

Credit program outcomes: coping capacity and nutritional status in the food insecure context of Ethiopia

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Abstract

This paper presents findings of a survey that was primarily intended as (1) an assessment of coping capacity in drought and food insecure conditions and (2) a microfinance program outcome study. A three group cross-sectional survey of 819 households was conducted in May 2003 in two predominantly rural sites in Ethiopia. Established clients of the WISDOM Microfinance Institution were compared with similar incoming clients and community controls.

No overall pattern of enhanced prevalence of coping mechanisms was observed in any participant group, suggesting that participation in the lending program did not affect coping capacity at the household level. No significant differences in mean mid-upper arm circumference or prevalence of acute malnutrition were found in males or females when the total sample was assessed. In the primary survey site, Sodo, female clients and their children had significantly better nutritional status than other comparison groups: the odds of malnourishment in female community controls compared to established female clients was 3.2 (95% CI: 1.1–9.8) and the odds of acute malnutrition in children 6–59 months of age were 1.6 times greater in children of both male clients and community controls (95% CI: .78–3.32). Household food security among female client households in Sodo was significantly better than in other comparison groups according to a variety of indicators. As compared to female clients, male clients and community controls, respectively, were 1.94 (95% CI: 1.05–3.66) and 2.08 (95% CI: 1.10–4.00) times more likely to have received food aid during the past year.

Findings of the present study suggest that microfinance programs may have an important impact on nutritional status and well-being of female clients and their families. That female clients were significantly less likely to be food aid recipients suggests that microfinance programs may be successful in reducing vulnerability to prolonged drought and food insecurity.

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Introduction

Ethiopia is one of the least developed countries in the world, ranking 168th out of 173 countries in the 2002 UNDP Human Development Index (United Nations Development Program (UNDP), 2002). The per capita

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GDP was US\$ 668 in 2000, and 31.2% and 76.4% of the population live on less than US\$ 1 and US\$ 2 per day, respectively (World Bank, 2002). Chronic food insecurity and poverty are endemic to Ethiopia. Conditions are worsening due to frequent droughts, and the population is progressively becoming more vulnerable and impoverished. An estimated 14.3 million people were affected by drought in 2002, and 11.3 million people faced severe food shortages with an additional 3 million at risk (Ethiopia Network on Food Security, 2002; EM-DAT: The OFA/CRED International Disaster Database, 2003). Food insecurity, exacerbated by drought, is rooted in dwindling income earning opportunities, the gradual erosion of the household asset base, and chronic poverty.

In recent years, USAID has provided an average of \$220 million in food aid annually as compared with only \$4 million in agricultural development aid (Thurow, 2003). While food aid has saved lives, it has contributed to a precarious situation of increasing destitution, vulnerability, and environmental degradation while the underlying causes of food insecurity have been left unaddressed. In the context of Ethiopia, where humanitarian aid is a frequent necessity in the prevention and mitigation of food shortages and famine, attention to development strategies is required if the increasing vulnerability and destitution of the population is to be reversed. Within this framework, sustainable development strategies that do not depend on the international donor community are essential if reconstruction and local development are to occur in a steady and uninterrupted manner. Stimulation of local economies is a requisite factor for restoration of individual livelihoods and reduction of vulnerability at both the household and community level. The role of microfinance institutions, which target poor and vulnerable population groups and work to stimulate local economies, is particularly relevant in Ethiopia and other similar contexts as it is a people-centered local development strategy that works to enhance protective mechanisms against disasters and other harmful events.

Microfinance can be defined as “provision of banking services such as savings, credit and money transfer to poorer people who cannot access ordinary mainstream banking services” (Wilson, 2003). While microfinance is typically viewed as an economic development strategy, it can also serve as a relief and survival strategy in disaster situations and in the transition from relief to development aid. Microfinance is a better long-term option than humanitarian assistance because it creates employment, expands economic opportunity, and stimulates local level development. Microfinance programs that facilitate reconstruction and sustainable development are important in the transition from an aid-economy to self-sufficiency.

As a consequence of disasters, households are likely to have fewer individuals that are formally employed or earning income and more dependants. Human capital loss results in changes in household morphology including higher dependency ratios and increased proportions of households that are headed by women and children. Disaster-affected households that have experienced changes in family structure and those that have been forced to sell assets are more vulnerable to risk. A study of failure of coping mechanisms and famine in Ethiopia found significant differences in coping abilities between poor households and relatively wealthier ones, where the impact of famine varied according to household income and asset base; relatively wealthy households coped better than poor households, and income distribution was also related to changes in food consumption (Webb, von Braun, & Yohannes, 1992). Murdoch summarized the relationship between poverty and disasters and concluded, “inflation, recession, drought, flood, illness and civil war hit hardest those households that are least well equipped to handle the shocks. Harder still... poverty is a source of vulnerability, and repeated exposure to downturns reinforces poverty” (Murdoch, 1999). Thus, there is a need to build endowment and financial and economic capacity into vulnerable populations to enable the most at-risk groups to withstand both chronic conditions and sudden shocks in both food and social security. At the household level, microfinance can serve as a vulnerability reduction strategy by promoting access to assets and increasing production.

During and after natural disasters, households frequently alter their behavior through coping mechanisms that aim to avoid liability and/or reduce risk. Coping capacity refers to the individual or household's ability to deal with risk, including resiliency. A multitude of factors contribute to coping capacity at both the individual and household levels. A conceptual framework of household and coping capacity and well-being is presented to illustrate the complex nature of coping and the potential interactions between determinants of coping capacity (Fig. 1). In the relief and reconstruction context, microfinance may serve to reduce vulnerability by providing access to capital, which protects clients against future risk and allows them to cope with economic losses resulting from disasters and prolonged insecurity (Sebstad & Cohen, 2000). In Mali, participation in lending programs increased household ability to deal with periods of crisis and economic difficulty, and clients were less likely than incoming clients to report periods of acute food insecurity (Dunford, 2001).

Microfinance is a particularly relevant approach in countries where disadvantaged groups tend not to benefit from involvement in the formal economy; in most developing nations, the majority subsists on income from microenterprise activities with the informal

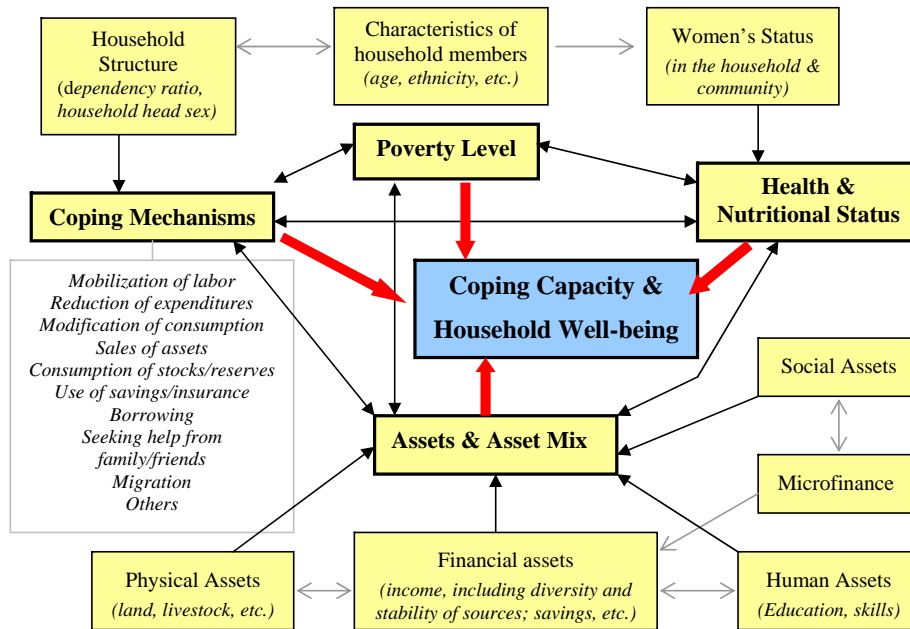


Fig. 1. Conceptual framework for coping capacity.

sector accounting for 20–70% of all employment (Wilson, 2001; Waters, Kombe, & Hong, 2001). From an ethical standpoint, poor populations are the most likely to be negatively affected by disasters, making such groups logical targets for vulnerability reduction strategies. From a development standpoint, where revival of informal and local economies is necessary for reconstruction and the restoration livelihoods, microfinance is logical approach because it functions at the grassroots level, can be sustainable, is capable of involving large segments of the population, and builds both human and productive capacity.

This paper present findings of a microfinance program outcome study in terms of coping mechanism use, household diet, and nutritional status.

WISDOM microfinance institution and survey sites

WISDOM is the World Vision microfinance counterpart in Ethiopia. The institution is headquartered in Addis Ababa and operates 15 branch offices throughout the country. In the 2003 fiscal year, WISDOM had US\$ 2,055,873 in disbursed loans and 12,157 active clients; 25% ($n = 2999$) of clients were women. The average outstanding loan size during the period was US\$ 141. The Adama and Sodo branches of WISDOM were selected to participate in the assessment because (1) they serve regions that are among the most drought-affected in Ethiopia and (2) the branches were relatively mature, having been operational for more than four years, which

allowed for the inclusion of clients that have been borrowing from the institution for longer periods of time.

The Adama branch of WISDOM is located in the East Shewa Zone of the Oromiya Regional State, approximately 100 km Southeast of Addis Abba. In May 2003, at the time of the assessment, the branch had 745 active clients. The branch serves the Districts of Adama and Boset, and the city of Nazareth. The Sodo branch is located in Wolayita, in the State of Southern Nations, Nationalities, and Peoples Region. The Sodo branch had 2517 clients when the survey was implemented; as a result of differences in branch size, three quarters of the sample ($n = 614$) was concentrated in the Sodo survey site. The remaining sample ($n = 205$) was drawn from the Adama branch.

WISDOM uses community banking and solidarity group lending methodologies to provide services to populations with limited collateral. Lending groups generally consist of 6–8 members; while initial collateral is not necessary, once receiving a loan, clients are in most cases required to open a savings account that cannot be accessed until loan repayment is complete (savings is not voluntary and functions as collateral). There are no specific requirements for composition of lending groups however, only one loan is permitted per household and the group as a whole is responsible for repayment. Clients in the Adama and Sodo branches reported using their loans for a variety of activities including: expansion of business (47%); purchase of oxen or other livestock (40%); purchase of fertilizer or

seed (31%); household use (21%); and leasing of land to farm (14%).

Methods

A survey of 819 households was conducted in May 2003 in two predominantly rural sites in Ethiopia. A severe drought affected both study areas in 2002/2003. The survey was primarily intended as an assessment of coping capacity in chronic drought conditions and microfinance program outcomes.

A three-comparison group cross-sectional design was used. Within the context of this study, multiple comparison groups were essential to address the problems of non-equivalence between borrower and non-borrower groups and selection bias. Use of a single comparison group is problematic in assessing microfinance programs because no ideal group of controls exists for established clients given their self-selection. Differences between microfinance clients and community members are not accounted for in the majority of evaluations, and are often erroneously attributed to program participation when in fact the two groups are dissimilar at baseline due to the self-selection of clients. Use of multiple comparison groups may help to reveal biases that would be encountered if only one comparison group was used.

This study compared two groups of clients that received loans (incoming clients who have completed one loan cycle or less and been participating in the program for no more than 10 months; and established clients who have completed two or more loan cycles) and one group of neighborhood controls that were eligible to participate in the WISDOM lending program, but had not received a loan within the past year and were not seeking a loan. The sample was stratified by survey site and client sex; participants were systematically selected from client lists of the microfinance institution. Community controls were frequency matched by sex and selected by proximity of residence to an established client participating in the study. Community controls were selected by a systematic random sample of the kabele (urban areas) or peasant association (rural areas) where established clients resided. In urban areas, community controls were selected from the same katenas as established clients included in the sample. Katenas are the smallest administrative unit and are composed of approximately 150 households. In rural areas, controls were sampled from the same village of residence as sampled clients. An adult individual of the indicated sex was selected from within the household as a respondent. If they were not available to be interviewed, the interviewer returned a second time; if after the second visit, the respondent

could not be interviewed, the nearest residence was selected as a replacement for the original control.

Nutrition status was assessed using mid-upper arm circumference (MUAC) as a measure of acute malnutrition. MUAC was selected as the anthropometric measure because it is commonly used for nutrition screening in emergency situations and because it is recommended for assessing acute adult malnutrition and prevalence of under nutrition at the population level (The Food and Nutrition Technical Assistance (FANTA) Project, 2003). Acute malnutrition is important in the context of food insecurity crises and is a predictor of mortality: the risk of death among acutely malnourished children is 2.8 times greater than for children who are not malnourished (Chen, 1980). Arm circumference measurements are considered as practical alternatives to BMI in field studies, and a robust linear correlation between MUAC and BMI has been observed in adults in multiple international settings (World Health Organization (WHO), 1995a). MUAC is an acceptable alternative measure of wasting in children, particularly in emergency situations, because it identifies children who are most at risk for morbidity and mortality (Semba & Bloem, 2001).

MUAC was collected on all survey respondents and the respondent's household members between 6 and 59 months of age. MUAC was measured on the left arm while hanging loosely down the side of the body. The measuring tape was fitted around the middle of the upper arm (half way between the shoulder and the elbow) and arm circumference was measured to the nearest millimeter (Medecins San Frontieres (MSF), 2002). Edema was diagnosed by applying moderate thumb pressure below the ankle for 3 s. A child was diagnosed with edema when an impression of the thumb remained, indicating fluid in the tissue had been displaced, and when edema was observed bilaterally (The Food and Nutrition Technical Assistance (FANTA) Project, 2003).

Malnutrition prevalence in adults was estimated based on WHO sex-specific MUAC cut off points of 22.0 cm for females and 23.0 cm for males with chronic energy deficiency (World Health Organization (WHO), 1995b). Children with MUAC below the 11.0 cm cutoff were considered severely malnourished, and those with MUAC less than 12.5 cm but greater than 11.0 cm were classified as moderately malnourished (Food Security Assessment Unit, 2002). Global acute malnutrition refers to children with MUAC < 12.5 cm or the presence of pedal edema (Ethiopia Network on Food Security, 2002).

Dietary quality and quantity were evaluated using 24 h recall of food aid intake. Specific indicators included frequency of meals consumed and dichotomous measures of consumption of protein rich foods. Diet-related coping mechanisms such as fasting, food

substitution, and changes in dietary quality and expenditures during the year preceding the survey were used as measures of food security. Current receipt of food aid and receipt of food aid during the year preceding the survey were also recorded.

Household coping capacity was evaluated based on self-reported use of fifteen coping mechanisms that are common in humanitarian emergencies and food insecure situations: additional work; migration to find work; longer than normal seasonal migration; above normal sale or consumption of large animals; above normal sale or consumption of small animals; changed composition of livestock to more drought tolerant animals; crop substitution; consumption of seed crop; spent savings; sale of household assets; sale of productive assets; rental/lease of home or land for income; pledge or sale of home or land; and discontinuation of children's schooling.

The survey used questionnaire-based interviews. The questionnaire was developed in English and was approved by WISDOM and World Vision. Piloting was done by WISDOM staff in Adama to assure the questionnaire was culturally and linguistically appropriate. Translation to Amharic was performed by a translation agency in Addis Abba that was selected by WISDOM; back translation was performed by WISDOM staff. Local interviewers were used to ensure knowledge of languages (Wolayita & Kembata) spoken in rural areas. All interviewers received two days of training that was conducted in Amharic, the national language. Data analysis was performed using SPSS Version 9.0 and STATA Version 7.0.

The study was approved by Johns Hopkins Bloomberg School of Public Health Committee on Human Research and by the local authority in Sodo, The Wolayita Zone Administration Office.

Results

No significant differences were found between established clients, incoming clients and community controls in terms of ethnicity, religion, years of formal education, literacy, or number of economically active individuals in the household. Mean educational attainment of household heads was 7 years, and 77% of respondents were literate. The average number of household members was 6 for all three comparison groups, and mean age for respondents in the three groups ranged from 33 to 35 years.

No significant association between length of participation in the lending program (in terms of months of participation and loan cycles completed) and traditional indicators of socioeconomic status such as monthly household income or change in asset value since enrollment were observed. Significant differences be-

tween incoming and established client groups on selected outcomes (including some nutrition indicators discussed below) do indicate that length of exposure to the microfinance program affects impact however, the nature of the relationship is unclear and difficult to quantify in meaningful terms.

Nutrition status

No significant differences in nutritional status were found between established clients, incoming clients, and community controls (Table 1). Average MUAC for males was 25.7, 26.0, and 25.8 cm for established clients, incoming clients, and community controls, respectively ($p = .418$ by ANOVA). No significant differences in mean MUAC were observed among males in the three comparison groups in Sodo or Adama ($p = .994$ and $.762$ by ANOVA, respectively). Female respondents in the established client, incoming client, and community control groups also had similar mean MUACs at 27.0, 27.1, and 26.5 cm, respectively ($p = .715$ by ANOVA). No significant differences in mean MUAC were found between the three comparison groups in either Sodo or Adama ($p = .260$ and $.891$ by ANOVA, respectively).

No significant differences in prevalence of acute malnutrition were found between adult males or females in the total sample population. Prevalence of acute male malnutrition using the WHO reference in established clients, incoming clients, and community controls, respectively, was 13.2%, 15.3%, and 10.3% ($p = .549$). No significant differences in prevalence of acute male malnutrition by participant group were found in Adama or Sodo ($p = .550$ and $.575$, respectively). Prevalence of female acute malnutrition using the WHO standard was 2.4% in established clients, 3.1% in incoming clients, and 6.7% in community controls ($p = .208$). In Adama, prevalence of malnutrition was similar among females in the three groups ($p = .642$). Significant differences in female malnutrition status by participant group were observed in Sodo ($p = .082$). Prevalence of malnutrition in Sodo was 1.6% in female established clients as compared to 8.3% in community controls ($p = .089$); the odds of malnourishment in female controls as compared to established female clients was 3.2 (95% CI: 1.1–9.8). No significant differences in malnutrition were observed between established and incoming female clients in Sodo ($p = .115$).

Wasting malnutrition status and presence/absence of edema was recorded in 608 of 706 children ages 6–59 months that were sampled. Mean MUAC for children 6–59 months of age was 14.3 cm. In the total sample, 5.8% of children were severely wasted and 10.2% of children were moderately wasted. The prevalence of edema was 1.8%, and 17.8% of children were classified as having global acute malnutrition. No significant overall difference in mean MUAC was found among

Table 1
MUAC and prevalence of acute malnutrition by participant group

	Established clients	Incoming clients	Community controls
<i>Male respondents (N = 456)</i>	<i>N = 240</i>	<i>N = 100</i>	<i>N = 116</i>
Mean MUAC in centimeters (SD)	25.72 (2.42)	25.97 (2.78)	25.77 (2.50)
Overall prevalence of acute malnutrition (%) MUAC <23.0 cm	32 (13.2)	15 (15.3)	12 (10.3)
<i>Female respondents (N = 352)</i>	<i>N = 164</i>	<i>N = 99</i>	<i>N = 89</i>
Mean MUAC in centimeters (SD)	27.01 (3.11)	27.09 (2.90)	26.53 (3.64)
Overall prevalence of acute malnutrition (%) MUAC <22.0 cm	4 (2.4)	3 (3.1)	6 (6.7) ^a
Sodo survey site	2 (1.6)	3 (3.7)	5 (8.3) ^b
Adama survey site	2 (5.0)	0 (.0)	1 (3.4)
<i>Children 6–59 months of age (N = 608)</i>	<i>N = 326</i>	<i>N = 120</i>	<i>N = 150</i>
Mean MUAC in centimeters (SD)	14.32 (1.91)	14.44 (2.29)	14.29 (1.87)
Prevalence of wasting (%)			
Severe (MUAC <11.0 cm)	18 (5.5)	12 (10.0) ^a	4 (2.7)
Moderate to severe (MUAC <12.5 cm)	46 (14.1)	21 (17.5)	27 (18.0)
Prevalence of acute malnutrition (%)	52 (16.0)	22 (18.3)	31 (20.7)

^aSignificant difference ($p < .10$) for comparison with established clients.

^bSignificant difference ($p < .05$) for comparison with established clients.

children of the three groups ($p = .808$ by ANOVA) however, differences existed within the survey sites. In Adama, mean MUAC of children in the three participant groups was significantly different with average MUACs of 14.8, 14.1, and 15.6 cm for children of established clients, incoming clients, and community controls, respectively ($p = .028$ by ANOVA). Mean MUAC among children of community controls was significantly greater when compared to children of established clients ($p = .071$); among children of incoming and established clients, mean MUACs were similar ($p = .120$). No significant differences in MUAC among children of established clients, incoming clients, and community controls was observed in Sodo ($p = .253$ by ANOVA).

Overall prevalence of severe wasting was significantly different among children of the three comparison groups however, prevalence of moderate to severe wasting (combined) and acute malnutrition were similar. Prevalence of severe wasting was 5.5% in children of established clients, 10.0% in children of incoming clients, and 2.7% in children of community controls ($p = .035$). When moderate or severe wasting was assessed, prevalence ranged from 14.1% to 18.0% in the three comparison groups and differences were insignificant ($p = .471$). Prevalence of edema was similar among the three groups at 2.8%, 1.0%, and 5.3% for children of established clients, incoming clients, and community controls, respectively ($p = .164$). Prevalence of global acute malnutrition ranged from 16.0% in children of established clients to 20.7% in children of community controls ($p = .443$).

While no significant differences in rates of malnutrition were found across groups, interesting differences

appeared among children of established female clients when compared to children of established male clients and community controls in the Sodo survey site. Similar differences were not observed in Adama; this is likely the result of inadequate power due to the smaller sample size and the lower prevalence of malnutrition. Mean mid-upper arm circumference was similar among children of female clients, male clients, and community controls in Sodo, with values ranging from 14.1 to 14.5 cm ($p = .797$ by ANOVA). Prevalence of severe wasting was greatest in children of male clients: 8.6% of children of male clients were severely wasted as compared to 3.6% of children of female clients and 3.1% of children of community controls ($p = .048$). In Sodo, prevalence of moderate or severe wasting in children of established female clients was 10.9% as compared 18.6% in children of established male clients ($p = .074$) and 18.0% in children of community controls ($p = .091$). The relative odds of moderate or severe wasting were 1.79 in both children of male clients and children of community controls as compared to children of female clients (95% CI: .89–3.96 for male client comparison; 95% CI: .87–3.79 for community control comparison). Prevalence of acute malnutrition followed a similar trend: 20.0% of children of male clients and 20.7% of children of community controls were malnourished as compared to 12.4% of children of female clients ($p = .133$). When compared to children of female clients, the odds of acute malnutrition were 1.6 times greater in children of both male clients and community controls (95% CI: .78–3.32).

Female client status remained a significant predictor of child nutritional status (presence of moderate to severe wasting) in multivariate regression models for

Sodo, suggesting that enhanced nutritional status among children of female clients is related to participation in the lending program.

Household diet and food security

No significant differences in the primary indicators of dietary quality and quantity were found between the three comparison groups when combined data from both sites was assessed (Table 2). The average number of meals consumed per day was 2.8 ($p = .126$ by ANOVA) and similar proportions of respondents in each group reported consuming two or fewer meals per day ($p = .281$). Protein consumption was similar with 70.9–74.5% of respondents in each group reporting consumption of protein rich food the previous day ($p = .708$).

Comparison of the total sample by client group revealed few significant differences in household diet and food security (Table 3). Established clients, incoming clients, and community controls were similar in terms of changes in dietary quality and household food expenditures: 42.4–52.2% of participants reported a decrease in dietary quality and 60.6–64.2% reported increases in food expenditures. Between 25.8% and 29.1% of participants reported increased dietary quality, and between 26.7 and 28.6% of participants reported no change in diet ($p = .517$). Approximately 16% of each participant group reported decreases in household food expenditures over the past year while 19.6–23.3% of households reported no change ($p = .861$).

In the Sodo survey site, changes in quality of household diet over the past year were significantly different among groups (no significant differences were observed in Adama). Findings indicate that female client households were more successful in maintaining quality diets than households of male clients or community controls. Changes in household food expenditures over the past year were similar with approximately 70% of respondents in each group reporting increased food expenditures ($p = .738$). While changes in expenditures were similar in the three comparison groups, only 41.9%

of female clients reported decreases in quality of diet as compared to 61.4% of male clients and 57.7% of community controls; 37.1% of female clients reported improved dietary quality in comparison to only 19.6% of male clients and 23.5% of community controls ($p = .005$, three way comparison).

Dietary quality as measured by protein consumption was similar among male and female clients and community controls when assessed by consumption of protein-rich foods; 72.0–79.0% of respondents in each group reported consuming protein rich foods on the previous day ($p = .403$). No significant differences in consumption of dairy products were observed, with 72.0–79.0% of each comparison group reporting having consumed dairy products the previous day ($p = .431$). Interestingly, female clients were significantly more likely to have consumed meat and eggs than members of either comparison group. 52.5% of female clients reported consuming eggs the previous day as compared to 30.6% of male clients and 36.7% community controls ($p = .000$ and $.010$, respectively). In terms of consumption of meat, poultry, or fish, 27.3% of female clients reported consuming one of these items the previous day as compared to 15.1% of male clients and 18.5% of community controls ($p = .009$ and $.087$, respectively).

No significant differences in food aid receipt were found when comparing both sites. Respectively, 19.6%, 16.8%, and 23.4% of clients, incoming clients, and community controls reported receiving food aid at some point during the past year ($p = .245$) and no significant differences were observed in average length of food aid receipt ($p = .127$ by ANOVA). 16.3% of clients reported currently receiving food aid as compared to 12.9% of incoming clients and 18.5% of community controls ($p = .300$). In Sodo, rates of food aid receipt among male clients and community controls were significantly greater than in female clients. 26.9% of male clients and 28.2% of community controls reported receiving food aid in the past year as compared to 16.5% of female clients ($p = .023$ and $.018$, respectively). As compared to female clients, male clients and community controls, respectively, were 1.94 (95% CI: 1.05–3.66) and 2.08

Table 2
Measures of dietary quantity and protein consumption by participant group

	Established clients (<i>N</i> = 406)	Incoming clients (<i>N</i> = 206)	Community controls (<i>N</i> = 205)
Mean number of meals per day (SD)	2.88 (.43)	2.88 (.40)	2.83 (.49)
Consumption of 2 or less meals per day (%)	57 (13.9)	28 (13.7)	38 (18.4)
Proportion consuming protein-rich foods (%)	296 (72.4)	152 (74.5)	146 (70.9)
Proportion consuming dairy product (%)	259 (63.6)	140 (69.7)	120 (59.1)
Proportion consuming eggs (%)	167 (41.5)	102 (50.7) ^a	84 (41.4)
Proportion consuming meat/poultry/fish (%)	94 (23.4)	54 (26.9)	43 (21.3)

^aSignificant difference ($p < .05$) as compared to established clients.

Table 3
Dietary quality, food expenditures, and food aid receipt by participant group

	Established clients (<i>N</i> = 406)	Incoming clients (<i>N</i> = 206)	Community controls (<i>N</i> = 205)
Change in quality of diet—past year			
Decreased (%)	186 (46.0)	86 (42.4)	102 (52.2)
Stayed the same (%)	108 (26.7)	58 (28.6)	162 (26.8)
Increased (%)	110 (27.2)	59 (29.1)	156 (25.8)
Change in food expenditures—past year			
Decreased (%)	67 (16.5)	33 (16.3)	33 (16.2)
Stayed the same (%)	79 (19.5)	47 (23.2)	40 (19.6)
Increased (%)	260 (64.0)	123 (60.6)	131 (64.2)
Receipt of food aid in the past year (%)	79 (19.6)	34 (16.8)	48 (23.4)
Months receiving food aid—past year (SD)	5.1 (4.1)	4.0 (2.4)	5.3 (4.0)
Currently receiving food aid (%)	65 (16.3)	26 (12.9)	38 (18.5)

Note: All comparisons were insignificant ($p > .10$) by chi-square tests or ANOVA.

(95% CI: 1.10–4.00) times more likely to have received food aid during the past year. Differences in current receipt of food aid and length of time receiving food were not significant between the three comparison groups ($p = .132$ and $.576$ by ANOVA, respectively).

Coping mechanism use

In general, coping mechanism use varied significantly between the sites however, prevalence of coping mechanisms among members of each participant group was similar in both Sodo and Adama (Table 4). Relatively few significant differences were observed between established clients, incoming clients, and community controls when using the total survey population. Established clients had the highest rate of sale and consumption of small animals at 36.0% as compared to 26.4% and 30.1% in incoming clients and community controls, respectively ($p = .018$ and $.146$). Prevalence of consumption of seed crop was similar among established clients and community controls at 17.1% and 19.2%, respectively ($p = .526$), while incoming clients had a significantly lower rate of seed crop consumption at 11.4% ($p = .067$).

In Adama, prevalence of coping mechanisms by participant group was similar for thirteen of the fifteen coping mechanisms studied. Significant differences ($p < .10$ level) in coping mechanism prevalence were observed when comparing established clients, incoming clients, and community controls for extended seasonal migration ($p = .053$) and households members working more or seeking additional jobs ($p = .091$). Two-group comparisons using established clients as the reference group rendered differences in seasonal migration insignificant. In the case of increased work, 19.8% of

established clients reported members of their households looked for additional work in comparison to 15.7% of incoming clients ($p = .541$) and 32.1% of community controls ($p = .087$). The high proportion of community controls looking for additional work as compared to the other two groups may be a product of lower demand for external labor in WISDOM clients, where clients generated additional income in microenterprises supported through the WISDOM lending program.

In Sodo, significant differences in coping mechanism use by client group were observed in two of the fifteen coping mechanisms that were assessed. There was a significant difference in the reported consumption and sale of small animals between the three client groups ($p = .094$). 37.7% of established clients as compared to 28.5% of incoming clients ($p = .005$) and 30.7% of community controls ($p = .137$) reported above normal consumption or sale of small animals. Significant differences in seed crop consumption were observed in Sodo where 14.7% of clients, 6.7% of incoming clients, and 17.3% of community controls reported consumption of seed intended for future plantings ($p = .015$). Two-group comparisons of seed consumption yielded no significant differences between established clients and community controls ($p = .478$) however, differences remained significant between established clients and incoming clients ($p = .013$).

Discussion

This study found that measures of nutrition status, diet, household food security, and coping mechanism use were relatively similar among established clients, incoming clients, and community controls when the

Table 4
Use of coping mechanisms in the past year by participant group

	Established clients (<i>N</i> = 403)	Incoming clients (<i>N</i> = 201)	Community controls (<i>N</i> = 203)
Sale/consumption of small animals (%)	145 (36.0)	53 (26.4) ^a	61 (30.1)
Household members worked more (%)	95 (23.6)	47 (23.4)	59 (29.1)
Borrowed from friends or relatives (%)	83 (20.6)	38 (18.9)	50 (24.6)
Sale/consumption of large animals (%)	74 (18.4)	32 (15.9)	36 (17.7)
Consumed seed crop (%)	69 (17.1)	23 (11.4) ^b	39 (19.2)
Spent savings (%)	56 (13.9)	29 (14.4)	23 (11.3)
Migration to find work (%)	45 (11.2)	17 (8.5)	28 (13.8)
Crop substitution (%)	43 (10.7)	24 (11.1)	18 (8.9)
Changed composition of livestock (%)	41 (10.2)	19 (9.5)	14 (6.9)
Discontinuation of children's schooling (%)	37 (9.2)	20 (10.0)	22 (10.8)
Sale of household assets (%)	35 (8.6)	14 (7.0)	16 (7.9)
Rented/leased home or land for income (%)	35 (8.6)	14 (7.0)	14 (6.9)
Longer than normal seasonal migration (%)	20 (5.0)	7 (3.5)	13 (6.4)
Pledged or sold house/land (%)	8 (2.1)	3 (1.5)	4 (2.0)
Sold productive assets (%)	6 (1.5)	3 (1.5)	5 (2.5)

^a*p* < .05 for comparison with established clients.

^b*p* < .10 for comparison with established clients.

sample population was assessed as a whole. In the primary survey site Sodo, which was the more drought-affected and food-insecure of the two sites, significant differences were observed in terms of respondent diet, household food security, and nutritional status. Established female clients and their households performed better on a variety of indicators when compared to other sub-groups, suggesting that microfinance programs may have a positive impact on household food security and physical well-being in selected households in the context of drought and food insecurity.

Nutrition status

In Sodo, female clients were significantly less likely to be malnourished than female community controls, and children of female clients were significantly less likely to be malnourished than the children of male clients or community controls. These findings may indicate that access to loans has differential effects (by gender of the loan recipient) on nutritional status. This finding corroborates evidence from Bangladesh where provision of credit to women had a statistically significant impact on child nutritional status while credit provided to men had no significant impact on the nutritional status of children. The authors of the study in Bangladesh concluded that credit programs have quantitatively important effects on children's health, particularly if the program participant is a woman, and that credit effects differ by gender of the recipient (Pitt, Khandker, Chowdury, & Millimet, 1998). Findings of the present study are also aligned with other microfinance impact

assessments. Participants in credit with education programs in Bolivia, Ghana, Burkina Faso, Bangladesh, and Mali have demonstrated positive health impacts including improvements in diarrhea treatment, breast feeding and complementary feeding, immunization, nutritional status, health knowledge, and household food security (Dunford, 2001; McNelly & Dunford, 1998; Pitt et al., 1998).

It is not difficult to conjecture on the causality of participation in lending programs and increased nutritional status considering that approximately 20% of respondents in the present study reported using loans to meet household needs. Theorized benefits of participation in lending programs include access to capital, increased income, and women's empowerment. These factors can positively benefit nutritional status via increased resource availability for household food supply, and in terms of food distribution within the household, resulting in better nutritional status for women and their children. Increased resources due to the receipt of loans and augmented income generation activities and the empowerment of women are factors that can result in enhanced nutritional status of female borrowers and their families. The gender difference of program impact suggests that (1) women as primary care takers of children may invest more of their income in family sustenance than men (Blumberg, 1995) and (2) in comparison to men, women may be more likely to be disadvantaged (both economically and in terms of resource control) and thus have more to gain from participation in lending programs.

In Sodo, the most drought-affected and food insecure of the two survey sites, established female clients had the lowest prevalence of wasting suggesting that microfinance programs may help to improve coping capacity and physical well-being among selected clients in the context of prolonged drought and food insecurity.

Household diet and food aid receipt

Differences in household food security and diet were minimal when comparing the three participant groups in both sites. In Sodo, female client households had better nutritional status than male client and community control households, thus it is reasonable to conjecture that differences in diet and household food security may be contributing factors to enhanced nutritional status. In Sodo, consumption of meat and eggs were significantly greater in households of female clients, suggesting better dietary quality, and offering a possible explanation for improved nutritional status. Significant differences in indicators of both dietary quality and quantity suggest that diet and food security in female client households in Sodo was superior when compared to households of male clients and community controls. These outcomes concur with the hypothesis that participation in lending programs results in and enhanced well-being for female borrowers and their families.

Data on receipt of food aid supports these findings where, in Sodo, female clients were significantly less likely than male clients or community controls to have received food aid in the past year. The median length of participation of established clients in Sodo was 30 months, thus a temporal relationship between receipt of loans and receipt of food aid can be established. Rates of food aid receipt in male clients and community controls were similar and significantly greater than in female clients. This suggests a differential impact of the microfinance program by client sex, where female client households benefit to greater extent than male client households. Data on household diet and food aid receipt reflects a trend that is similar to nutritional status findings, where benefits of participation in the lending program appear to differ by client gender.

That female clients are significantly less likely to be food aid recipients suggests that microfinance programs are successful in reducing vulnerability to prolonged drought and food insecurity. If this finding is accurate and participation in lending programs actually reduces dependency on food aid, these results are significant because they illustrate that investments in long-term sustainable development strategies such as microfinance programs can be successful in enhancing population well-being and in decreasing the need for humanitarian aid which is both costly and unsustainable. While the role of microfinance programs in natural disasters and

complex emergency settings is recently being explored, results of this study suggest that lending programs may be a successful means of promoting increased food security and physical well-being in the context of disasters and food insecurity crises, particularly when loan recipients are females.

Coping mechanism use

Prevalence of coping mechanisms at the population level can be used to assess the severity of disaster situations. Coping mechanism use varies by population, and in the case of Ethiopia the rural population uses coping mechanisms on annual basis during the lean season, or immediately before harvest (3–5 months per year). These ‘ordinary’ coping mechanisms include alteration of diet, small animal sales, and borrowing from friends or neighbors. Of particular interest in the context of disasters and extreme food insecurity are ‘extra-ordinary’ coping mechanisms, or those which are not used in average years and indicate a departure from long-term sustainability to subsistence on a day to day basis. Extra-ordinary coping mechanisms reported during drought and famine periods are more drastic and less reversible, and include things such as livestock and asset sales and migration. Findings in this study support data from other studies that suggest a gradual erosion of household asset base and coping capacity in the Ethiopian population (FEWS Ethiopia, 2003). Prolonged exposure to drought and food insecurity has created a situation where large segments of the population are no longer able to successfully resist climatic and market-related shocks.

In general, coping mechanism use varied significantly by site however, the prevalence of coping mechanism use among members of each participant group was similar in both Sodo and Adama. While some differences in prevalence of coping mechanisms were statistically significant between the three comparison groups, no overall pattern of enhanced coping capacity was observed in any participant group, suggesting that participation in the lending program did not affect the use of coping mechanisms at the household level. One potential explanation for these findings relates to the choice of variables used to measure coping capacity. The majority of indicators selected are ex post coping mechanisms that are used in response to shocks. Ex ante protective mechanisms, or those used to help households protect against risk, such as asset accumulation and income diversification, were not included as coping mechanisms. In the present study, established client households had significantly more diverse incomes (both in terms of total household income sources and per capita income sources) than either incoming clients or community controls, suggesting that participation in the WISDOM lending program may have resulted in

increased ex ante protective mechanisms. While similarities in prevalence of ex post coping mechanisms indicate that participation in the WISDOM lending program may not have increased household ability to respond to shocks, significantly greater diversification of income among client households suggests that access to loans may help microfinance clients to protect against risk via increased use of ex ante protective mechanisms.

Study limitations

The inability to randomly assign participants to experimental and control groups is a problem common to all microfinance evaluations, and thus cannot be viewed as a primary limitation of the study since nearly all microfinance research is based on quasi-experimental designs.

The principal limitation of this study is the cross sectional design. An important drawback of a cross sectional is inability to control for secular trends or directional changes in characteristics of the population over long periods of time. Because WISDOM clients enrolled in the organization over an extended period of time and no baseline data is available, it is difficult to establish if clients enrolling during different periods are similar and consequently, the comparability of incoming and established client groups is drawn into question. Study findings suggest that changes in enrollment practices resulted in secular trends in program participants, where incoming clients had better socioeconomic status than established clients. The study attempted to control for secular trends by using multiple comparison groups, time-bound indicators, and by establishing significant differences in individual and household characteristics between participant groups. Another study limitation is the relatively small sample size in Adama which limited the ability to detect differences between (1) the three comparison groups at the site and (2) the different locations.

Conclusions

In the context of Ethiopia, where recurrent drought and chronic food insecurity have left much of the population destitute and vulnerable to minor shocks, local development strategies that are sustainable, and ultimately independent of international development assistance, are a particularly important component of efforts to restore livelihoods. Such people-centered development strategies that function to build capacity and provide opportunity at community level are not a panacea for future drought and food security threats, however, they are an opportunity to increase population coping capacity and resistance, and ultimately, to minimize the negative impacts of these inevitable events.

Findings of the present study suggest that microfinance programs may have an important impact on the nutritional status and well-being of female clients and their families, especially in the context of drought and food insecurity. These results, where female clients and their children demonstrated increased nutritional status, provide additional evidence to support the hypothesis that provision of credit to women may enhance household well-being. While findings of the present study are encouraging, additional research employing stronger designs with cohorts of microfinance participants in multiple locations could provide more conclusive evidence on the impact of microfinance programs on the nutritional status of clients and their households.

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