Food aid targeting in Ethiopia
A study of who needs it and who gets it

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Abstract

The need for systematic, empirical analysis of food aid targeting and impacts is overwhelming, especially given the large numbers of people concerned and volume of funds allocated to the problem of feeding Ethiopia's food insecure. This research examines the efficiency of food aid targeting in rural Ethiopia based on empirical evidence from a nationally representative survey of 4166 farm households.

A key finding of the study is that there is no significant association between household food insecurity (vulnerability) and food aid receipts—a result of high errors of exclusion and inclusion at both the *wereda* and household levels. Four factors are identified as causes of the high level of targeting error: (1) the primary beneficiaries of food aid programs are found to be households at the extremes in terms of food availability: those with the least and those with the *most* food available; (2) a disproportionate number of female and aged heads of households received food aid, irrespective of their food needs; (3) an inability of the food aid system to reach households outside of the historically deficit areas; and (4) a disproportionate concentration of food aid in the region of Tigray. © 1999 Elsevier Science Ltd. All rights reserved.

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Introduction

For more than two decades, annual distributions of hundreds of thousands of metric tons of food aid have been channeled into safety net programs designed to alleviate the impact of food shortages in Ethiopia. Despite the massive size and duration of this effort, there remain many unanswered questions about its effectiveness and about its longer-term impact on the population it is designed to benefit.

Recently, government and donor concern about Ethiopia's increasing dependence on food aid, coupled with a demand for greater accountability in its use, has spawned acute interest and debate about how efficient the food aid targeting system is in ensuring that food reaches those who need it the most (Sharp, 1997). Effective food aid targeting is also important because food aid, if poorly targeted, will 'leak' into the market (Tschirley et al., 1996); lower prices for selected commodities, a potential disincentive for domestic food production, may result (Jayne and Molla, 1995; Molla et al., 1997; Maxwell et al., 1994). That poorly targeted food aid might disrupt markets and discourage farm production is precisely the issue to which US Title II food aid legislation under the Bellmon Amendment is addressed.[1] Both of these concerns are clearly expressed in Ethiopia's National Policy on Disaster Prevention and Management (TGE, 1993a).

Perhaps the most glaring void in our knowledge base on food aid targeting and its impacts is that left by the absence of empirical research on the subject. The need for a systematic, empirical analysis of food aid targeting efficiencies and impacts is overwhelming, especially given the large numbers of people concerned and volume of funds allocated to the problem of feeding Ethiopia's food insecure. While there have been numerous evaluative studies made by NGOs and others on the impacts of specific food distribution programs in targeted areas, such studies tend to be qualitative, very localized, and anecdotal in nature.[2] Almost always, they have been conducted by the implementers or sponsors of the food aid programs. A recent departure from this general rule is a broad-based evaluation of food aid targeting in Ethiopia by Sharp (1997). While this assessment was sponsored by one of Ethiopia's largest relief agencies (Save the Children Fund—UK), it has helped to clarify the extent of our knowledge about food aid targeting methods and under what circumstances they appear to be relatively more or less successful, based on case studies of various food aid programs and projects implemented in Ethiopia over the past several years.

The present research builds on some of the first steps taken in the Sharp report

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[1] The Bellmon Amendment, Section 401(b) of the United States Government's Agricultural Development and Trade Act of 1990 (the Farm Bill), the authorizing legislation for the PL 480 Title II food aid, provides that: (1) adequate storage facilities are available in the recipient country at the time of exportation of the commodity to prevent the spoilage or wastage of the commodity, and (2) the distribution of the commodities in the recipient country will not result in a substantial disincentive to or interference with domestic production or marketing in that country (USAID, 1985).

[2] Many of the actors in Ethiopia's relief and development community (e.g. USAID, CARE, World Food Program) generate such evaluative studies on a routine basis. Many are referenced and reviewed in Sharp (1997).

by examining the efficiency of food aid targeting in rural Ethiopia based on empirical evidence from a nationally representative survey of 4166 farm households. Food aid targeting is here defined as "restricting the coverage of an intervention to those who are perceived to be most at risk in order to maximize the benefit of the intervention whilst minimizing the cost" (Jaspars and Young, 1995). Our focus is on targeting at two levels. We first assess the degree to which the most food insecure districts (weredas) of the country are selected for food aid distributions; within these areas, we then determine how successful food aid programs are at reaching their intended beneficiaries—the least food secure households. Targeting errors of *inclusion* (distributions to food secure weredas and households) and of *exclusion* (no distribution to food insecure weredas and households) are estimated.

The remainder of this paper is organized as follows: the next section reviews historical trends in food aid distribution. Food aid targeting policies and practice are discussed in the third section. Research methods and data are described in the fourth section, and research results are reported in the penultimate section. The paper concludes, in the final section, with a discussion of key findings, future research needs, and policy implications.

Historical trends and types of food aid distribution in Ethiopia

The quantity of food aid from international and domestic sources that is distributed in Ethiopia has fluctuated from year to year, depending on the extent of food supplied from domestic sources. The annual volume of cereal food aid has ranged from 200 000 metric tons to about 1.2 million metric tons or between 3.5 and 26% as a proportion of total domestic food grain production over the 1985–96 period (Fig. 1). Even in average years, the volume of cereal food aid in a given region can account for 25% or more of the total marketed supply of grain, and up to 50% in drought years.

A substantial portion (over 80% in bad years) of the total annual food aid flow to Ethiopia has been used for emergency relief purposes (Aylieff, 1993). And in
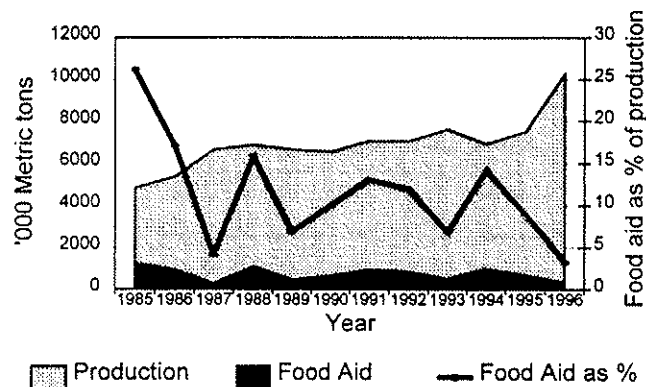

Fig. 1.   Ethiopia food aid and foodgrain production, 1985–96.

times of emergency, the focus of food aid programs tends to be on the short-term objective of saving lives, rather than on longer-term development objectives. In more recent years, with the aim of linking relief with development, the government of Ethiopia has placed greater emphasis on development-oriented aspects of food aid programming. Earlier studies have shown that, in terms of actual kcal of food aid received in 1995–96, just over a third are linked to development programs (Clay et al., 1998). While this represents a positive step toward development-oriented food aid programming, it is still considerably below the current 80% goal set by the Government of Ethiopia in the *Food Security Strategy 1996* (FDRE, 1996).

The major food aid commodities distributed in Ethiopia are cereals (93%), especially wheat, maize, and sorghum; these are followed by oils and fats, and pulses. Wheat constitutes the largest share and accounts for about 80% of the total volume of food aid supplied between 1992 and 1995. Sorghum and maize account for about 8 and 3% respectively, while oils and fats make up another 3% of the total.

Targeting food aid: policy and practice

Ethiopia's official food aid policy states that no able-bodied person should receive food aid without working on a community project in return. This is complemented by targeted free food aid for those who cannot work. The goal, as described above, is to expand work-based food aid to the point where it accounts for 80% of all distributions (WFP, 1995).

While emphasizing the need to give priority to disaster prevention programmes in all development endeavours, Ethiopia's National Policy on Disaster Prevention and Management (NPDPM) states that disaster relief should ensure adequate income transfer for disaster-affected households, promote self-reliance among the beneficiaries, preserve assets to promote speedy recovery, be geared to eliminate the root causes of disaster vulnerability, and contribute to sustainable development. The policy advocates: community participation, giving priority to the most at-risk areas, coordination of efforts, and no free distribution of aid to the able-bodied among the affected population (TGE, 1993a, b).

According to the NPDPM, local-level responsibility for selecting food aid beneficiaries lies with the wereda administration, which in turn is assisted by a committee of elders and community representatives at the kebele or peasant association (PA) level. Neither NGOs, nor the Disaster Prevention and Preparedness Commission (DPPC) have control over the selection of beneficiaries for food assistance. A list of beneficiaries is prepared and submitted to NGOs and/or the DPPC by each wereda committee. Wereda committees are comprised of representatives of the PAs, the wereda Ministry of Agriculture office, and the wereda administrative council.

Fully efficient food aid targeting, as defined above, includes only those intended to benefit from an intervention and excludes all those who are not intended to benefit from the intervention (i.e. no errors of *inclusion* or *exclusion*). But food aid interventions vary considerably, causing differences in how, and how well, targeting is carried out. Important differences can be found in the type of intervention (e.g. free

food, employment generating schemes, food-for-work), the means used to identify the target group (e.g. self-, administrative, or community targeting), the type and amount of benefits associated with the intervention (e.g. kg of wheat or sorghum, litres of cooking oil), and the timing of the intervention. Of course, religious, cultural and political factors further complicate the targeting problem if they feature prominently among the factors that need to be considered when targeting beneficiaries.

Targeting methods can be broadly classified into three types:

> *Administrative targeting*: This occurs when the beneficiaries of an intervention are administratively determined by those other than the intended beneficiaries, using such indicators as asset or livestock ownership, age and gender, nutritional status, access to resources such as land and family labour, etc.
>
> *Self-targeting*: As the name implies, this type of targeting occurs when the type and amount of the benefit attracts only those who are intended to be beneficiaries of an intervention. The use of below-market level wage rates and 'inferior' goods are typical of self-targeting interventions. This is the method advocated by the Ethiopian *Food Security Strategy* (FDRE, 1996, p. 25).
>
> *Community-based targeting*: This is a targeting approach that involves community decisions about the eligibility of households to participate in food aid programs. Decisions are based on community members' prior knowledge of each household's food security situation and coping ability.

There is no targeting method that is universally effective. Each type may work better under certain circumstances and usually includes some elements of the others. Many interventions involve a combination of the three types of targeting methods. For a detailed discussion of the advantages and disadvantages of these targeting methods, the reader is referred to Sharp's study of food aid targeting in Ethiopia (Sharp, 1997)

Data and method

Survey data

The data examined in this research derive principally from the Food Security Survey, implemented in June 1996 by the Grain Market Research Project in collaboration with the Ethiopia Central Statistical Authority. The sample was randomly drawn as a 4218 household subset of the CSA's annual agricultural survey. As such, it is a nationally representative sample of rural, agriculturally-based households. Due to missing data on one or variables examined in this study, the number of cases observed here has been reduced by 1.2% to a total of 4166 households. Reliable estimates of grain production, food availability, and food aid receipts can be drawn from this sample at the national, regional, and sub-regional levels.

The survey addressed a broad array of grain marketing and food security issues including: grain production and marketing, food aid use, impacts of food aid program participation, land ownership and use, household labor and demographics, and vari-

ous farming practices. Some of the key variables from the Food Security Survey examined in this study are described below.

Key study variables

Household food availability and household food aid receipts are two variables that merit special attention here because of their importance to our analysis of food aid targeting efficiencies.

Food availability. Household food availability is a variable that reflects the net amount of food grains (including *enset* as a substitute for grains in certain regions of Ethiopia) available for household consumption after adjusting for market transactions and food exchanges. It is computed as all inflows of food grains over the 12-month period from November 1995 through October 1996 (reported from farmer recall) minus all outflows (other than consumption) over the same period. Since the survey was fielded in June–July 1996, only after the first 8 months of the year-long reference period, were farmers asked about how much grain, if any, they expected to sell or buy during the remaining four months of the period (i.e. until the next harvest). Because most grains are marketed during the first months after harvest, farmers' anticipated sales during the final 4 months amount to a relatively small percentage (11.5%) of all food grain outflows during the year. Anticipated purchases constitute only 5.8% of total inflows.

Thus, household food availability is computed as the sum of own production, purchases, anticipated purchases, and food exchanges received,[3] minus sales, anticipated sales, and exchanges given. On balance, after market transactions and exchanges, farm households in Ethiopia had an average of 1142 kg of food grains available for consumption during this study year, a year of relatively abundant farm production. It is important to note that this measure of food availability does not include food aid distributions. We omit food aid distributions here because this measure of food availability is the indicator of food insecurity or 'vulnerability' against which we will examine food aid receipts.

Food aid. Household food aid receipts, as reported by sampled households, is a variable with several important sub-categories. Farm households were asked how much food aid they received and of what types of commodities, during which months, and under what types of programs they participated (e.g. free food, food-for-work). Overall, 20.0% of farm households participated in food aid programs during the 1995–96 reference period. Free food distributions account for the largest share (64.6%) of food aid received by sampled households, with the remaining 35.4% being distributed through food-for-work programs. Consistent with historical trends, wheat is the most commonly distributed (nearly 60%) food grain, though the proportion in wheat is lower than the more typical 80% or so due to the local procurement of food aid grains in 1995–96, notably sorghum and maize.

For purposes of comparison, we have aggregated food aid receipts across months

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[3] Food exchanges include gifts of food plus food given/received in return for specific goods or services.

and then converted these annual totals to wheat equivalents and kcal. To avoid redundancy in the presentation of results, food aid amounts received from food-for-work and free food programs have been combined. This approach is based on the finding that, in nearly all instances, the two types of assistance show similar patterns and lead to similar conclusions.

Findings

We begin our review of findings with a discussion of the nature and scope of food aid participation and need in Ethiopia, at both the national and regional levels. This is followed by analyses of wereda-level, then household-level food aid targeting results. We conclude the section with an examination of the determinants of food aid distributions in Ethiopia and potential causes of targeting inefficiencies.

The present analysis focuses exclusively on crop-based households. The livelihoods of a small number (1.2%) of households in the Food Security Survey sample are based either on livestock production or non-farm activities.[4] Livestock-based households, often landless and nomadic, are concentrated in the regions of Afar, Somali and Tigray; non-farm households are more broadly distributed across the country. The food security and food consumption of these two groups of non-cropping households are often defined in terms of the value of livestock and animal products (including meat and milk), or in terms of their earnings off-farm. Because of comparability problems in evaluating the food security of these households, they have been removed from the analysis.

Nature and scope of household-level food aid participation and need in Ethiopia

Results show that approximately 5.0 million households (56.8%) are food secure households (i.e. have available 1680 or more kcal per person per day), while the remaining 3.8 million (43.2%) are deficit households.[5] There is sufficient food avail-

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[4] The CSA sample frame is designed to include only households reporting some crop production. The small proportion of households (1.2%) here classified as livestock-based and/or non-farm households are due to slightly different definitions. For present purposes, livestock-based households are defined as those that produce less than one quintal (100 kg) of grains and possess five or more Tropical Livestock Units (TLU). Five TLU could consist of many combinations of animals (e.g. two cows and 36 sheep; a camel, three cows and 19 sheep; etc.). Non-farm households are those with at least 500 Birr in off-farm income and no significant crop or livestock production.

[5] The Government of Ethiopia has set the minimum acceptable weighted average food requirement per person per day at 2100 kcal (FDRE, 1996). Conventional wisdom in Ethiopia is that grains constitute 80% of the average Ethiopian diet, or 1680 kcal. The rest comes from *enset* (false banana), root crops and livestock products. This analysis assumes 80% of the minimum caloric requirement to originate from grains and *enset*, which are used as the basis for our calculation of household net food availability. We recognize that the 80% figure represents only an approximate average for the country and that there is likely to be considerable regional and household variation in this requirement. We expect that data from the CSA Household Budget Survey will enable us to develop regionally-specific estimates of kcal consumed from grains and *enset*, for use in future analyses.

able in the country, before food aid imports, to meet the nutritional needs (1680 kcal PPD) of the entire population. Yet because food is unevenly produced and traded, a large segment of the population, the food deficit population, lacks access to the minimum nutritional requirement. Food consumption in the food secure households is, on average, nearly four times that of the deficit households. The Gini ratio of food availability in Ethiopia, based on these data, is 0.44, indicating high inequality in food access.

When expressed in terms of kcal per person-day, food aid distributions in 1995–96 are found to be highly concentrated in Tigray, a historically food deficit region. Tigray received approximately eight times the national average food aid distribution of 105 kcal per person-day. This regional concentration of food aid is evident in both free food and food-for-work distributions. All other regions received food aid distributions at or below the national average. In absolute terms, households in Tigray and Amhara regions were the beneficiaries, in roughly equal proportions, of over 70% of all food aid distributed in the country.[6]

Stage 1: targeting weredas

Our analysis of food aid targeting efficiencies begins with a look at the selection of weredas relative to the magnitude of their food deficit. Wereda selection is the first stage in the DPPC's efforts to target food aid deliveries (DPPC, 1995). Their goal is to assess the food needs of all weredas in the country and eventually to identify those areas of greatest vulnerability, those in need of food aid intervention.

Overall, 41.5% of the weredas in our sample contained one or more households reporting they received food aid during the past year (Table 1).[7] Efficient wereda-level targeting would mean that those weredas containing a large food deficit population would also be the recipients of food aid programs. Table 1 shows the inefficiency in the current system's ability to target the most needy weredas.

Sampled weredas are classified into quartiles according to the percentage of the sampled households in each wereda that are food deficit (< 1680 kcal per person-day). For the first quartile (the most food secure), less than 19% of sampled households in each wereda in this group fall short of their daily food needs. For the fourth quartile, at the high extreme, 71–100% of households in these weredas are found to be food insecure. If weredas were reasonably well targeted, one would expect a higher percentage of weredas falling in quartile 4 to be food aid recipients. However,

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[6] Comparing our survey estimates of food aid receipts with those reported by the DPPC as food aid amounts delivered during the same 12-month period, we find striking similarities across all major regions. Overall, our survey estimates amount to 82.6% of the DPPC's recorded deliveries. Since the DPPC estimates also include deliveries to urban areas and monetized food aid amounts, it is expected that they should be somewhat higher than the survey estimates, which do not capture urban and monetized food aid.

[7] Undoubtedly, food aid programs reached more weredas than this but, by chance, none of our sample households were among the beneficiaries in these weredas and thus they are classified here as non-food aid weredas. Nonetheless, it is reasonable to assert that not all weredas received food aid and that the targeting process, however effectively it has been applied, has resulted in the distribution of food aid to certain weredas and not to others, largely as reflected in the food aid receipts of our sample households.

Table 1
Percentage of weredas receiving food aid by level of food deficiency in wereda for the 1995–96 season

Food Aid in wereda	Wereda food deficit quartiles				All weredas
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	Low deficit weredas (0–19% of hhs are deficit)	Moderately low deficit weredas (20–41% of hhs are deficit)	Moderately high deficit weredas (42–70% of hhs are deficit)	High deficit weredas (71–100% of hhs are deficit)	
Weredas not receiving food aid	59.3	57.6	59.3%	57.6	58.5
Weredas receiving food aid	40.7	42.4	40.7	42.4	41.5
Total	100.0	100.0	100.0	100.0	100.0
N	91	92	91	92	366

$\chi^2 = 0.113$; sig $= 0.99$.

there are no significant differences across these quartiles in terms of the percentage of weredas that are beneficiaries of food aid programs; all are within a single percent of the national average of 41.5%. A linear correlation between wereda percent deficit households and percent of households receiving food aid confirms the lack of statistically significant association between these two variables ($r = 0.07$, sig. $= 0.19$).

Stage 2: targeting households

The second stage of food aid targeting occurs at the household level. Household-level targeting can take on various forms. Self-targeting, administrative targeting, community-based targeting, and their many hybrid variations are all methods used in Ethiopia (Sharp, 1997). The purpose of this section is not to compare these methods, but to assess the effectiveness of local-level targeting overall. We look first at variations in household food availability and food aid receipts, then at the age and gender of the household head as criteria for food aid eligibility.

A comparison of food deficit and food secure household food aid receipts can be found in Table 2. There appears to be no significant difference between the mean daily food aid received by deficit (101.7 kcal) and food secure (104.3 kcal) households. Expressed as a percentage of households receiving food aid, 22.3% of food deficit households received food aid compared to 18.0% of the food secure households. Although this difference is minor, it its statistically significant. Finally, a linear correlation between household food availability and food aid receipts confirms the lack of statistically significant association between these two variables ($r = 0.01$, sig. $= 0.62$).

Table 2
Comparison of household-level food aid receipts by food deficit/secure status for the 1995-96 season

Food aid	Food deficit/secure status		All households	Sig.
	Food deficit households (< 1680 kcal PPD)	Food secure households (≥ 1680 kcal PPD)		
Mean kcal food aid received PPD in HH	101.7	104.3	102.8	$F = 0.939$
% of HHs receiving food aid	22.3	18	19.9	$\chi^2 = 0.001$
N	1801	2357	4158	

Thus we conclude that food aid targeting in Ethiopia in 1995-96, at both the wereda and household levels, was ineffective at locating those in greatest need of food assistance.

Determinants of food aid distributions and targeting errors

The absence of association between food insecurity and food aid receipts causes us to probe at the possible reasons for this unexpected finding and the food aid targeting errors from which it arises. By breaking out food aid distributions by level of food availability, historical pattern of food aid receipts, and region, we hope to shed light on this question. To estimate the independent effects of key food aid determinants, this section concludes with a multivariate analysis (ANOVA) of household-level food aid receipts.

Food aid distribution by household food availability

To further examine the association between food availability and food aid distributions, we have classified households into four groups based on their food availability (Fig. 2). The two lower food availability groups are comprised of food deficit households: the < 1000 kcal per person-day group isolates the 'extreme deficit' households, many of whom consume less than half the required minimum 1680 kcal required from grains. The other is the 'moderate deficit' group that ranges from 1000 to 1679 kcal per person-day. The remaining two groups enjoy, respectively, moderate and high food security, with the 'high food security' households consuming, on average, twice the minimum kcal requirement.

An important feature of this figure is the concentration of food aid among households in the two extreme categories of food availability. While this is desirable for the extreme deficit group, we must question why it appears among the food secure households, especially those in the most food secure group.

These findings suggest that the absence of association between food need and food

Fig. 2. Food aid receipts by food availability.

aid distributions may be due in large measure to the high volume of food aid flowing to the most food secure households.

Targeting female and elderly heads of households

The *Food Security Strategy* (FDRE, 1996) identifies a need to target the aged and orphans as especially vulnerable groups. Conventional wisdom often adopted by NGOs and local communities holds that female headed households likewise constitute an especially vulnerable group and should therefore be targeted for food aid. The Food Security Survey has no information on orphans, but from it we are able to isolate households headed by women and the aged.

Findings do not support the commonly-held notion that female-headed households are more food insecure than are male-headed households. Net food availability (kcal per adult equivalent person-day) shows no significant difference when comparing male- and female-headed households (Fig. 3). Despite comparable food availability,
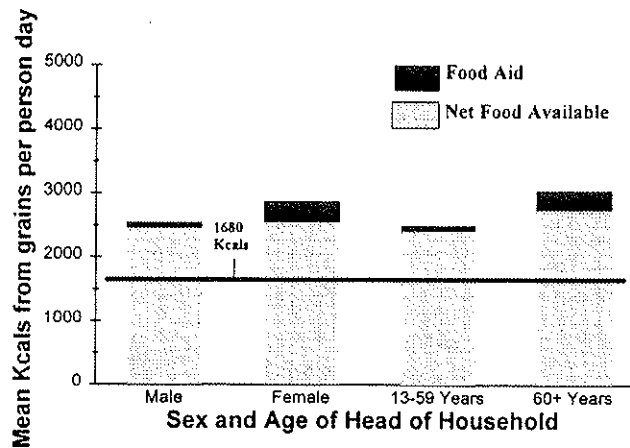

Fig. 3. Food requirements and food access by sex and age of head.

female-headed households receive more than four times the level of food aid received by male-headed households. In other words, women are being successfully targeted, but this targeting may not be appropriate.

Fig. 3 also calls into question the belief (conventional wisdom) that elderly heads of households are less food secure than younger household heads. Indeed, net food availability is significantly higher in households headed by persons aged 60 + years than in younger households. Even though older heads of households are more food secure than younger heads, they receive disproportionately more food aid by a factor of four. Thus, as with female-headed households, targeting the aged may not be appropriate. However, this does not imply that gender and age inequalities do not exist *within* households.

Food aid distribution in 1995–96 by historical pattern of food aid deliveries

Food aid distributions in 1995–96 closely followed the historical pattern of food aid deliveries in Ethiopia. Fig. 4 shows that households are more likely to receive food aid in the current year if they received food aid in past years. The relationship is strong and significant: food aid distributions grow increasingly higher as the number of past years of food aid increases. Households with five or more years of food aid in the past receive more food aid than all others by a wide margin.

Years of past food aid is an indicator of the extent to which the food aid system has built up presence and infrastructure over time. The existence of such a build-up is a powerful predictor of ongoing food aid deliveries. Households in the regions of Tigray and, to some degree, Amhara are the most likely of all to have received food aid in past years, a reflection of the severity of drought and famine known to those areas.

Regional effects

There is significant regional variation in the amounts of food available to households through their own production and net transactions, and, most of all, through
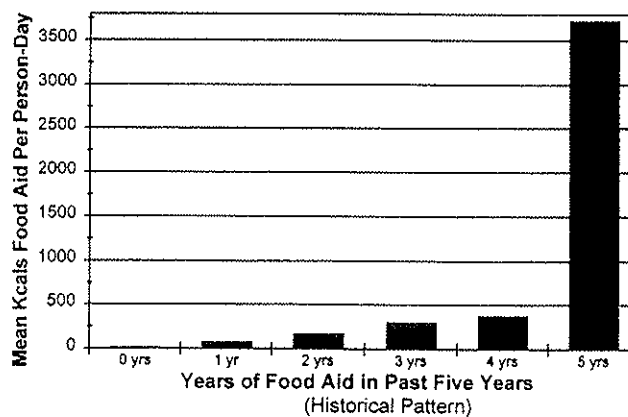

Fig. 4.   Food aid in current year (1995–96) by past years of food aid participation.

food aid receipts (Fig. 5). In the aggregate, households in all five regions meet the 1680 kcal requirement for food availability per person-day, even without the help of food aid. Because the 1995–96 harvest was unusually strong, it departs from the historical trend of deficit food production. In terms of food aid distributions, however, the region of Tigray stands out despite maintaining a level of food security comparable to other regions.

Food aid receipts: analysis of variance

To examine the relationship between food availability and food aid receipts while holding other effects constant, we conducted an analysis of variance and multiple classification analysis of food aid receipts using total kcal of food available per person-day as the primary factor. The model also tests the independent effects of region as a determinant of food aid distributions, and of other variables included in this study. Table 3 reports the results of this analysis; we discuss them in the order reported.

Food availability. The unadjusted means in column (a) confirm earlier observations that households in the extreme deficit and high food security categories tend to be the primary beneficiaries of Ethiopia's food aid programs. Column (b) adjusts for the influence of region on this distribution. Our conclusion from Table 3 is that the relationship between food availability and household food aid receipts is not conditioned by region. Nor is it significantly affected by a battery of covariates thought to have a potential impact (column c).

Region. The powerful effect of region on food aid receipts remains strong and significant, even when controlling for food availability (column b) and our set of covariates. The flow of food aid to Tigray is shown to be exceptionally high at all levels, though it is reduced from a predicted mean of 824 to 455 kcal per person-day when adjusted for the influence of the covariates. The covariate primarily responsible for this reduction is previous years of food aid. In other words, part of the
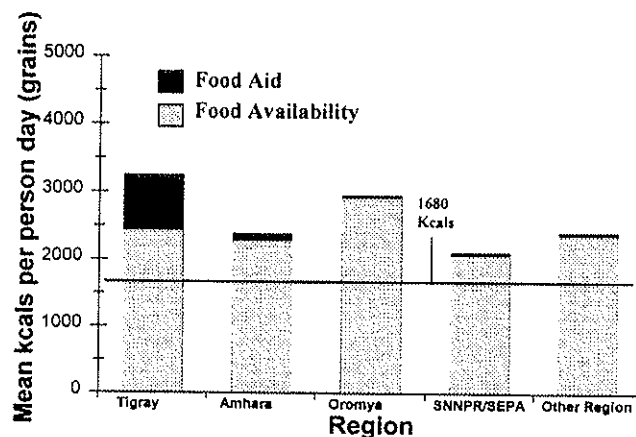

Fig. 5. Food availability and food aid by region.

Table 3
ANOVA and multiple classification analysis of food aid distributions by food availability and region, controlling for covariates[a]

	Predicted mean kcal food aid per person-day			
	Unadjusted (a)	Adjusted for factors (b)	Adjusted for factors and covariates (c)	Sig. of main effects
Food availability (kcal) per person-day				0.484
Extreme food deficit HHs (< 1000 kcal)	141	117	97	
Moderate food deficit HHs (1000–1679 kcal)	58	72	71	
Moderate food security HHs (1680–2799 kcal)	70	76	75	
High food security HHs (2800 + kcal)	133	135	152	
Eta/beta	0.02	0.02	0.02	
Region				0.000
Tigray	829	824	455	
Amhara	99	102	64	
Oromya	23	22	80	
SNNPR or SEPA	30	29	86	
Other regions	35	38	79	
Eta/beta	0.13	0.13	0.06	

[a]Covariates (sig.): age (0.024) and sex (0.023) of head; food aid in wereda (0.763); land (0.696); TLU (0.523); off-farm income (0.976); household labor (0.181); years of food aid (0.000); and rainfall (0.776).

reason why food aid receipts in Tigray are so high in this particular year (1995–96) is because they have been high there in past years and the aid continues to flow. Remaining differences in the amount of food aid received by households in Tigray, compared to all other regions, are due to factors not measured in this study.

These results reinforce what we have learned from the preceding bivariate analyses: food aid receipts are not determined by need (food available per person-day). Rather, they are determined by: (1) characteristics of the head of household—women and aged heads are targeted independent of their need, (2) past participation in food aid programs, and (3) regional effects (Tigray). Other variables such as off-farm income, livestock ownership, rainfall and elevation, and residence in regions with relatively low food aid flow have no effect on household participation in food aid programs.

Conclusions, research implications, and policy recommendations

The purpose of this study has been to examine food aid targeting efficiencies and the determinants of food aid distributions in Ethiopia during the 1995–96 agricultural

year. Based on our analysis of data from a nationwide, randomly selected sample of 4166 farm households we have derived a set of findings, implications, and policy recommendations that we believe will help inform ongoing debate in the area of food aid targeting.

Summary of findings

A key finding of the study is that there is no significant association between household food availability (need) and food aid receipts (either free or food-for-work) during this sample year—a result of high errors of exclusion and inclusion at both the wereda and household levels. This finding holds true even when controlling for other important characteristics of the households such as age, gender, and education of household head, off-farm income, land and livestock ownership, family labor availability, and fundamental agroecological characteristics of weredas such as rainfall and elevation.

Four factors have been identified as causes of the high level of targeting error and the resulting low correlation between food insecurity and participation in food aid programs. They are as follows:

Both the needy and food secure are beneficiaries. First, the primary beneficiaries of food aid programs are found to be households at the extremes in terms of food availability: those with the least food available and those with the most food available. This pattern seems to hold across numerous regions of the country. While targeting efficiencies are enhanced by the provision of food aid to the most vulnerable group, they are seriously reduced by the flow of food aid to highly food secure beneficiaries. Sharp, in her 1997 review of food aid targeting in Ethiopia, and Hill (1994) have alluded to the potential for community-level factors to unduly influence the system in the selection of beneficiaries. Such factors may include, "deliberate manipulation of distribution systems by those in control... resistance by local authorities to the general principle of prioritizing the needy, and the political use of food aid for electioneering" (Sharp, 1997, p. 34). Our data do not permit us to count out these sorts of explanations for why highly food-secure households receive the quantities of food aid that they do.

Over emphasis on women and the aged. Second, the *Food Security Strategy* (FDRE, 1996) and the beneficiary selection criteria used by several key NGOs involved in the distribution of food aid underscore the special vulnerability of women and the elderly under conditions of food shortages. Our data show that a disproportionate number of female and aged heads of households received food aid, irrespective of their food needs. We found that households headed by women and those aged 60 years and above are no less food secure than those headed by men or younger farmers. Thus, the practice of targeting women and the aged, to the extent that it is used exclusively in place of truly need-based criteria, has contributed to increased targeting error.

Lack of flexibility in the food aid system. Third, the strongest determinant of food aid receipt is the number of years in the past that households have received food aid. This is largely because years of food aid reflect the progressive build-up of

'institutional capacity' in the food aid delivery system over time. By this we mean the investments made by government agencies and NGOs in such things as personnel, contacts and knowledge of the area, offices, trucks, and institutional reputation. All of these investments create a compelling reason to continue the flow of food aid to the same areas it has always gone—areas known for chronic drought and food short-fall. Because of the tremendous flow and momentum built up in the food aid delivery system, altering its course to meet the needs of deficit households in other areas that may not benefit from the same extent of infrastructure and institutionalization, is a formidable challenge, one that was not met in 1995–96. Improving the flexibility of the food aid delivery system to extend or shift the safety net when conditions require is a concept that clearly needs greater attention; current inflexibilities in the system are a major cause of food aid mistargeting in Ethiopia.

Regional concentration of food aid. Fourth, households in the region of Tigray are far more likely to receive food aid, regardless of need, than households in any other region, thereby decreasing targeting efficiency. Part of the reason for this dis-proportionate flow of food aid to the region is that Tigray is one of the country's historically deficit areas in which a significant investment in food aid institutional capacity has been made. The region also has substantial community-based develop-ment projects and large public works programs (micro-irrigation, dam construction, soil conservation, etc.) that are implemented as food-for-work activities. Because of the labor-intensive nature of these projects, it is conceivable that a large number of food secure households may benefit from participating in them. As Sharp (1997) puts it, "despite the openness and fairness of the community targeting system in Tigray, the tendency to spread food aid within communities, and the pressure on the *baito*[8] members to include as many people as possible, seem to be the same here as elsewhere."

But only about half of Tigray's success in attracting food aid can be accounted for by such built up capacity and infrastructure. Multivariate analysis reveals that other factors must also be taken into consideration, factors not directly measured in this study. Just as there may be pressures at the community level to direct the flow of food aid to non-needy households, regional biases may also be the result of political influences and other pressures on the food aid delivery system.

Implications and recommendations

We believe that it is important to conclude this report by reiterating that this is a cross-sectional study conducted during a relatively good harvest year. Most regions of Ethiopia reported strong agricultural yields, even the chronically deficit regions such as Tigray and Dire Dawa. It is conceivable that in a more typical year, or even in a particularly bad year, that some of our conclusions would differ from those reported in this study. To strengthen the generalizability of present findings, there

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[8] *Baito* is the smallest administrative unit in the Tigray region, comparable to the peasant association (PA), elsewhere in the country.

is need to replicate this study during at least one average and one relatively poor harvest year.

That said, however, we must also note that most of the improvement during good harvest years such as this one invariably accrues to the more productive and already food secure households. It is estimated that during the relatively poor production years of the late 1980s, 52% of Ethiopia's population fell below the 2100 kcal per person-day (FDRE, 1996). By contrast, during the current and relatively good year, with food availability up 30% or more above levels in the late 1980s, the proportion of food insecure households has declined only modestly to 43.2%.[9] This suggests that the size and conditions of the 1995–96 deficit population may not be so different after all and that Ethiopia's food insecurity problems may extend well beyond the vagaries of seasonal rainfall. As it is throughout Africa, food insecurity in Ethiopia is undoubtedly also structural in nature, deeply rooted in inequality and reinforced by poverty. But this hypothesis is the subject of another study.

Follow-on research is also needed to examine the potential disincentive effects that observed targeting errors may exert on food grain productivity and marketing in areas where they may occur, and to which the Bellmon Amendment is specifically addressed. By the same token, the need for empirical research into the hypothesized 'development effects' of food aid is equally pressing.

Based on the results of this study and subsequent discussions with major participants in the food aid delivery system, several key study implications and recommendations for improving food aid targeting in Ethiopia have emerged. They are as follows:

Increase flexibility in the food aid delivery system. Ethiopia's food aid delivery system has built up capacity primarily in areas of chronic food deficit. As a result, food aid continues to flow to these historically deficit areas even in years such as 1995–96 when some of the more severe food shortages are found in other areas of the country. The key challenge is to modify the system in ways that will make it more flexible, with the capacity to respond to food needs *wherever* they may occur. The government of Ethiopia, together with the major food aid donors and NGOs involved in food aid deliveries, must begin to address this critical problem. We believe that the most successful approach will include an open forum for debate and review of available options.

Emphasize area targeting. More emphasis should be placed on identifying the most food insecure weredas (area targeting) as the first step in the food aid targeting process. Efficient area targeting has a greater likelihood of reaching vulnerable households, and possibly at lower cost, than does household-level targeting. Also, the effectiveness of household targeting may be enhanced by accurate area targeting, at least in those areas where all or most households are food insecure.

Complete area targeting guidelines. Current efforts by the Disaster Prevention and

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[9] Since FDRE (1996) measures food insecurity based on total food consumption of less than 2100 and the present study defines food insecurity as total grain consumption of less than 1680 kcal, comparison of the two figures relies on the assumption discussed earlier that grains constitute 80% of total calories consumed in Ethiopia.

Preparedness Commission (DPPC) in the preparation of food aid targeting guidelines at the national and regional levels and for the various socio-economic systems (sedentary agriculture, pastoralists, cash-crop producing areas, etc.) should be finalized and implemented.

Expand area vulnerability profiles. Current efforts by the DPPC to prepare vulnerability profiles for disaster-prone areas should continue and be expanded to cover more areas. Vulnerability profiles facilitate needs assessment and the identification of appropriate interventions in the areas they cover.

Underscore national policy on food aid targeting. Consistent with the National Policy on Disaster Prevention and Preparedness, priority should be given to targeting the most food insecure and poorest of the poor households in emergency (employment generation schemes) as well as food aid development (food-for-work) projects. Wereda and peasant association officials currently hold authority for the local-level selection of food aid beneficiaries. Increased sensitization and awareness of the National Disaster Prevention and Preparedness Policy should be pursued aggressively to facilitate a better understanding of the National Policy among those entrusted to implement it.

Rethink the guidelines and criteria used for identifying the most vulnerable households. The current focus on women and the elderly is not an effective way to target food insecure households. Indicators that reflect household food availability *per adult equivalent* will help improve targeting efficiencies. Recent research in the area of food security indicators may help Ethiopia develop the approach and methodologies needed to identify vulnerable households easily and at an acceptable cost (Haddad et al., 1994; Khan and Riely, 1995; Maxwell, 1996).

Examine directly the possibility that targeting errors not explained by factors measured in this study may be due to national and local-level political pressures on the food aid delivery system. The DPPC must actively reinforce the importance of targeting vulnerable households and assist local-level food aid administrators in eliminating the pressures and incentives to distribute food aid to the more food secure households.

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