

FREEDOM FROM HUNGER
Three-Year Impact Evaluation of *Credit with Education* in Ghana
Summary of Results

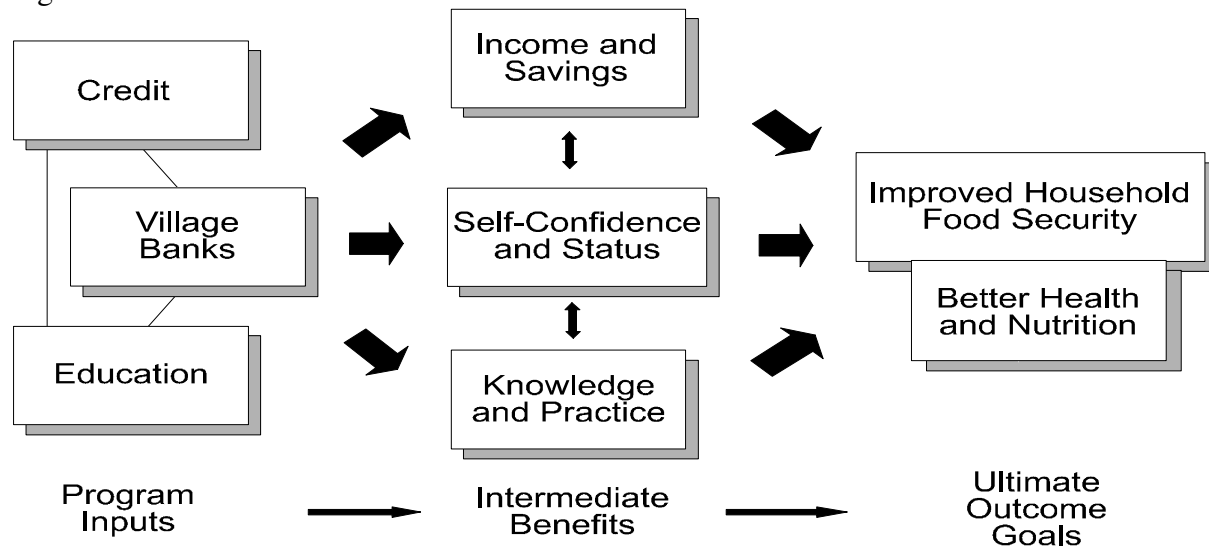
Presented by Barbara MKNelly at the *Credit with Education* Learning Exchange, August 4-6,
1997

Introduction

Freedom from Hunger, in collaboration with the Program in International Nutrition at the University of California, Davis, undertook a three-year impact evaluation of *Credit with Education* as implemented by the Lower Pra Rural Bank in coastal Ghana. Funded primarily by the Thrasher Research Fund and UNICEF/New York, this impact research employed a more extensive and rigorous research protocol than is common for program evaluations. In addition to the survey and anthropometric measures (heights and weights) used to evaluate program impact, Freedom from Hunger also contracted the Nutrition Unit of the Noguchi Memorial Institute of Medical Research in Ghana to carry out a dietary intake study of a sub-group of children included in the survey. Summarized here are excerpts of findings that address each of the evaluation research study questions.

The conceptual framework guiding this impact evaluation is depicted in the hypothesized benefit process diagrammed in Figure 1. The strategy's ultimate goals—improved household food security and nutritional status—require first that the intermediate benefits of poverty alleviation, empowerment, and behavior change be achieved. For this reason, qualitative and quantitative methods were used in addition to measures of nutritional status (maternal and child heights and weights) to investigate impact on the program's intermediate goals—women's economic resources, their health/nutrition knowledge and practice, and women's empowerment as measured by their self-confidence and status.

Figure 1. *Credit with Education* Benefit Process



The evaluation research tested four hypotheses:

1. *Credit with Education* in a community has a positive effect on the nutritional status of children.
2. Program participation will increase women's economic capacity (income, savings, time) to adopt beneficial behaviors and to invest in nutritionally important expenditures such as food and health care.
3. Program participation will increase women's knowledge, trial, and adoption of beneficial breastfeeding, weaning, and diarrhea management and prevention practices.
4. Program participation will increase women's status and self-confidence to plan and offer a healthy diet to their families, especially to their young children.

Methods

The evaluation employed two major data collection rounds—a 1993 baseline and a 1996 follow-up—with different mother/child pairs participating in the two time periods. Only mothers having young children were included in this research as this is the most nutritionally sensitive and frequently malnourished age-group. However, this made it infeasible to include the same women in the two time periods since few women had children of the desired age in both years.

A 1993 baseline survey was conducted in 19 communities in the Lower Pra Rural Bank catchment area. Study communities were identified by the Lower Pra Rural Bank as being appropriate and interested in the program but which had not yet been offered *Credit with Education*. Interviews were conducted with 370 women. These women were randomly selected from comprehensive lists prepared in each community of all the women having a one-year-old child. The baseline survey collected information on household socioeconomic status, food security, food expenditures, women's income-earning activities (profits, costs, time spent, assets), intrahousehold spending decisions, and women's health/nutrition knowledge and practice. In addition, height and weight of mothers and their children were measured to determine nutritional status.

Following baseline data collection, the 19 study communities were stratified into four groups on the basis of their size and access to a main road. For each stratification, the study communities were assigned to a program or control group. The majority of study communities, 13 of 19, were assigned randomly. In three cases, the Rural Bank felt obligated to offer the program to a particular study community. For these cases, matched controls were selected on the basis of their similarity to program communities in terms of proximity, commercial development, size, and access to main roads. Communities in the program sample were offered the program as soon as possible after the baseline research, while those in the control sample were not offered the program until after the completion of the research.¹

¹ A program representative visited each potential study community to explain the purpose of the program and the research. Voluntary participation in the study was sought at that time from local leaders. In each

In Year Two of the research, qualitative methods were used to (1) identify site-specific manifestations of women's empowerment and self-confidence, (2) more openly explore aspects of program impact, and (3) assess the adequacy of delivery of the credit and education services, in particular the quality of the learning sessions designed to motivate behavior change. Informal discussion groups, observations of program meetings, and in-depth individual interviews with field agents, participants, and nonparticipants were undertaken.

In 1996 follow-up research was conducted in the same communities, although with different mother/child pairs. For this research, it was necessary to expand the age range to include children under three years of age because fewer than predicted program participants had one-year-old children in 1996. Virtually the same survey was used, with the addition of questions to measure empowerment and a few other aspects of program impact that emerged as important from the qualitative interviews. Three types of women were included in the follow-up: participants, nonparticipants in program communities, and residents of control communities. All participants in study communities who had completed at least three four-month loan cycles and had a child under three years of age were included. Nonparticipants and residents of control communities were randomly sampled from comprehensive lists of all the women with children under three years of age.

Analysis

Program impact is evaluated by comparing the difference between the two years for participants, nonparticipants, and residents in control communities. None of the 1993 respondents were participants when the baseline was carried out. For the analysis, baseline respondents in program communities have been reclassified on the basis of whether they ever joined the program when it was ultimately offered in their community. Consequently, baseline respondents in study communities who received the program are classified either as "future participants" or "future nonparticipants." This distinction is very helpful for dealing with the possibility of self-selection bias that confounds many credit program impact evaluations.²

By comparing the measures of future participants to 1996 participants, the difference between years can better be attributed to the impact of the program and not to inherent differences between respondent groups. Statistical significance was tested by comparing the difference in the various outcome measures between the years and whether there was a statistically significant interaction for year and participant status. SPSS software was used for the data analysis.

instance, it was made clear that the community might be selected to a control group that would not be offered the program for two years time.

² Self-selection bias refers to the possibility that differences found in the impact areas of concern might reflect systematic differences between the type of women that join the program and those that do not, rather than the impact of the program. For example, if participants are found to have better nutritional status than nonparticipants, it is possible that this is not a result of their program participation but a reflection of the fact that women who are better nourished tend to join the program.

Impact on the Ultimate Goals—*Nutritional Status and Food Security*

In 1993 the nutritional status of children from the control communities was actually significantly better than the program communities. Only 15% of one-year-olds in the control community had height-for-age z-scores (HAZ) indicating moderate to severe malnutrition, as compared to 25% of the children in program communities.³ However, after the program was implemented, the nutritional status of participants' children showed significant and positive differences from baseline measures as compared to the children in the control communities.

Figure 2 shows that the mean HAZ was 0.3 greater for one-year-olds of 1996 participants compared to the mean HAZ of the future participants measured in 1993.⁴ The mean HAZ for one-year-olds dropped by 0.2 in control communities between the 1993 and 1996 periods. When controlling for children's age and maternal height, there was a significant interaction between year and participant status when comparing participants and controls. The same significant and positive interaction effect was found when conducting similar analysis of the one-year-olds' mean weight-for-age z-scores. **This indicates that for the two time periods, *Credit with Education* had a positive and significant impact on the nutritional status of participants' one-year-old children.**

Figure 3 summarizes similar analysis which compares the difference in maternal nutritional status for the baseline and follow-up periods.⁵ Maternal nutrition is measured by the mother's body mass index (BMI), which is derived from a calculation comparing a woman's weight for her height. A BMI below 18.5 indicates moderate thinness and possible malnutrition. The mean BMI for the participant and control groups was slightly higher between the two time periods, while the mean BMI for the nonparticipant group was slightly lower. **The interaction between year and participant status was not significant when comparing the participant and control samples, indicating no positive program impact on maternal nutrition.** Three factors are likely to explain this lack of positive impact: (1) maternal malnutrition, or moderate to greater thinness, was not prevalent in the program area—only 13% of the mothers measured for the baseline had BMI below the cut-off; (2) the program's education component does not emphasize maternal nutrition, with the exception of diet during pregnancy and when lactating; and (3) the program's credit component and subsequent expansion of loan-financed activities has an indeterminate net effect on women's workload and caloric expenditure.

Figures 4 and 5 demonstrate that the program has had a positive and significant impact on household food security. For the participant sample, the percentage of families who had experienced a period when they had to eat less or less well during the preceding 12 months was almost cut in half. However, virtually no change was evident for the nonparticipants in program communities or for the residents in control communities. The interaction between year and participant status was significant in comparisons of participants versus controls and participants versus nonparticipants. As fewer participant households experienced a hungry season, the mean duration of this period was also growing shorter for participants—less than one month in 1996,

³ Z-scores represent the standard deviation from the NCHS median for children of that age and sex. For example, a z-score of 0 would indicate a weight-for-age measurement that was the same as the NCHS median, while z-score values of 1 or -1 represent one standard deviation above or below the NCHS median. Children with z-score measures between -2 and -3 are categorized as moderately malnourished and below -3 as severely malnourished.

⁴ As it would not be appropriate to compare the scores of dissimilar age-groups, only the one-year-old children measured in 1996 were included in this analysis.

⁵ Pregnant women were excluded from this analysis.

compared to a mean of almost two months for residents in control communities. **Again, the significant interaction indicated a positive and significant impact of the program in shortening the duration of the hungry season.**

Impact on the Intermediate Goals—Women's Incomes

Over 90% of the 1996 participants reported their incomes had increased or increased greatly since joining the *Credit with Education* program. Participants identified the following reasons their incomes had increased: expanded scale of income-generating activity (53%), costs reduced because no longer dependent upon getting inputs on credit basis (36%), costs reduced because now able to get inputs in bulk (30%), undertook new activity or new products (28%), and sold to new customers (8%).

Many women had engaged in their loan activity before they joined the *Credit with Education* program. However, they commonly spoke of the improved profit margin they were able to earn after borrowing from the program. Before joining, women often got all or part of the inputs they needed on credit because they lacked working capital. Information from the baseline survey indicated that the effective interest rate in this type of arrangement was on average 17% for a two-week period, or approximately 442% per annum. In some instances, women were able to acquire inputs on credit at the same price as if cash had been paid up front. However, women explained that even when the cost was the same, getting inputs on credit took more time (to locate a willing supplier) and resulted in less secure income-generating activities.

Women's income was quantified by focusing on non-farm earnings in the four weeks preceding the survey. Because few women kept records of their income-generating costs or earnings, the recall period was relatively short. Women were asked to estimate profits, itemize their business costs (not including family labor, depreciation, or interest payments), and estimate revenue earned for the time period that best captured the product cycle—per day, per week, per two weeks, or per month. The estimate of net income is not meant to reflect women's total income; major types of income such as farm sales were excluded. Rather, the focus of the data collection was on the type of income—notably microenterprise earnings—that the program was likely to affect. Figure 6 indicates there was a significant difference between years for participants versus the control sample but not for nonparticipants versus controls.⁶ As compared to baseline measures, the increase in net non-farm monthly income was \$36 for participants, \$18 for nonparticipants, and \$17 for controls.

⁶ Mean amounts are presented in 1996 dollars, controlling for United States inflation between the two time periods.

Figure 6: Net Income from Microenterprise or Wage Income in the Four Weeks Preceding the Survey

Year	Program Communities		Control Communities
1993	Future Participants N=44 \$5.75 (8.2)	Future Nonparticipants N=145 \$4.05 (8.9)	Residents N=94 \$5.98 (11.1)
1996	Participants N=86 \$41.50 (46.8)	Nonparticipants N=103 \$21.95 (43.5)	Residents N=99 \$22.85 (52.9)

The range in participants' monthly earnings was considerable. Some participants had net monthly non-farm income as high as \$200 to \$330 per month, while 10% of the participants reported net earnings of \$10 or less per month. As with other impact evaluations, it is clear there is a real diversity of impact even within the same Credit Associations, with some women enjoying considerable improvement in their activities while others experiencing little change. Overall, the 1996 participants exhibited significant improvement in their non-farm earnings. Still, persistent economic vulnerability of participants was evident in that 24% reported they had faced some repayment problems during the previous loan cycle, often due to their own or other family member's illness.

Women's Health/Nutrition Knowledge and Practice

An assumption underlying the design of the *Credit with Education* strategy is that while poverty is the root cause of malnutrition, income increases alone are unlikely to positively influence children's nutritional status. Also important are key health and nutrition practices that will best nourish children, keep them healthy, and promote their good growth. For this reason, learning sessions are facilitated at the Credit Associations' regular meetings to promote a variety of ideal behaviors related to breastfeeding, child feeding, diarrhea treatment and prevention, immunizations, and family planning.

While the evaluation collected information on knowledge and practice in each of the health/nutrition topic areas, for the purposes of this brief summary only the breastfeeding results are reported here. The ideal breastfeeding behaviors promoted by the program include: (1) giving the child the first antibody-rich milk, colostrum, rather than discarding it; (2) exclusively breastfeeding babies until they are approximately six months of age; and (3) not using feeding bottles. Figures 7-10 plot the baseline and follow-up measures of these breastfeeding practices.

For the three baseline groups, between 35-40% of the mothers interviewed reported they had discarded their colostrum either before or after their one-year-old child was born. Informal discussion groups did not reveal any strong cultural taboo against giving infants colostrum. Some mothers simply believed its thick, yellowish appearance meant colostrum was unhygienic and not good for the baby. Through skits and group discussions, field agents facilitated learning sessions that emphasized the benefits of colostrum for keeping newborns healthy. Figure 7

shows that while only 60% of the 1993 future participants had given their newborns colostrum, 98% of the 1996 participants who gave birth after joining the program had done so. **There were significant and positive differences between years for participants versus controls and for participants versus nonparticipants, indicating a positive effect of the program on encouraging mothers to give newborns colostrum.**

An ideal behavior that received considerable attention by the program was exclusive breastfeeding (meaning no water or foods) until newborns are approximately six months of age. The baseline research found that a great majority of mothers (93%) introduced water during their newborn's first week of life. Virtually all mothers believed newborns needed water to survive. However, even in hot, dry climates, breastmilk contains sufficient water for a young baby's needs. Giving them water greatly increases their risk of getting diarrhea and other illnesses. In terms of "first foods," 90% of the baseline respondents had introduced watery foods (like koko, a maize-based porridge, or mashed kenkey, a maize-based polenta) by the end of the baby's fourth month (120 days).

Through role-plays and group discussions, field agents emphasized that breastmilk alone is the safest and best food for babies and provides all the necessary nutrition and hydration a baby requires from birth through about six months. During the period of the research, this same message was increasingly being promoted by local health centers due to training provided by UNICEF to health care providers. Reinforcement from multiple, trusted sources was probably instrumental in convincing participants to try this revolutionary behavior. Several of the Credit Associations made a positive example of these early innovators by awarding them certificates and keeping snapshots of participants' "plumpy" babies that had been exclusively breastfed for about six months.

Graphs 8-9 demonstrate the remarkable change in exclusive breastfeeding practices in general, but most dramatically for *Credit with Education* participants. There were significant differences in the mean age when water and watery foods were first introduced to newborns between years for both participants versus residents of control communities and for participants versus nonparticipants. **These graphs indicate the positive and significant impact the program had on exclusive breastfeeding from women giving birth after joining the *Credit with Education* program.**

On average, participants did not introduce water or watery foods until their babies were in their fifth month of life.

Graph 10 also indicates area-wide improvements. Fewer women in each group reported ever using a bottle to feed their under-three-year-old babies. However, the decline in bottle use (from 88% to 11%) was most dramatic for 1996 participants who had given birth after joining the program. **A positive and significant impact of the program was evident in reduced use of feeding bottles by participants versus controls and participants versus nonparticipants.**

An overall breastfeeding behavior score was derived on the basis of each of the four ideal behaviors (counting delayed introduction of water and watery foods separately). Respondents received a maximum score of four—one point each for giving colostrum to newborns, not giving water until a newborn was at least 120 days, not giving watery foods until at least 120 days, and never using a feeding bottle. In all three groups, breastfeeding practices in general improved, although least of all for residents of the control communities. However, the greatest difference was evident for the participant group which had a baseline mean breastfeeding score of 0.8 and a

follow-up mean score of 3.2. Nonparticipants went from a mean score of 0.92 to 1.9, and residents in control communities went from 0.96 to 1.6. **The difference between years for the overall breastfeeding score was statistically positive and significant for the participants relative to the other two groups.**

Women's Empowerment

Over two dozen individual variables were used to measure women's empowerment. These variables were meant to capture impact on three manifestations of empowerment: (1) women's self-confidence and vision of the future, (2) women's status and decision making in the household, and (3) women's status and social networks in the community.

For this brief summary, only the results pertaining to women's status and social networks are presented. The type of information collected to assess impact on this manifestation of empowerment pertain to women's social interactions. Women were asked in both the baseline and follow-up interviews whether in the last six months they had been a member of a group or association, whether they had helped a friend with his/her work, and whether they had advised a friend or family member about good health/nutrition practices or good income-generating activities. Figures 11-14 present the findings for the three groups for both years. In all cases, there were significant differences between the years for participants versus the controls and for participants versus nonparticipants. Not surprisingly, *Credit with Education* participants were significantly more likely to be a member of a group. It seems this membership also resulted in their making more "helping" contacts with friends and family. **Program participation had a positive and significant impact on whether women offered health/nutrition advice to others. Participants were also more likely to have helped a friend with his/her work or offered advice about income-generating activities.** These types of helping contacts and strengthened social networks can enable the program to have a positive community-wide impact beyond the direct participants alone.

Two additional measures of social status and networks were identified through qualitative research and added to the 1996 follow-up survey. Women explained that an important impact of the program was that it enabled them to participate in and contribute more to funerals. For many ethnic groups in Ghana, including the Fante, considerable social obligation and financial expense are associated with death and funerals. Funeral parties are typically held long after someone is buried, since it takes the family as much as a year or more to accumulate the money to host an appropriate funeral party. Food and drink are served, and chairs and a sound system might be rented. Attending and contributing to the cost of non-kin funerals is important to an individual's social status and to the status and reputation of an individual's family. One participant explained that if you do not attend or contribute to other families' funerals, the head of your own extended family may say you are disgracing your family and jeopardizing the help your family will receive when there is a death. For 1996 respondents, the mean amount of money contributed to non-kin funerals in the last month was significantly higher for participants as compared to nonparticipants or residents in control communities. There were not, however, significant differences among the three groups for the mean number of funerals attended.

An overall score was developed for women's status and social networks in the community. A respondent could receive a maximum score of six—one point for each of the following: (1) membership in a group or association; (2) helping a friend with his/her work in the last six months; (3) offering health/nutrition advice in the last six months; (4) offering income-generating

advice in the last six months; (5) attending more than three funerals in the last month; and (6) contributing more than \$1.66 to non-kin funerals in the last month. For interval variables like the last two, a cutoff point was selected based on the percentage distributions at approximately the 75th percentile. A similar approach was also used by the John Snow Inc. Empowerment of Women Program in its construction of empowerment scales. The rationale for the cutoff is that women in the top 25% of the range of funeral attendance and contributions stand out as being more “empowered” relative to the other women for these measures. In 1996, participants’ mean score was significantly higher than either nonparticipants or residents in control communities. With a maximum score of six, the mean score for participants was 4.1, for nonparticipants 1.7, and for residents in control communities 2.1.

Conclusion

The impact evaluation research in Ghana provides evidence that credit and education services, when provided together to groups of women, can alleviate poverty, improve health/nutrition knowledge and practice, empower women, and ultimately improve household food security and children’s nutritional status. Although not a focus of the impact research, it is also important to note the program’s performance in terms of financial sustainability. In the six-month period from October 1996 through March 1997, the program had an operating self-sufficiency ratio of 81%, meaning that the interest paid by borrowers covered 81% of the Lower Pra Rural Bank’s costs of delivering the credit and education, covering all operating costs including financial costs such as interest on debt, but not loan loss reserve. While not yet fully financially sustainable, this represents a much higher level of cost recovery than most income-generation interventions and certainly more than traditional health/nutrition education programs. This combination of positive impact and financial sustainability makes *Credit with Education* a strategy with exciting potential for widespread and sustainable impact on nutrition and food security.