.

[14] The February 2011 – January 2012 purchasing power parity (PPP) exchange rate for these calculations is 77.2533 kwacha = 1 USD, with a weighted calculation derived from the World Bank's 2011 and 2012 PPP conversion factors for Malawi (available online at http://data.worldbank.org/indicator/PA.NUS.PPP), as all endline results shown here are inflation-adjusted for comparison with that period.

and 21% in the endline. Among non-beneficiaries, median cash income from groundnuts was 10% of total cash income in the baseline and 20% of total cash income in the endline.

While increases in cash income from groundnuts contributed to the higher disposable income among the beneficiary group, other income sources were responsible for more of the rise in absolute terms. The median change in total (raw) cash income was 197,000 kwacha among beneficiaries, far higher than the 24,768 kwacha that was their median change in cash income from groundnuts. The non-beneficiary households' median change in total cash income was considerably lower (33,204 kwacha) than that of the beneficiaries, but again this was far higher than their own median change in groundnuts cash income, a 1,120 kwacha increase[15].

However, the beneficiaries were not an entirely homogenous group. For example, although the overall income from groundnuts of one beneficiary household fell in absolute terms, this household also lost two young adult members – and so with fewer mouths to feed, its annual groundnut income per adult equivalent did not fall.

The richest beneficiary household increased both its food and cash income from groundnuts, but a fall in this household's incomes from employment and trade meant that overall its disposable income per adult equivalent fell. In this case, groundnuts provided a buffer against an even greater fall in income and living standards. This household's sources of cash income are shown in Fig. 5 (on the next page).

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[15] Both groups' overall changes in food income from groundnuts followed the same pattern of being part of wider decreases in food income, although the beneficiaries' average decrease in groundnut food income (median 104,220 kcal) was a larger proportion of their overall average change in food income (160,989 kcal) than the non-beneficiaries fall in groundnut food income (median 80,980 kcal, compared to a median 483,129 kcal fall in total food income).

Figure 5: Disaggregated sources of cash income, groundnut beneficiary household
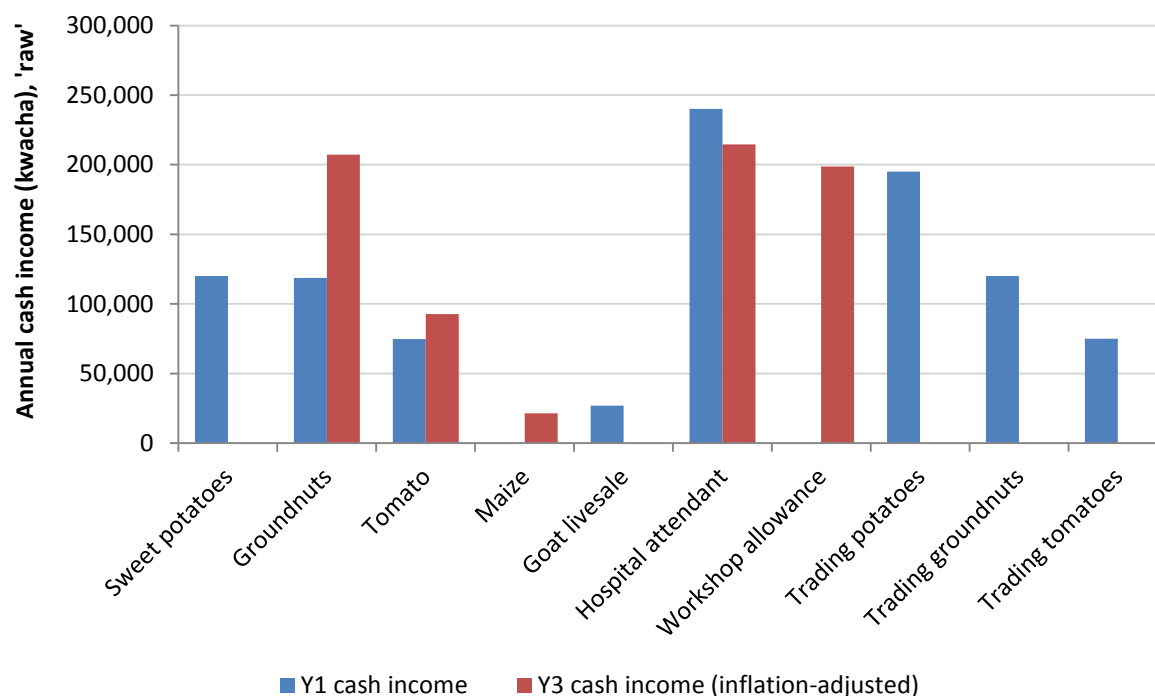
Conclusions

Project staff noted improvements in living standards in project villages, including spending on iron roofing, consumer items such as mobile phones, bicycles and motorbikes, and investment in children's education, consistent with the broad increases in disposable income found here. Analysis from this study demonstrates the complexity of attributing any of these indicators of higher living standards to a single cause. As global markets develop and more consumer goods become available in areas such as Masumbankhunda, which is within 10 km of the boundary of Malawi's capital city, Lilongwe, aspirations and spending patterns change along with households' ability to enter the cash economy and purchase available goods. The groundnut project responds to new opportunities for farming households to engage with this economy. Our research, using both the QUIP and the IHM, is providing new insights into which households are most likely to take up these opportunities and why.