**Responding to food insecurity:**

**A case for cash in rural Northern Kenya**

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**Abstract**

Aid agencies, donors, development practitioners and others are increasingly advocating for cash transfers as a substitute or complement to food transfers when responding to both emergency and chronic food insecurity. Yet, cash is not always optimal. Effective market functioning is a necessary - although not sufficient - condition for choosing the most appropriate form of response. The literature, however, remains relatively silent on the context-based determinants of optimal food insecurity responses. In this paper, we use a newly developed response analysis tool, the Marketing Information and Food Insecurity Response Analysis (MIFIRA) framework, to investigate the potential role of cash provision in Marsabit, a semi-arid and arid district of northern Kenya. A considerable number of recipients of both emergency and program food aid live in Marsabit, which is remote, sparsely populated, drought-prone, and infrastructure deficient. Our analysis, resulting from household, market and focus group surveys, indicates markets in Marsabit, under certain conditions, can effectively meet an increase in demand caused by cash transfers and efficiently source and distribute the necessary commodities in good time and without increasing costs. In addition, despite regular and widespread experience with food aid, Marsabit residents overwhelmingly prefer cash or a mix of cash and food.

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# Introduction

Food aid has long been the dominant response to food crises. Yet, food aid has been criticized for its slow delivery, for its lack of flexibility, and for its potential adverse effects on local producers and markets (Meyer, 2007; Harvey, 2007). Increasingly, aid agencies, donors, governments are distributing cash as a substitute or complement to food transfers for social protection programs. The expansion of cash transfers already has changed the face of crisis response and appears to promise greater efficiency and efficacy (Harvey 2007, Devereux, 2005). Growing flexibility in resource options has created an opportunity for operational agencies’ programming to be more responsive to local needs (Maxwell et al. 2009).

Cash-based programming may provide greater flexibility to recipients, support local market development and be faster than securing transoceanic food aid (Ravallion 2003, Rawlings and Rubio 2005, Harvey 2007). Yet, under certain conditions, the provision of cash may not only be less effective than food, but may actually be detrimental to food security. For example, cash may not be appropriate in regions suffering from hyperinflation or price spikes (Basu, 1996).[[1]](#footnote-1) If enough cash is distributed to further fuel price volatility or price increases, non-beneficiary net-consumer households could be left worse off. Conversely, providing food aid can displace local trade and depress local prices. This begs the question: under what conditions is cash best, food best, or a combination of the two best (Gentilini 2007)?

Understanding market functioning is a necessary step in answering the above question. Barrett et al. (2009) write, “As a rule of thumb, food aid is an essential resource for responding to situations that are underpinned by both a *significant food availability deficit* and *market failures* that inhibit adequate and appropriate response by commercial traders” (p. 154). Identifying whether such conditions exist will assist in determining which type of transfer, cash or food, will be most appropriate in a given food insecure situation. The Market Information and Food Insecurity Response Analysis (MIFIRA) framework is a set of guiding questions that examines the likely impact of alternative responses to food insecurity in order to assist operational agencies and others make evidence-based response decisions (Barrett et al., 2009).

In this paper we present an application of MIFIRA in the context of Marsabit District in Northern Kenya, a remote, drought-prone district whose residents have been chronic recipients over the past decade, and where markets are few and far between. Many residents of Marsabit district are long-time recipients of food aid. In fact, communities have ranked food aid as the development intervention with which they have had the most experience. However, residents also give a low rank to food aid’s potential benefit for risk management in the future (McPeak et al., 2009; Mude et al., 2007). We examine whether cash would be an appropriate response to alleviating food insecurity in Marsabit and, if so, the conditions under which this holds true. While cash distributions are increasingly common in agricultural zones with well-developed markets, there is less understanding of market responsiveness in remote and infrastructure deficient pastoral settings.

The remainder of the paper is structured as follows: Section 2 presents the Market Information and Food Insecurity Response Analysis (MIFIRA) framework. Section 3 provides the context of this study, first reviewing Marsabit District’s experience with food aid, and then presenting the study methodology. In section 4, we employ the results of household and trader surveys as well as focus group data, to answer the component questions in the MIFIRA framework. We offer some conclusions in the final section.

# The MIFIRA framework

Response analysis is intended to assist agencies and governments to identify the most appropriate aid response to meet the identified needs.[[2]](#footnote-2) MIFIRA assists in identifying the appropriate response to emergency and chronic food insecurity by evaluating market access and functioning. It presents a series of framing questions intended to guide decision makers’ responses to food insecurity (Barrett et al. 2009). These framing questions extend two core questions that underlie the framework, and, once answered, offer the appropriate response options. These are: 1) Are local markets functioning well, and 2) If markets are not functioning well, is there sufficient food available nearby to fill the gap?

Market functioning is an important factor for decision-makers determining the optimal mode of transfer. In localized food crises where affected households are able to access markets but are without the means (cash) to source food, and where traders are active, responsive and fairly competitive, cash transfers to households should stimulate commercial response. Well-integrated markets would quickly react to the demand generated by cash transfers, and should deliver food much more quickly, efficiently and cheaply to vulnerable households than agencies would deliver food aid. Question 1 of MIFIRA seeks to establish whether indeed markets are capable of reacting to cash transfers in this way.

If, however, markets are inefficient, cash transfers may not generate the necessary market-mediated food supply response and inflation may ensue. These circumstances – a food availability deficit accompanied by market failure - require immediate and certain response with food aid. Where food is available within the country or in nearby countries, local or regional purchases of food commodities are a much faster and more efficient option for procurement than the usual transoceanic procurements. Where analysis under Question 1 deems markets to be ineffective, MIFIRA Question 2 looks at the question of where to source the food required for response, in local and regional markets or via transoceanic shipments[[3]](#footnote-3). Figure 1 provides a stylized graphic of the MIFIRA framework.

In this paper we focus on local market suitability of cash transfers and the conditions under which cash is likely to be effective. Given our cautiously optimistic findings that suggest markets can support cash transfers as a food insecurity response, we do not examine possible source markets for local and regional procurement. As such, we limit our study to MIFIRA’s first question: Are local markets functioning well? Basing our analysis on selected communities in Marsabit district, we study markets, the behavior of market players, households’ interaction with markets, their experience with food aid and their preferences for food insecurity interventions.

# Context, Methodology and Data

## Food security and response in Marsabit

Marsabit, the second poorest district in the nation (KNBS, 2007), is well-suited for the application of MIFIRA. Its population faces recurring drought and has a long history of chronic and emergency food crises. The districts of Kenya’s arid north, including Marsabit, have been the largest recipients of food aid in Kenya in the recent past. Nutritional status, a basic indicator of the severity of food insecurity, is below critical levels (Mude et al, 2009).

We estimate that the population of the larger Marsabit district[[4]](#footnote-4) is 160,000 (KNBS, 1999).[[5]](#footnote-5) While income sources are diverse, pastoralism remains the principal livelihood and source of income in Marsabit district. At least 75 percent of the population obtains more than half of its income from sales of livestock and livestock products as well as home-consumption of livestock products (milk, meat, and blood) (McPeak et al, 2009).

A danger of pastoralism is that livestock face considerable mortality risk, rendering pastoralist households vulnerable to herd mortality shocks. Climate risks - primarily droughts with occasional flooding - are the most severe and constraining risks faced by pastoralists. Droughts increase seasonal hunger by reducing livestock productivity, and by causing a collapse in livestock prices. During droughts, herders try to dispose of emaciated animals all at once, driving down the relative terms of trade between livestock and grain (McPeak 2006, McPeak and Little 2006, McPeak and Doss 2006). Affected households are less able to make purchases of grains and other key commodities and, as a result, may require external food security support.

While there have been numerous interventions and programs to reduce vulnerability, manage food insecurity, and improve welfare, food aid has been the primary response (Little et al., 2008; Mude et al., 2007: Doss et al., 2008). Food aid receipt tops the list of interventions that Marsabit households have had experience with and, for at least 25% of the population, food aid comprises a quarter of their total income (McPeak et al., 2009). Yet, despite the consistent receipt of food aid and on-going food insecurity, households rank food aid as a low-priority welfare-improvement intervention (McPeak et al. 2009, Ouma et al. 2008, Mude et al. 2007). Such household-level findings parallel the growing acceptance and use of cash by aid agencies. Response analysis as set out in the MIFIRA framework can provide analysis-based recommended responses to food crises that are appropriate to the local market context.

## Research Methodology

To solicit the necessary information our survey strategy was three-pronged; a household level survey, a market level survey of key traders, and a community level survey in which previously surveyed households were invited to a structured focus group survey. Five locations across Marsabit District were purposively selected by market access, production system and ethnicity: Dirib Gombo, Kargi, Logologo, Loiyangalani and North Horr. Marsabit Town is the major hub of market activity in the district.

Approximately 40 households per study site were randomly sampled from middle to low wealth classes. In four communities, a previous survey had solicited a complete list of households within the community which indicated, based on key informant knowledge, the relative wealth class (high, medium, low) of households based on their herd holdings. In Loiyangalani, where a comprehensive household list was unavailable, a sample was created from a list of food relief recipients collected at Food Distribution Points operated by the Kenya Red Cross. The household survey, targeted at the household head, a spouse, or suitably competent member of the household collected information on household income and assets, market access, food aid experience, and preferences over various forms of assistance aimed at understanding the determinants of household-level preference over food or cash.

The market level instrument was targeted at traders and designed to elicit information on market characteristics, trader behavior, demand and supply patterns and supply responsiveness among other issues. In each survey area, traders were purposively sampled from among those involved in the sale of at least two major food commodities (e.g., maize, posho, beans, sugar, tea, oil, salt). Sampling was based on the general distance and distribution of villages from the center and on the traders’ volumes. We sampled for three distinct types of traders: wholesalers, retailers, and smaller itinerant retailers without a physical stationary location. Table 1 shows the distribution of trader types by location.

Finally, we carried out focus group discussions (FGD) with the same household survey participants. During the structured FGD, participants discussed market access, development and functioning, and their experiences with food aid operations. We also ran a series of exercises in which households demonstrated their response preference over cash, food, or a mix of both.

# Are local markets functioning well?

We seek to establish whether cash-based response is a feasible, effective tool for addressing a food security crisis and, if so, if this is true for the general populations or only some select sub-locations. We aim to understand the response of food markets in the face of a food crisis and the resulting impact to affected households. To assess whether markets are functioning well, the first MIFIRA question is broken down into five component questions (See Figure 2 for a schematic).

In what follows, we undertake a comprehensive analysis of the five component questions to assess market functioning in Marsabit district. We first discuss household-level questions: “Are food insecure households well connected to local markets”? And, “Do they have a preference over the form/mix of aid they receive”? The second set of questions examines the potential demand effects of a cash transfer and resulting supply response. “How much demand will be stimulated by cash transfers”? And, “Do traders have the capacity to meet this demand” Third, the likely supply response is closely related to the overall market structure and competitiveness and thus we ask, “Do local traders behave competitively?”

The answers to these questions will provide a clear guide as whether markets can support a cash-based intervention, providing insight into what the best response to the situation is: food, cash, or a mixture.

## Market access and household preferences over form or mix of aid

The very real potential for vulnerable sub-populations to be excluded from food markets demands a careful analysis of market participation and access. Restrictive social and cultural norms, great physical distance and safety concerns in response to conflict are some of the factors that could easily conspire to exclude poor households from key food markets. However, if, as Donovan et al., (2005) argue, food insecure households exhibit high levels of market participation prior to a crisis, then unless the crisis directly affects market functioning, households will continue to have adequate access to markets during crisis. In addition, market access and participation influences household preferences over the form or mix of aid they receive. Households that are reasonably confident about purchasing food and other items at fair prices from local markets are more likely to prefer more cash aid.

We start by investigating the levels of market access and participation. Subsequently we examine household preferences and choices over the form of food insecurity response, ultimately analyzing whether these preferences and choices are linked to market access.

### Market access and participation of food insecure households

We define markets as places or centers of food purchase (e.g., a village or town). Market participation describes the degree of interaction households have with traders in markets essential for the purchase of food, while access refers to the ease of reaching markets and engaging in transactions. To investigate relative levels of market participation and reliability, households were asked to indicate the number of regular food markets patronized and the frequency of these visits. Occurrences of market disruptions and commodity shortages were also investigated during in-depth focus group discussions. The resulting statistics are summarized in Table 2.

Results in Table 2 show clear market access and participation patterns at the household level. Proximity and seasonality appears to be strong indicators of market participation. Households in the Loiyangalani area can access 17 different markets, a far larger number than the 5 to 7 markets listed by households in the other study areas. On average, households visit market centers more frequently during the dry season than the rainy season. However, households indicated that the decline in visits to markets during the rainy season is largely because of seasonal increases in auto-consumption of meat and milk products, decreasing the need for food purchases.

Markets also appear to stock food reliably. Logologo and Loiyangalani each reported having temporarily run out of a key staple only once in the last 5 years, the former due to post-election disruption of supply-routes in early 2008 while the latter due to temporarily impassable roads. These shortages were described in focus group discussions as being short-lasting. The remaining three study sites reported consistent general availability over the past 5 years and beyond for common staples. Individuals recalled that the most recent basic food commodity shortage was during the El Nino weather phenomenon of 1997. Heavy rains washed out roads making it difficult for supplies to come in by lorry. Indeed, this was a problem affecting most of the country. Aside from such rare events, temporary scarcity is extremely uncommon and has been quickly resolved.

Changing transport accessibility, food and non-food commodity availability and general access to markets is a useful measure of market evolution and dynamism. Discussed in the 10 community focus group discussions, all respondents agree that it is easier to access markets and transport to major towns than was the case 5 years ago (Table 3). They also agree that non-food commodities have become much more available over the last five years. A small number of respondents argued that rising prices had decreased food availability. These respondents are likely alluding to price increases harming their own purchasing power and thus their personal access to food, not decreasing market availability.

### What limits market access for some household members?

The surveyed respondents throughout Marsabit report high levels of household access and use markets regularly and in some cases daily for food purchases. Yet, household-level responses can mask intra-household variability. We also consider potential barriers to access for specific household members and sub-populations in the community. Respondents ranked factors that could limit food market access for members of their households. The most highly ranked of these factors are illness, followed by age, conflict, gender and bad weather (see Table 4). Significantly, market related constraints to market access such as lack of transport or long distances to markets were not considered important hindrances.

Most households reportedly include certain individuals who face occasional market access constraints. Illness and age are factors that can limit individuals’ access to markets. Many individuals lacking market access solve their access problems by sending a friend, relative, or neighbor to market. Older members rely on younger members to purchase food items, and the healthy can cater to the sick. Indeed, as Table 4 shows, this is the most common solution to this market barrier. Given that the two principal market access obstacles, illness and age, are easily solved by sending a relative or friend to the market, it seems that accessing the market does not seem to present a difficulty for most households.

Some respondents note that market access for women can be constrained, although it is not as prevalently reported as age, illness, and conflict. A concern in distributing cash is that existing cultural practices or social norms that make market access difficult for women may enhance gender disparities (Harvey 2007). However, focus group discussions showed that, largely, the purchase and handling of food is left to women. Respondents who indicated that women occasionally had difficulties accessing markets also explained that women commonly asked relatives, friends, and neighbors to go on their behalf, similar to households with constrained access due to age or illness.

Conflict and bad weather can cause major disruptions to supply systems and prevent households from accessing markets. However, serious conflict and bad weather would also disrupt the food aid supply systems and access to food distribution points in much the same way they would interfere with market functioning. Nevertheless, while the possibility of conflict should not rule out the use of cash in areas of conflict, it is important to carefully monitor conflict as it arises and build flexibility into programs in the event that conflict does result in prolonged inability for recipients to get to markets (Harvey, 2007). Further, given that some households indicate that conflict can limit access to their preferred markets, responses tied to specific markets such as vouchers redeemable in stores in one market center should be avoided. In other words, recipients should be able to use their transfers in any market. This would help to minimize the impact of conflict on market access.

### Household preferences over form or mix of aid

Preferences over the form of aid were assessed through a multi-step process during the individual surveys. First, each respondent was asked if his or her household received food aid and what the estimated value of a typical food aid basket received was. The 9 out of 201 households who had never received food aid estimated the value of a typical aid basket based on their perceptions of the value of the baskets received by their neighbors and relatives. This value varied by household and was necessary to ensure that respondent mental valuations of the food basket and cash were equivalent. The household respondent then indicated whether he or she would prefer a program that continues this food aid, one that included a fraction of aid in cash, or an entirely new program that exclusively gave out cash aid of the value they had estimated.

To ensure that the responses reflected only preferences related to food or cash of the equivalent value, respondents were told that, other than the form of transfer, there would not be any other programming variations such as the delivery mechanism, the household member receiving the cash, etc. None of these respondents were participants in a cash-based food security program during the survey period. Despite this, 31% preferred a complete switch to cash, while 48% chose a mix of cash and some food. Only 20% preferred to receive exclusively food.

### Modeling drivers of preference

Having presented basic market access and food preference statistics, we now estimate the degree to which transfer preferences are functions of market access and participation. In choosing cash, food, or a mix, respondents implicitly express their level of confidence in the market. If respondents did not believe that markets could supply their food needs, they should be less likely to prefer cash. Therefore, we estimate preferences based on market access, market participation and community, household and respondent characteristics.

Our dependent variable is stated food response preference solicited from the household survey as explained above. Given that the dependent variable is categorical and consists of more than two categories (food, cash and mixed), a multinomial logit regression model is the appropriate empirical model to apply. Given the three alternatives in our stated preference variable, we set food transfers as our baseline category and jointly estimate the following model;

 , and  (1)

Table 5 describes the variables used in the model and presents a basic statistic where relevant. The first is the dependent variable representing response choice (31% cash, 48% mix and 20% food) while the rest are the independent variables,.

We present the results of the multinomial logit regression in Table 6. For ease of inference we present the parameters as odds ratios (also known as relative risk) rather than log-odds form. The parameters can now be interpreted as the ratio of the probability of choosing one outcome category over the probability of choosing the reference category. As the multinomial logit assumes the independence of irrelevant alternatives (IIA), we ran the Hausman-based Suest test of the IIA assumption under the null that the choice options are independent of other alternatives. We could not reject the null.[[6]](#footnote-6) To ensure that stated preferences revealed clear differences among the choice options we also ran a likelihood-ratio test against the null that the choice options could be collapsed (i.e., there is no discernable statistical difference between, say, the mix and cash alternatives). For all choice combinations, the null was rejected, signifying the validity of using the multinomial logit for this model.[[7]](#footnote-7)

Using market-based food expenditure quintiles over the course of two weeks as our proxy for market engagement, we find that each extra quintile of food expenditure increases the odds of cash preference over food by 1.98; households who transact more frequently with the market are likely to be more comfortable with market engagement and more confident in the capacity of the market to satisfy all their food needs. Preferences for cash over food differ significantly across locations. Residents of North Horr, the omitted location dummy, are more likely to prefer food over cash when compared with Kargi, Logologo and Loiyangalani. While markets are slowly starting to develop in North Horr, its status as the most distant and remote area in our survey could explain this result.

While food expenditure is a superior proxy of market engagement, market proximity and number of markets frequented by individual households are better indicators of market infrastructure and household access to markets. Decreasing travel time and, separately, increasing number of accessible markets, are both associated with statistically significant increases in the odds of preferring a mix of cash and food over food. A preference for mix suggests that while households may have confidence in their capacity to use cash to purchase necessary products, other non-market considerations result in preferences for a fraction of the aid to be provided as food.

The form of a households’ main source of livelihood may also give an indication of market engagement. We create a dichotomous variable that splits livelihoods into those whose employment requires a certain level of market engagement (e.g., a salaried worker, entrepreneur, casual laborer or the selling of livestock or livestock products), with those with less market oriented positions (e.g., herding livestock, crop cultivation, fishing, and housework). Unexpectedly, households with more market-based livelihoods have lower odds that they would choose cash. One explanation would be that having controlled for food expenditure and elements of market infrastructure, a key difference between these two livelihood types is liquidity: non-market households do not have as much liquidity and thus may be more likely to prefer cash to food.

The foregoing analysis shows that location specific effects and food expenditure are the most significant predictors of a preference for cash. On the other hand, households with better market access (as determined by the number of markets they frequent and their proximity) have a significant preference for mix suggesting that the flexibility offered in a mix of a secure ration of food and the freedom of choice granted by liquidity is highly valued. The desire for at least some food in a response package may reflect the uncertainty posed by the novel provision of cash. Nonetheless, this analysis clearly shows that a preference for food over cash cannot be misconstrued as a perception of market failure. Careful examination of preferences allows us to rule out market access as a driver for food aid preferences. Since market-related variables do not offer a clear signal of preference for cash over food, or vice-a-versa, this suggests that markets are generally perceived to effectively trade cash for food; preferences for food or mix over cash are thus driven by non-market considerations.

## Market capacity and response to cash transfers

Having ascertained the degree of market access, we now examine the capacity of the market to respond to increases in food demand resulting from a cash-based response. Specifically, we investigate: first, what the expected increase in demand for food may be; second, how much additional food traders can supply without driving up prices and; third, whether traders will behave competitively.

### How will local demand respond to cash transfers?

To ascertain whether local markets can efficiently supply food to meet increases in demand, we first estimate the amount that local demand will increase due to cash transfers. Local demand response to cash transfers will depend on several household and programmatic parameters.

First, we estimate household marginal propensity to consume food (MPCF) from an incremental change in income in order to approximate the amount of cash transfer that a recipient household will use to purchase food. To compute the MPCF, we asked each household how they would spend a one-time gift of Ksh2000 and computed the fraction to be spent on food. Column C of Table 7 displays location-averaged marginal propensity to consume food. Households indicate that on average they are likely to spend between 42% and 53% of an additional income increment on food. In other words, these households are likely to spend on food almost half of any one-time cash transfer they receive. Given that a one-time gift could be spent differently than a regularly occurring transfer, we use our elicited MPCF as a lower bound to demand response for food and an MPCF of 75% as an upper bound for demand response for food.

To calculate the total increase in local food demand we then average household own-valuation of the most recent food aid basket for each community (see Column B, Table 7). The values vary widely, between Ksh1142 in Loiyangalani and almost twice that in Logologo. While food aid provision occurs, in our sample, roughly once every two months, we model the inflow as a single payment event. In later steps, we compare traders’ abilities to increase their supply to meet this demand.

To generate the increase in local monthly food demand created by a cash transfer program into these locations, we multiply the estimated household population by the community averaged marginal propensity to consume food and the average value of a food aid basket. As of June 2008, the Kenyan Red Cross delivered World Food Program aid to 63,720 individuals in Marsabit district, roughly 40 percent of Marsabit’s population of approximately 160,000 households.[[8]](#footnote-8) We offer two scenarios; one in which 40% of the total population is covered and the other with full coverage across the entire community. In Columns D, E, G, and H of Table 7, we present the estimated value of increased local food demand resulting from a cash transfer program with the stated characteristics. The lower bound cash transfer valued at the going food basket valuation offered to the entire sub-location population varies between just under a million shillings in Loiyangalani to over 1.5 million in North Horr. The upper bound is between 1.6 million shillings in Dirib Gumbo to 2.2 million shillings in Loiyangalani. The next step is to ascertain whether market traders are able to meet this demand without causing localized inflation in food prices.

### How much additional food can traders supply at or near current costs?

Having determined possible increases to demand, we utilize data from our trader surveys to estimate the capacity of local food traders to meet rising food demand in a timely manner and at current prices. In order to preclude double counting of supply, we focus our analysis only on wholesalers. We consider a wholesaler to be any trader sourcing commodities from suppliers in external markets. By this definition, wholesalers are the principal source of food inflow into the communities. Wholesalers in remote areas sell product not only to consumers but also to some retailers in their communities as well as retailers in satellite markets. Given the small sample of wholesalers - at times only one per community - we employ conservative assumptions when calculating the lower bound of excess capacity of wholesalers. Our resulting excess capacity figures guide our assessment of wholesalers’ abilities to meet cash-transfer induced demand increases without incurring increased marginal costs.

We employ several analytical steps to estimate supply responsiveness and the resulting change in price. First, we estimate a short-run measure of trade capacity. For the top three commodities they sold, sampled wholesalers declared the maximum volumes that they could supply at any one time without increasing prices, given their current access to storage, transport, credit, etc. By applying self declared commodity specific sales prices to these volumes, we estimate the value of the maximum capacity a wholesaler could carry at any one time while keeping their access to trade-expanding inputs fixed (Column A, Table 8).

We then elicited, all else held constant, the number of days traders needed in order to fully restock and used this figure to generate the average maximum monthly frequency of restocking. In order to account for unforeseen delays and bottlenecks that may arise due to a simultaneous increase in the demand for transport, for supply from external sources, and for credit we divide in half restocking estimate, computing a lower bound estimate. For Dirib Gombo, which does not have a single wholesaler and whose wholesale market is therefore Marsabit town, we substitute the supply capacity for Marsabit town. As Column B in Table 8 shows, Marsabit town, the primary market centre in the district, can restock about five times a month while North Horr, the most remote town can only restock once a month.

To generate the total community value of wholesaler monthly capacity, we multiply the maximum estimated one-off capacity of a single wholesaler by the monthly restocking frequency and by the number of wholesalers in the community (Column E in Table 8). We then calculate the total value of average monthly sales in order to determine what the excess capacity is, and therefore, the ability of the market to absorb demand increases. We construct this variable by computing an average monthly value from the sum of quarterly sales solicited from the traders and dividing by twelve. We then multiply this monthly average by the number of wholesalers in the community (Column F, Table 8). The estimated value of excess capacity, in Column G, is simply the difference between monthly maximum capacity and current monthly sales.

Combining the key demand and supply results of Table 7 and Table 8 in Table 9, we can now compare the value of the excess capacity (estimated as the difference between wholesalers maximum monthly supply capacity and the current monthly average supply), with the value of increased demand generated by a cash transfer to the whole population. As Table 9 shows, in each sample community, our estimated induced demand response is less than the additional capacity that suppliers can provide over a month with little, if any, increase in costs. We estimate that North Horr, despite the fact that its wholesalers restock once or twice a month and it is most remote sub-location in the sample, can easily absorb induced demand, which is less than a quarter of excess capacity. At 49.2%, Logologo has the highest fraction of its surplus capacity being absorbed. This is not surprising because it is on the main road and less than an hour’s drive from Marsabit town, the local market hub. As such, wholesalers in Logologo do not need the capacity to carry large stocks as they can more easily replenish.

Dirib Gombo, whose retailers stock up from Marsabit town due to its proximity (less than 15kms away), naturally requires a trivial fraction of the town’s wholesale surplus capacity to meet its demand needs. And while Marsabit town acts as a central hub for many wholesalers and retailers in various towns in Marsabit, Marsabit town should be able to comfortably handle a demand response equal to 166 times Dirib Gombo’s. As Dirib Gombo has a marginal propensity to consume food and a food aid basket value that is greater than the average of other communities, Marsabit town should be able to meet a cash transfer induced demand response equivalent of that generated by over 190,000 households, more than the 160,000 households estimated to inhabit the entire Marsabit district. Barring a major conflict or substantial damage in transport and marketing infrastructure, the markets of Marsabit town and its satellite locations seem capable of catering to the level of demand increases likely to result from a substantial cash transfer program.

A related analysis further confirms this result. In, Figure 3 we present results of the following question, posed to traders: What would need to change for you to be willing to increase your capacity beyond your current maximum at current sales prices? That ‘increased demand’ is overwhelmingly ranked first indicates the capacity and willingness of traders to respond accordingly to transfer-induced demand. In addition, the previous analysis did not take into account re-stocking frequency. Incorporating the stocking rate only strengthens our result that the market supply would more than adequately absorb additional demand due to a cash transfer.

### Do local food traders behave competitively?

If traders behave competitively in crisis-affected communities, and no substantial barriers to entry exist, food prices should increase only as much as costs for traders. Determining the level of competitiveness in a certain market can require complex analysis if a high degree of precision is necessary. However, basic indicators can also inform an understanding of the level of competitiveness.

In Table 10 we compare the evolution of various market related variables between 2004 and 2009. The data are averaged from the two focus group discussions that were held in each community. The relatively large number of retailers in all locations suggests a highly competitive market at that node in the value chain. Ease of entry into the market, a key proxy for competitiveness, can improve market efficiency by encouraging competitive responses to increased demand. While the small number of participating wholesalers in our sampled communities could indicate potential for collusive behavior, the significant entry of new wholesalers over the past five years suggests that traders are not faced with insurmountable obstacles to entry and that market demand has been sufficiently robust to make entry a profitable proposition.

If firms collecting non-competitive rents in certain market segments can erect barriers to entry for likely competitors, traders can raise prices in the face of increased demand. To investigate this, each trader was asked his/her perspective on the ease (or difficulty) of entry into four market segments critical to commodity trade in their communities. Barriers to entry seem to become more substantial the ‘higher’ one is on the trader chain. Over 60% of respondents believe it is very easy to somewhat easy to enter retailing, whereas only 30% believe this is true of wholesaling and transporting (see Table 11). Some of the difficulty in entering wholesale and transportation could be attributed to start-up costs, which are considerable for both wholesaling and transporting. However, it is difficult to disentangle whether the respondent’s perception of ease (or difficulty) of entry is due to barriers erected by anti-competitive traders, due to high-start up costs or due to a combination. Nonetheless, the growth in both wholesaling and elements of the transport sector suggests that any non-cost barriers that exist are not substantial.

# Conclusion

Food aid has been the dominant response to food insecurity in Northern Kenya for many years. Our analyses indicate that cash is a feasible form of transfer for Marsabit district, a remote arid region in northern Kenya where much of the population suffers from food insecurity. We find that not only do residents have adequate access markets, but also that they have a demonstrated preference for at least some cash. For many food insecure households to prefer at least some cash is indicative of their confidence in markets’ abilities to deliver food. In our multinomial logit model, we further show that preferences for food are not driven by concerns about accessing the market or the availability of commodities in the market.

We also find that markets in Marsabit districts appear to have sufficient capacity to meet predicted increases in demand resulting from cash based responses to food insecurity. We find that under current market conditions, Marsabit traders could fully support a transition from current food aid based programs to a cash based program. We are also cautiously optimistic that Marsabit traders could meet increased needs during a short-term emergency, when a larger proportion of the population would be eligible for assistance. In the past five years, there has also been growing trader competition, particularly among the retail segment. We develop several scenarios to assess possible supplier responsiveness.

Our findings reflect the conditions under which the data were collected, during April – June 2009. Conflict was relatively infrequent and there were no major impediments to transportation of goods but the nation was reeling from a prolonged drought that resulted in a national food deficit and consequently to higher prices. Such factors influence the effectiveness of cash as a response. Consequently, active monitoring of prices, recipients’ market use, and market characteristics will be crucial for identifying rapidly deteriorating market access due to conflict, decreases in purchasing power due to abnormal inflation or anticompetitive behavior, or lack of availability due to external constraints, such as conflict.

Cash-based transfers can be supported by programming design. Local market changes, such as consolidation of businesses, or increased transactions costs due to rising fuel or credit prices can also erode the efficacy of cash, particularly when cash payments are not indexed to a bundle of goods. Indexing payments or securing cash reserves for inflation-related contingencies, will buffer recipients from any unanticipated price shocks. Advance notice by program agencies will allow traders to provision for expected increases in demand. Staggering cash transfers across communities could smooth demand increases.

While these analyses exclusively focus on Marsabit District, the fact that Marsabit is one of the poorest, most sparsely populated and infrastructure deficient Districts in Kenya would imply that markets in Marsabit should be relatively more underdeveloped than most other parts of the country. As such, the finding that markets in Marsabit are growing, underutilized, sufficiently stocked and can effectively respond to increases in demand suggests that in most cases this should be true of the other Kenyan districts. Cash responses to food insecurity would therefore be a promising, more cost-effective alternative to food aid across much of Kenya.

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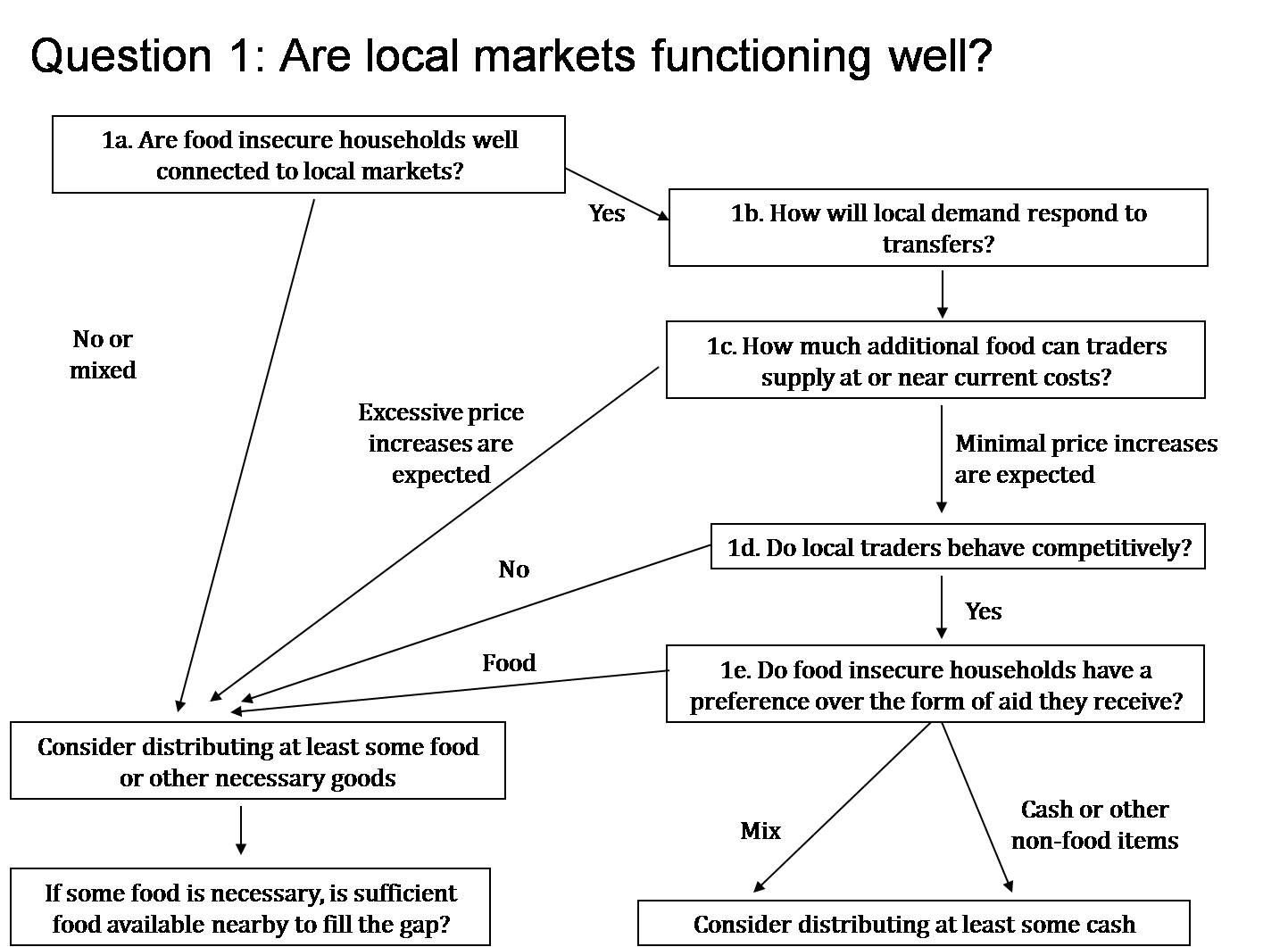
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**FIGURES**

Figure 1: The Food Aid/ Local Purchase/Cash Transfer Decision Tree

|  |
| --- |
|  |
| Source: Barrett and Maxwell (2005) |

Figure 2: MIFIRA Question 1: Are Local Markets Functioning Well?



(Source: Barrett et al. 2009)

Figure 3: Factor necessary for traders to increase their maximum stocking capacity at current sales prices

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**TABLES**

Table 1. Distribution of Trader Types Surveyed by Location

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Wholesalers** | **Retailers** | Itenerant**retailers** | **Total** |
| North Horr\* | 3 | 3 | 4 | 10 |
| Kargi | 1 | 2 | 3 | 6 |
| Dirib Gombo\*\* | 1 | 2 | 2 | 5 |
| Logologo | 1 | 2 | 2 | 5 |
| Loiyangalani | 2 | 2 | 3 | 7 |
| **Total** | **8** | **11** | **14** | **33** |

\* Given the size of North Horr location, and the spread of households in various sub-locations around North Horr town, we increased the survey size of traders to North Horr including several from Malabot, a sub-location of North Horr 30km from the town.

\*\* As Dirib Gombo does not have a wholesaler but uses Marsabit town, 15km away, as their wholesale depot, we survey a wholesaler from Marsabit town.

Table 2. Local market access and participation characteristics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Location** | **Number of different regular markets mentioned** | **Mean frequency of monthly visit to a market by season** | | | **Has the main commodity generally available over the last five years** |
|
| Rainy | Dry | |
| North Horr | 7 | 15 | | 17 | yes |
| Dirib Gombo | 6 | 6 | | 9 | yes |
| Kargi | 5 | 6 | | 13 | yes |
| Logologo | 5 | 13 | | 19 | out of stock once |
| Loiyangalani | 17 | 34 | | 36 | out of stock once |

Table 3. Dynamics of market access in Marsabit\*

|  |  |
| --- | --- |
| ***Compared to 2004, is it much easier, easier, the same, harder, or much harder to access transport to the major towns (Marsabit, Isiolo, Nairobi) today?*** | |
| Easier | 9 |
| Much easier | 1 |
| ***Compared to 2004, are food commodities in this market much more available, more available, the same, less available, or much less available today?*** | |
| Much less available | 1 |
| Less available | 1 |
| More available | 4 |
| Much more available | 4 |
| ***Compared to 2004, are non-food commodities in this market much more available, more available, the same, less available, or much less available today?*** | |
| More Available | 1 |
| Much more available | 9 |
| ***Compared to 2004, do members of these communities generally find it much easier, easier, the same, harder, or much harder to access markets?*** | |
| Easier | 3 |
| Much Easier | 7 |

\*Note that while the questions asked include several possible responses, we report only the responses given by the ten focus groups.

Table 4. Solutions to the factors limiting market access for household members

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Ranked factors preventing market access for household members** | **Solutions to the factors limiting market access for household members (frequency)** | | | | | |
| **Could not solve** | **Went to a different market** | **Sent a relative/ friend** | **Purchase by a neighbor or friend** | **Waited for situation to improve** | **Other** |
| **Illness** | 7 | 0 | 70 | 3 | 21 | 1 |
| **Age** | 5 | 1 | 46 | 2 | 0 | 0 |
| **Conflict** | 10 | 9 | 2 | 3 | 29 | 0 |
| **Gender** | 1 | 2 | 31 | 1 | 0 | 0 |
| **Bad weather** | 3 | 4 | 1 | 5 | 38 | 0 |

Table 5. Variable description and summary statistics

|  |  |  |
| --- | --- | --- |
| **Variable** | **Variable label** | **Summary Statistic** |
| **Stated Preference** | Dependent variable representing choice (Cash =1, Food=2, Mix=3) | - |
| **Dirib Gombo** | 1 if location is Dirib Gombo | 39\* |
| **Kargi** | 1 if location is Kargi | 41\* |
| **Logologo** | 1 if location is Logologo | 40\* |
| **Loiyangalani** | 1 if location is Loiyangalani | 42\* |
| **Gender** | Gender of respondent (0=Male, 1=Female) | 0.775^ |
| **Age** | Age of the respondent | 43.7^ |
| **Age Squared** | The square of the respondent’s age | 2124.9^ |
| **Livelihood Source** | The dominant economic role of the respondent (1=Does not engage with markets, 2=Has market engagement) | 1.09^ |
| **Food Aid Valuation Quintiles** | Household valuation of food aid receipts categorized into quintiles | - |
| **Household Size** | Household size in absolute numbers | 6.2^ |
| **Household Education** | Fraction of members above age 5 with positive education | 0.36^ |
| **Dependency Ratio** | Ratio of children(under 15) and elderly (over 65) over adult (15-65) household members | 1.33^ |
| **Number of Markets** | Number of markets mentioned by household as markets they could go to | 1.8^ |
| **Time to Market** | Total time it takes to get to the main market a household uses in minutes | 1516.4^ |
| **Use of Credit** | If household receives credit once a week or more (1=Once or more, 2=Never) | 0.57^ |
| **Credit Access** | How easy would it be for you to receive food on credit from the market (0=Very Difficult or Difficult, 1=Very Easy or Easy) | 0.23^ |
| **Shared Food Aid** | If shared or sold a portion of food aid (1= If shared, 0= Not shared) | 0.66^ |
| **Food Aid Receipts** | Maximum number of times received food aid from any one source in past year | 8.72^ |
| **Ratio of Food Purchased** | Fraction of food purchased from the market during drought stress | 0.17^ |
| **Food Expenditure Quintiles** | Household value of food expenditure categorized into quintiles | - |
| **MPCFfood** | Fraction of marginal hypothetical income (Ksh 2000) used to purchase food | 0.48^ |

\* Number of Observations

^ Means

Table 6. Multinomial logistic regression

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  | **Number of obs** | | **=** | **132** |
|  |  |  |  | **LR chi2(42)** | | **=** | **75.34** |
|  |  |  |  | **Prob > chi2** | | **=** | **0.0012** |
| **Log likelihood = -97.084936** |  |  |  | **Pseudo R2** | | **=** | **0.2796** |
|  |  |  |  |  |  |  |  |
| **Variable** | **Cash/Food** |  | **Z-score** |  | **Mix/Food** |  | **Z-score** |
| **Gender** | 0.39 |  | -0.96 |  | 0.51 |  | -0.73 |
| **Age** | 0.49 | \*\* | -2.09 |  | 0.48 | \*\* | -2.17 |
| **Age^2** | 1.01 | \*\* | 2.1 |  | 1.01 | \*\* | 2.17 |
| **Livelihood source** | 0.09 | \* | -1.77 |  | 0.22 |  | -1.28 |
| **Foodaid Valuation Quintiles** | 1.51 |  | 1.19 |  | 1.01 |  | 0.02 |
| **Household Size** | 0.74 |  | -1.64 |  | 0.93 |  | -0.44 |
| **Household Education** | 0.08 |  | -1.22 |  | 1.14 |  | 0.07 |
| **Dependency** | 1.38 |  | 0.95 |  | 1.05 |  | 0.16 |
| **Number of Markets** | 3.24 |  | 1.38 |  | 5.23 | \*\* | 2.18 |
| **Time to Markets** | 1.00 |  | -0.81 |  | 1.00 | \* | -1.87 |
| **Use of Credit** | 0.27 |  | -1.49 |  | 0.59 |  | -0.64 |
| **Credit Access** | 0.88 |  | -0.1 |  | 0.18 |  | -1.48 |
| **Shared Foodaid** | 0.92 |  | -0.09 |  | 2.12 |  | 0.9 |
| **Foodaid Receipts** | 1.00 |  | 0.03 |  | 1.03 |  | 0.18 |
| **Ration of Market Food** | 0.41 |  | -0.25 |  | 0.02 |  | -1.11 |
| **Food Expenditure Quintiles** | 1.98 | \*\* | 2.05 |  | 1.53 |  | 1.4 |
| **MPC food** | 2.82 |  | 0.45 |  | 36.48 | \* | 1.78 |
| **Dirib** | 2.58 |  | 0.59 |  | 0.44 |  | -0.6 |
| **Kargi** | 20.81 | \* | 1.78 |  | 1.24 |  | 0.15 |
| **Logologo** | 35.00 | \*\* | 2.03 |  | 0.77 |  | -0.18 |
| **Loiyangalani** | 49.89 | \*\* | 2.09 |  | 1.48 |  | 0.25 |

Table 7. Estimated value of food demand generated by cash transfer

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **HH population** | **Average value of food aid basket** | **Lower Bound MPC** | **Lower value of food demanded based on transfer to 40% of pop** | **Lower value of food demanded based transfer to entire pop** | **Upper Bound MPC** | **Upper value of food demanded based on transfer to 40% of pop** | **Upper value of food demanded based on transfer to entire pop** |
|  | A | B\* | C | D=AxBxCx0.4 | E=AxBxC | F | G=A\*B\*F\*0.4 | H=A\*B\*F |
| ***Dirib Gombo*** | 1170 | 1,797 | 0.53 | 445,728 | 1,113,863 | 0.75 | 630,747 | 1,576,868 |
| ***Kargi*** | 1831 | 1,349 | 0.49 | 484,124 | 1,210,204 | 0.75 | 741,006 | 1,852,514 |
| ***Logologo*** | 1131 | 2,263 | 0.47 | 481,177 | 1,203,198 | 0.75 | 767,836 | 1,919,590 |
| ***Loiyangalani*** | 1958 | 1,142 | 0.42 | 375,654 | 938,924 | 0.75 | 670,811 | 1,677,027 |
| ***North Horr*** | 2294 | 1,295 | 0.53 | 629,795 | 1,574,597 | 0.75 | 891,219 | 2,228,048 |

\* HH population is sub-location 99 Census scaled by 32%, which is the estimated Marsabit population growth rate from 1999 to 2009.

Table 8. Value of maximum possible wholesale supply capacity of Top 3 commodities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Value of max one-off capacity per wholesaler** | **Max monthly restock frequency/2** | **Value of max monthly capacity per wholesaler** | **No of wholesalers** | **Total value of wholesaler monthly capacity** | **Total value of current monthly wholesaler sales** | **Value of Excess capacity** |
|  | A | B\* | C=AxB | D | E=CxD | F\*\* | G=E-F |
| ***Marsabit Town***\*\*\* | 4,056,250 | 5.0 | 20,281,250 | 10 | 202,812,500 | 21,975,000 | 180,837,500 |
| ***Kargi*** | 637,000 | 4.0 | 2,548,000 | 4 | 10,192,000 | 588,500 | 9,603,500 |
| ***Logologo*** | 372,125 | 4.0 | 1,488,500 | 2 | 2,977,000 | 529,300 | 2,447,700 |
| ***Loiyangalani*** | 1,024,813 | 4.5 | 4,611,659 | 4 | 18,446,634 | 10,284,000 | 8,162,634 |
| ***North Horr*** | 1,193,601 | 1.0 | 1,193,601 | 8 | 9,548,808 | 3,001,500 | 6,547,308 |

\* Monthly restocking frequency derived by dividing number of days required to restock to full capacity by 30 days.

\*\* Sample wholesalers estimated average monthly sales for top 3 commodities

\*\*\* Marsabit Town is the closest wholesale destination to Dirib Gombo which is 15 minutes away by road.

Table 9. Induced demand as a fraction of excess capacity

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Value of Excess capacity** | **value of food demand generated by food basket value income transfer to entire pop** | **Cash-transfer generated demand as a fraction of excess capacity.** |
|  | A | B | A/B\*100 |
| ***Marsabit Town*** | 180,837,500 | 1,113,863 | 0.6% |
| ***Kargi*** | 9,603,500 | 1,210,204 | 12.6% |
| ***Logologo*** | 2,447,700 | 1,203,198 | 49.2% |
| ***Loiyangalani*** | 8,162,634 | 938,924 | 11.5% |
| ***North Horr*** | 6,547,308 | 1,574,597 | 24.0% |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 10. Evolving Market Characteristics | **Wholesalers** | | **Retailers** | | **Lorries owned** | | **Pick-ups owned** | | **No of days vehicle** | |
|  |  |  |  |  |  |  |  | leaves/arrives per week | |
|  | 2004 | 2009 | 2004 | 2009 | 2004 | 2009 | 2004 | 2009 | 2004 | 2009 |
| ***Dirib Gombo*** | 0 | 0 | 4 | 9 | 0 | 0 | 0 | 1 | 5 | 7 |
| ***Kargi*** | 1 | 4 | 12 | 19 | 0 | 0 | 3 | 11 | 1 | 1 |
| ***Logologo*** | 1 | 2 | 15 | 37 | 2 | 2 | 4 | 17 | 1 | 3 |
| ***Loiyangalani*** | 1 | 4 | 8 | 32 | 1 | 3 | 3 | 8 | 1 | 2 |
| ***North Horr*** | 3 | 8 | 40 | 70 | 3 | 5 | 9 | 11 | 1 | 3 |
| ***North Horr (malabot)*** | 0 | 0 | 2 | 7 | 0 | 0 | 1 | 1 | 1 | 1 |

Table 11. Trader perception of ease of entry into market segments.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ease of entry** | **Retailer without own shop** | | **Retailer with own shop** | | **Wholesaler** | | **Transporter** | |
| Freq | % | Freq | % | Freq | % | Freq | % |
| ***Very easy*** | 17 | 52% | 9 | 27% | 2 | 6% | 3 | 9% |
| ***Somewhat easy*** | 4 | 12% | 17 | 52% | 8 | 24% | 7 | 21% |
| ***Somewhat difficult*** | 4 | 12% | 6 | 18% | 12 | 36% | 6 | 18% |
| ***Very difficult*** | 8 | 24% | 1 | 3% | 11 | 33% | 17 | 52% |

1. The Ethiopian Productive Safety Net Program provided cash to some households and food aid baskets to others. It did not allocate a reserve of cash to offset inflation. When rapid inflation began to erode cash’s purchasing power, many households requested that they receive food rather than cash (Sabates-Wheeler and Devereux, 2010). [↑](#footnote-ref-1)
2. As Barrett et al., (2009) emphasize, while response analysis is typically assumed to follow needs assessment, it could in some cases precede it, providing a general default response analysis that can facilitate rapid decision making and would only require quick verification. [↑](#footnote-ref-2)
3. See Barrett et al., 2009 for more information on the MIFIRA framework. [↑](#footnote-ref-3)
4. Marsabit has now been split into three smaller districts [↑](#footnote-ref-4)
5. The household population is the 1999 Marsabit sub-location Census scaled by 32%, which is the estimated Marsabit population growth rate from 1999 to 2009. [↑](#footnote-ref-5)
6. For the omitted variables: Cash P>chi2=0.96, and Mix P>chi2=0.83, thus in both cases null cannot be rejected. [↑](#footnote-ref-6)
7. For the alternatives tested: Cash vs. Mix P>chi2=0.050, Cash vs. Food P>chi2=0.000, Mix vs. Food P>chi2=0.016, thus in all cases the null is rejected. [↑](#footnote-ref-7)
8. The household population is the 1999 Marsabit sub-location Census scaled by 32%, which is the estimated Marsabit population growth rate from 1999 to 2009. [↑](#footnote-ref-8)