



How Are They Surviving Out There? An Analysis of Total Income in the PARIMA Study Sites

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One of the most commonly used measures of well being in economics is income. In our study area, special care must be taken in measuring income as much of household income is derived from the home consumption of home produced goods. This brief presents some preliminary findings on income generation patterns in the study sites when we attempt to measure total income that includes both cash income and the value of home produced and consumed goods. We find that poverty is more widespread and deep in our Ethiopian sites than our Kenyan sites. We also find that livestock remain central to income generation, and home produced and consumed milk in particular plays a prominent role in ensuring survival. Food aid is found to be an important source of income, but our evidence suggests fears of widespread food aid dependence are not warranted. Income from cropping plays a minor role, and income that comes from salary or wage labor is present in Kenya but almost totally absent in the Ethiopian sites.

Methods

We conducted surveys every three months in five sites in Ethiopia and six sites in Kenya, starting in June 2000 and ending in August 2002 (rounds below will be coded with the first two digits corresponding to the month the survey was launched and the second two digits are the year; 0600 is June 2000 and so on). Household heads were asked to report on all activities that generated cash income such as livestock sales, trade, or working for wages / salary. We also recorded information on household production in the form of milk, home-slaughtered and consumed animals, and harvested crops. For each home produced and consumed item reported, we applied the average price for the commodity observed during that time period in the site where the household resides to approximate the value of this commodity in terms of income. We also applied the market price to any food aid rations that were given to the household in the period, again using observed local market prices. Finally, we calculated the net value of any other transfer in or out of the household (cash gifts, livestock gifts, food gifts) to capture these income flows. Total income was calculated for the household for a three month period in either Ethiopian Birr or Kenyan Shillings. It was then divided by the number of members in the household reported in the survey to arrive at a per capita figure, then by 91.25 (one fourth of 365 days) to state income per capita in per day terms. To compare across countries, income data is then converted to US Dollar equivalents, using an exchange rate of 8.4 Birr and 78 Shillings to the dollar respectively. This brief presents our findings on income levels and income generation patterns in our survey area. See Table 1 (next page) for a list of the sites and site characteristics that led their selection for the study.

Preliminary Findings

Income levels. A striking feature of our findings is that the average total income per person per day in all of our Kenyan sites is larger than that calculated in the Ethiopian sites. Average per capita total income over all observations in Ethiopia is \$0.12, while in Kenya the average is \$0.40. As illustrated in Figure 1, there is more variation over time in the Kenyan average than the Ethiopian average, although the average total income per capita per time period is always greater than the corresponding figure for Ethiopia. The pattern of income in the Kenyan sites is likely related to the drought that gripped the area in 2000, with recovery in 2001-2002. However, the same drought hit in southern Ethiopia, yet there is much less decline or recovery noted in figure one. We can also use the total income figures to calculate some measures of poverty. Using a 50 cent per person per day poverty line, we can derive a poverty headcount index measure of 96% for Ethiopia and 75% for Kenya (at the conventional \$1 per person per day poverty line the corresponding measures are 99% and 92%). A measure of the depth of poverty is the average income shortfall – how much would it take on average to bring a person below the poverty line up to the poverty line. At the 50 cent poverty line, this measure is 41 cents for the average poor person in Ethiopia and 33 cents for the average poor person in Kenya. Both in incidence and depth, poverty is more pronounced in the Ethiopian sites than the Kenyan ones, though by any reasonable measure, there is quite severe poverty in the Kenya sites as well.

The overall country averages also mask some differences across sites as illustrated in Table 2. In this table, average total income for all periods is calculated for each site, and

Table 1. Sites in the PARIMA study.

Site Name	Country	Market Access	Ethnic Majority	Agricultural Potential	Annual Rainfall
Dirib Gumbo	Kenya	Medium	Boran	High	650
Kargi	Kenya	Low	Rendille	Low	200
Logologo	Kenya	Medium	Ariaal	Medium-Low	250
Ng'ambo	Kenya	High	Il Chamus	High	650
North Horr	Kenya	Low	Gabra	Low	150
Sugata Marmar	Kenya	High	Samburu	Medium	500
Dida Hara	Ethiopia	Medium	Boran	Medium	500
Dillo	Ethiopia	Low	Boran	Low	400
Finchawa	Ethiopia	High	Guji	High	650
Qorate	Ethiopia	Low	Boran	Low	450
Wachille	Ethiopia	Medium	Boran	Medium	550

sites are ordered from highest to lowest value. The middle column reports what share of total income is accounted for by cash. The final column reports the calculated Gini coefficient for the distribution of household total income, calculated from the average household total income over all periods. A Gini index measures inequality in income, with a value of 0 corresponding to perfect equality, and 1 indicating extreme inequality.

Although there are important exceptions (Kargi and Finchawa most notably), it appears that greater involvement in the cash economy and higher total income per person per day are positively correlated (using the household level data for all periods, the correlation is 0.06 in Kenya and 0.16 in Ethiopia). It also appears that there is an ambiguous relationship between mean income and income inequality. Though not a perfect fit, it does seem that there may be a relationship between income inequality and rainfall: places with higher rainfall (Sugata Marmar, Ng'ambo, and Finchawa are the highest rainfall sites) are relatively unequal while places with lower rainfall (Kargi and North Horr are the lowest rainfall sites) are relatively equal. Explaining these patterns certainly merits further analysis.

Income Sources. Tables 3 and 4 present the sources of total income. Table 3 presents the per-period average for all Ethiopian sites, and Table 4 shows similar information for the Kenyan sites.

A few general impressions emerge by considering these figures. First, the livestock base of the economy is quite evident: Overall, 66% of total income in Ethiopia and 48% in Kenya comes from livestock (milk, slaughters, and sales). The figures also reveal that milk plays a critical role in income generation in these sites, as it is the largest percent contributor to income in almost all periods in both countries. Livestock sales play an important role as well, but account for a smaller share than milk. It is worth noting that crop harvests play a relatively minor role in income generation. While there are areas where cropping is growing in prevalence, these figures indicate that there is little evidence of a major shift from livestock raising to crop raising in terms of income sources.

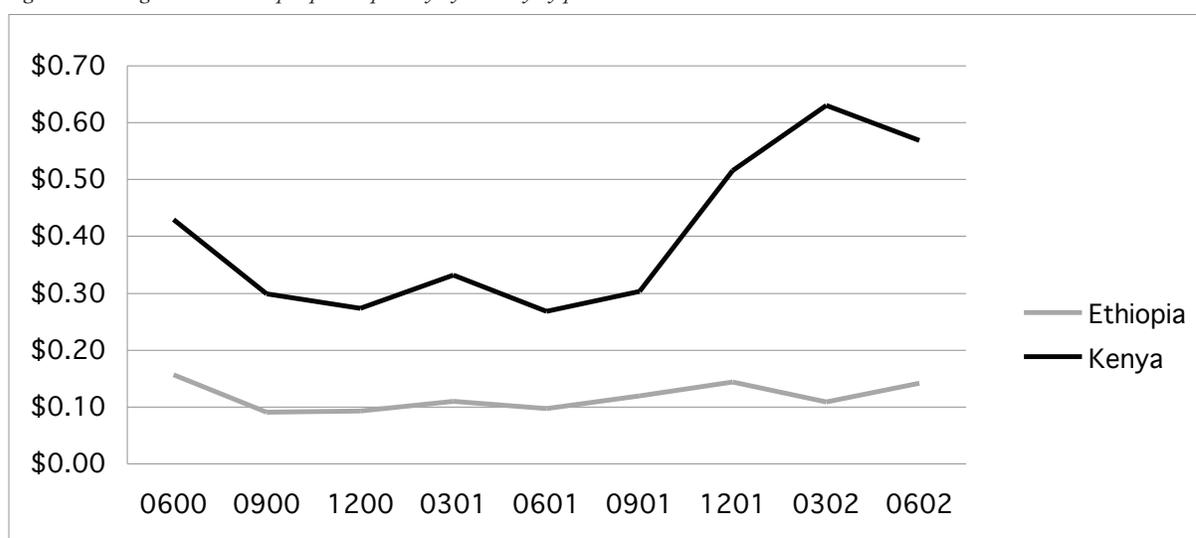
Another message from the figures is that food aid plays an important role in generating total income, but it is not the case that it dominates income generation except in a few specific time periods. Overall, the value of food aid in total income for all periods is 23% in Ethiopia (a

maximum of 50% is reached in September 2000) and 20% in Kenya (a maximum of 35% in December 2000). The first half of the data captures a drought period, and comparing all three figures it seems that food aid prevented Kenyan households from being more severely impacted by the drought and sustained Ethiopian households at a roughly equal level over time. It does not appear to be the case that food aid

Table 2. Total income per person per day by site.

	Average income per person per day over all periods in USD	Cash income share of total income	Gini measure of total income inequality
Kargi, Kenya	\$0.56	28%	0.38
Logologo, Kenya	\$0.50	63%	0.39
Sugata Marmar, Kenya	\$0.45	62%	0.61
North Horr, Kenya	\$0.34	31%	0.30
N'gambo, Kenya	\$0.29	44%	0.47
Dirib Gumbo, Kenya	\$0.26	41%	0.37
Qorati, Ethiopia	\$0.17	9%	0.25
Dida Hara, Ethiopia	\$0.16	20%	0.52
Finchawa, Ethiopia	\$0.11	40%	0.48
Wachille, Ethiopia	\$0.10	22%	0.25
Dillo, Ethiopia	\$0.05	15%	0.34

Figure 1. Average total income per person per day by country by period.



is the sole means of supporting household through the crisis periods – rather, food aid serves as a supplement to household income generation activities. Obtaining wage and salary income is much more pronounced in Kenya than in the Ethiopian sites (14% as compared to 1% for all periods). Similarly, trading generates 9% of total income in Kenya and 2% in Ethiopia. Links to the cash labor economy and markets are clearly more developed in northern Kenya than southern Ethiopia.

Practical Implications

As noted by the income per capita per day figures, even our relatively well off sites are characterized by a great deal of absolute poverty. The incidence and depth of income

poverty are more pronounced in our sites in Ethiopia than those in Kenya, though in both countries there is a case to be made based on these findings that there is a logical connection between development in pastoral areas and the overall goal of poverty reduction.

One practical implication of these findings is that livestock raising is and will almost certainly be the future foundation of the economy of these areas. Pastoral development and poverty reduction can thus be built around this core economic activity. It is notable that milk production plays such a large role in total income generation. It merits further investigation to see whether there are sustainable ways that milk production can be improved by improved feeding, veterinary care and treatment, breeding programs, or other

Table 3. Sources of total income by period in Ethiopia.

	Milk	Slaughter	Livestock sale	Trade	Wage, Salary	Non Food aid Net Gift	Food Aid	Harvest value
0600	33%	2%	17%	2%	1%	0%	46%	0%
0900	23%	1%	22%	1%	0%	1%	50%	2%
1200	37%	1%	16%	1%	2%	1%	41%	1%
0301	26%	0%	18%	3%	3%	1%	23%	26%
0601	58%	0%	16%	4%	2%	1%	17%	2%
0901	49%	1%	13%	2%	1%	2%	18%	15%
1201	65%	1%	25%	3%	1%	3%	2%	0%
0302	79%	0%	8%	3%	2%	5%	2%	0%
0602	71%	2%	11%	2%	0%	1%	4%	8%

Table 4. Sources of total income by period in Kenya.

	Milk	Slaughter	Livestock sale	Trade	Wage, Salary	Non Food aid Net Gift	Food Aid	Harvest value
0600	35%	9%	19%	7%	14%	4%	13%	0%
0900	26%	6%	15%	7%	15%	4%	27%	1%
1200	28%	4%	7%	8%	11%	5%	35%	2%
0301	32%	3%	10%	11%	13%	4%	28%	0%
0601	30%	2%	9%	14%	16%	4%	22%	2%
0901	20%	4%	11%	11%	17%	8%	26%	3%
1201	40%	2%	9%	12%	15%	4%	18%	2%
0302	45%	3%	5%	8%	14%	5%	6%	13%

type of intervention. While improving livestock marketing has received more attention recently, it may also be worth considering ways to improve milk production as well.

Another finding is that food aid dependency is not all that severe a problem. While food aid certainly plays a role in the overall income generation portfolio of people in these areas, it contributes less than they earn from other sources. Finally, connections to the cash economy do not seem to harm household income levels, and in fact are positively correlated with higher total income levels. Beneficial connections to labor markets and trade provide supplemental income streams that should be supported when possible.

Further Reading

McPeak, J. and P. Little, editors. 2006. *Pastoral Livestock Marketing in Eastern Africa: Research and Policy Challenges*. Warwickshire, UK: Intermediate Technology Publications.

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The Pastoral Risk Management Project (PARIMA) was established in 1997 and conducts research, training, and outreach in an effort to improve welfare of pastoral and agro-pastoral peoples with a focus on northern Kenya and southern Ethiopia. The PARIMA project is led by Dr. D. Layne Coppock, Utah State University, Email: Lcoppock@cc.usu.edu. LiTEK is a continuation of the PARIMA project as it enters the write up phase. The LiTEK project is led by Dr. John McPeak, Syracuse University. Email: jomcpeak@maxwell.syr.edu.



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in West and East Africa, Central Asia and Latin America.

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