GLOBAL LIVESTOCK CRSP

In What Ways Are People in Pastoral Areas Integrated into the Cash Economy?

John McPeak, Syracuse University
Livestock Trade in Ethiopia and Kenya Project

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In a prior research brief entitled "How Are They Surviving Out There? An Analysis of Total Income in the PARIMA Study Sites" (GL-CRSP Research Brief 08-02-LiTEK), the author described variation in total income across the eleven PARIMA study sites in southern Ethiopia and northern Kenya. Total income includes both cash income and the implicit cash value of goods that are produced and consumed by the household members without ever entering a market. Further analysis of the data presented in the earlier brief has revealed that access to cash income and access to livestock are key determinants in the generation of total income. In the current brief, focus is placed on how cash income is generated by different livelihood groups in the overall sample. Two important findings are that cash income from livestock and livestock product sales is found to be critical for all groups in the sample and that those with higher cash access are more reliant on wage, salary, business, and trade than those with lower cash access. Detailed findings on access to cash income illustrate that: income from livestock and livestock products is the most equally distributed of the sources considered; income from wage, salary, trade and business income is more unequally distributed; and income from sales of crafts, fuelwood, and water is the most unequally distributed. Two main policy implications are drawn. First, improving cash returns from improving livestock and livestock product markets impacts the largest share of cash income for the overall sample and impacts the type of income that is most widespread amongst the sample. Second, policies that increase access to wage, salary, trade, and business income offer the potential to increase income levels.

Background

In a prior research brief entitled "How Are They Surviving Out There? An Analysis of Total Income in the PARIMA Study Sites" (GL-CRSP Research Brief 08-02-LiTEK), the author described variation in total income across the eleven PARIMA (Pastoral Risk Management) study sites in southern Ethiopia and northern Kenya. Total income includes both cash income and the implicit cash value of goods that are produced and consumed by the household members without ever entering a market. Further analysis of the data presented in the earlier brief has revealed that access to cash income and access to livestock are key determinants in the generation of total income in pastoral areas.

Method. The analysis is conducted by returning to the PARIMA panel data set and recalling the distinction between cash income and total income drawn in the earlier brief. To summarize, total income combines cash income with the implicit value of home produced and consumed goods. Cash income is thus the subset of total income that is explicitly earned in the form of cash. In the overall sample, one third of total income is obtained in the form of cash; the other two thirds are not in the form of cash. As was stressed in the earlier brief, 41% of total income comes in the form of milk, underscoring the importance of livestock in generating income for people in this area.

This brief focuses on patterns in cash generation for the third of total income that comes in the form of cash. The analysis of household income generating strategies being conducted by the LiTEK team is based on dividing up the sample into four livelihood categories. Assignment of a household to one of the four categories is determined by access to two critical variables; cash income per person per day in the household, and livestock per capita in the household. Households are assigned to a category depending on whether the value of each variable is higher or lower than the median for all households in the sample. As this is panel data, the assignment is based on the value of the variable the first time the household was surveyed. Households are in one of four categories: the poorest of the poor (cash lower, livestock lower); those who may be more directly dependent on livestock products without significant market interaction (cash lower, livestock higher); those who may have found income generating activities outside of the livestock sector either by choice or necessity (cash higher, livestock lower); or those who combine higher than average access to the two assets (cash higher, livestock higher).

Major Findings

Table 1 reports the mean cash income for each category, and the coefficient of variation over time for each

Table 1. Mean cash income per person per day in US dollars (and coefficient of variation in income over time) by livelihood category[i].

	Cash Lower	Cash Higher
Livestock Lower	$0.05 (2.08)	$0.14 (1.31)
Livestock Higher	$0.04 (1.75)	$0.20 (1.14)

category. The coefficient of variation is calculated by taking mean household cash income over time and using it in the denominator with the standard deviation of household level cash income over time as the numerator. This generates a household specific coefficient of variation in cash income over time expressed as relative household variability about the household mean. This is then averaged across all households in a livelihood category to generate a representative coefficient of variation for each livelihood category. This illustrates the degree of variation over time in cash income at the household level for the average household in each category. All else equal, a higher coefficient of variation indicates higher vulnerability as it reflects a more variable cash income flow over time.

The values in this table provide two important findings. First, the cash lower - cash higher groups are clearly distinct groups in terms of the means. Cash income levels observed in the first round households were surveyed are therefore good predictors of cash income levels over multiple rounds of the survey; those more involved in the cash economy in the survey observation used to categorize livelihood groups tend to stay more involved in the cash economy in subsequent rounds. This suggests there is some support to the approach used to categorize households with regard to this variable. In contrast, access to livestock is not playing a significant role in determining average cash incomes over time when considering differences in a given column across the rows. Recalling that 41% of total income comes in the form of milk provides a reason that this variable can be used to divide households into livelihood categories. Somewhat more subtly, it is possible to see that household level variation about the mean for cash income is lower for those who are in the higher cash groups, and that it is lowest for those who can be considered the best off (livestock higher, cash higher) and highest for those who are arguably the worst off (livestock lower, cash lower). The difficulties faced by the more disadvantaged groups are not just represented in the lower mean income, but also in greater vulnerability to variation about this mean than better off groups.

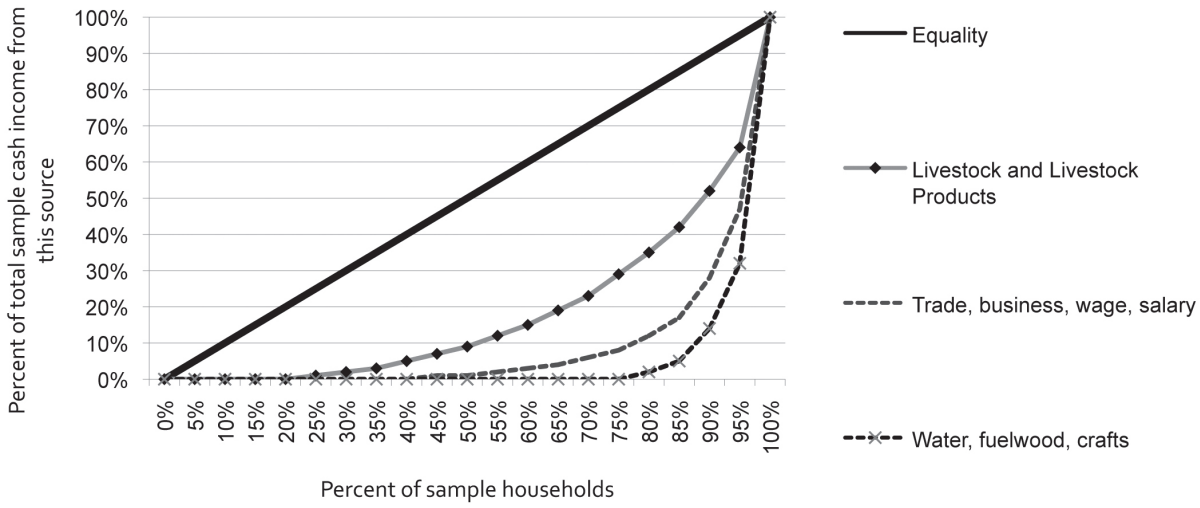
Table 1 provides evidence that access to cash income may differ by livelihood category. Do patterns of obtaining cash income also vary by livelihood category, and do these patterns help understand the difference in access to the cash economy across groups? To begin with, consider the magnitude of combined cash income from each of the following categories for the entire sample: livestock and livestock product sales (60% - 54% from livestock, 5% from milk, and 1% from hides and skins); wage and salary employment (17%); trade and business (12%); net cash transfers (8%[ii]); natural resource harvesting in the form of water sales, firewood or charcoal sales, and craft sales (3%). Wage and salary, trade and business, and net cash transfers will be combined for ease of exposition below. Returning to the livelihood categories allows investigation of how much cash income per person per day is coming into the average household in each livelihood category from these sources. Table 2 presents the cash income per person per day for sources of this income for each category.

The first finding of Table 2 is that livestock and livestock products provide the key link to the cash economy for most study households. This is immediately apparent for the values in Table 2 for all but the cash higher livestock lower group. For this group, the mean wage and salary contribution is higher than livestock and livestock products, but as will be illustrated, there is a great deal of inequality in the distribution of cash income from wage and salary. This inequality leads to the result that even though mean income from wage and salary is higher than livestock and livestock products for this group, median income from each of these sources is equal at $0.02. Another important finding is that the higher cash groups have significantly more non-livestock cash income coming from wage and salary and from trade and business. The two lower cash groups are clearly different from the two higher cash groups in the wage and salary and trade and business columns. Net gifts are modest and seem, if anything, to go to those with more livestock. Finally, no group is making significant cash income from sources such as

*Table 2. Cash income per person per day by livelihood category and source of income. * The numbers in Table 1 and Table 2 are consistent, but do not tally due to rounding.*

	Livestock and Livestock Products	Wage and Salary	Trade and Business	Water, Fuelwood, Crafts	Net gift
Cash lower, livestock lower	$0.03	$0.01	$0.01	$0.001	$0.00
Cash lower, livestock higher	$0.03	$0.01	$0.01	$0.000	$0.01
Cash higher, livestock lower	$0.04	$0.07	$0.03	$0.003	$0.00
Cash higher, livestock higher	$0.08	$0.07	$0.05	$0.003	$0.01

Figure 1. Lorenz curves for distribution of cash income sources across households.



water selling, firewood selling, or craft sales. These activities, which might be seen as potential labor intensive/lower skilled entry points to the cash economy, offer little in the way of significant cash returns overall for any group.

As just discussed, there are reasons that averages as reflected in means may not be fully informative about the impact of different cash income sources if the distribution of this source of income is not widespread across households. This can be illustrated by considering Lorenz curves. A Lorenz curve describes what percent of a total asset (on the y axis) is controlled by what percent of the population (on the x axis), if the population is ordered from left to right by least control to most control. Here, the asset is cash income from a particular source. The closer a Lorenz curve is to a 45-degree line, the more equal the distribution of the asset (on a 45-degree line, 10% of the population controls 10% of the asset; 50% controls 50%, and so on). Figure 1 illustrates Lornez curves for the distribution of livestock and livestock product cash income; wage and salary, trade and business cash income; and income from water, firewood and craft sales across the households of the sample. It is visually apparent that livestock and livestock product cash income is much more equally spread across the households in the sample, while income from the other sources is heavily skewed towards a few households. These curves imply that the upper quartile of each cash source controls: 71% of the income from livestock and livestock products; 92% for the wage and related sources; and 100% for the water and related sources. From another perspective this figure illustrates that: 21% of households earn zero cash income from livestock and livestock products; 45% earn zero from wage and related sources, and 77% earn zero from water and related sources.

Practical Implications

In the preceding brief, the importance of milk produced in generating total income in the PARIMA sample was stressed, suggesting improving milk productivity had the potential to impact many households positively in the study area. Here, the findings are related in that cash income from livestock and livestock product sales is found to be most important, both in terms of the average contribution to income and in terms of how many people are gaining income from this category. Simply put, livestock and livestock products are the core element to how people in pastoral areas generate both total income and cash income. The most effective and direct efforts to increase incomes in this area should therefore target increasing returns to livestock and livestock products. While this may not be surprising, it is still worth stressing that livestock are the key to this economy and to people's well-being within it.

It is also notable that a key distinguishing feature between those with higher cash incomes compared to lower cash incomes is access to the economy through wages, salary, trade, and business. An emphasis on livestock and livestock products is important, but it should not lead development efforts to focus solely on livestock production. Access to the cash economy through formal sector employment or trade and business can be fostered at one level by improving education, at another by developing management skills, and also by improving access to credit that will allow increased investment that will lead to more involvement in the cash economy in these areas. When addressed together, these kinds of efforts offer the promise of improving well-being and reducing poverty and vulnerability of pastoralists in East Africa.

Further Reading

McPeak, J. 2008. "How Are They Surviving Out There? An Analysis of Total Income in the PARIMA Study Sites." *Research Brief 08-02-LiTEK.* Global Livestock Collaborative Research Support Program (GL-CRSP), University of California, Davis.

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

Endnotes

[i] *Denoting the lower cash lower livestock group as 1, the lower cash higher livestock group as 2, the higher cash lower livestock group as 3, and the higher cash higher livestock group as 4, the difference in means is not statistically significant between groups 1 and 2 and between groups 3 and 4. All other comparisons are significant at a 5% or better level. For the coefficient of variation, the differences are statistically different at the 1% level for groups 1 and 4 and 3 and 4, and at the 5% level for groups 2 and 3. Significance is determined by a t-test assuming unequal variances.*

[ii] *In retrospect, researchers were not as precise in wording the question about net gifts as they would like to have been. It is not possible to draw a clear distinction between cash gifts from people resident in the area and outside the area due to the wording of the question. Researchers believe a large part of this can be thought of as urban to rural remittances but do not have the data to distinguish gifts originating out of the community from those originating within the community.*

About the Author: Dr. John McPeak is an Associate Professor in the Department of Public Administration at Syracuse University. Email: jomcpeak@maxwell.syr.edu.

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 led by Dr. John McPeak, Syracuse University, that focuses on issues of livestock marketing and the compilation of PARIMA research findings. 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 East and West Africa, Central Asia and Latin America.

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