Food for Work and Income Distribution in a Semiarid Region of Rural Kenya: An Empirical Assessment

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Abstract. This paper presents an analysis of the effects of a food-for-work programme (FFW) on the patterns of income distribution in the recipient community. A relative mean income analysis of the size distribution of incomes was undertaken. When the value of the food received from FFW is excluded from the analysis, FFW participants and nonparticipants had virtually identical income levels, particularly in the lowest income groups. FFW resulted in more equal patterns of income distribution, with the lowest income groups being the major beneficiaries. Those results are consistent with the aims of FFW to simultaneously address the food needs of the poor and to provide the basis for capital formation and improved income at the farm level. Effective programme design is essential to achieve the desired results.

Introduction

Food aid relaxes the capital constraint of nations at the macroeconomic level (Lewis, 1964) and of farmers who receive food aid at the microeconomic level (Bezuneh, 1985). Accordingly, food aid programmes that target low income food producers contribute directly to the capital formation process at the firm level. Additional physical assets may be created in the community whenever the food aid is channelled through food-for-work (FFW) projects that use "surplus" labour to build community infrastructure. Hence, FFW provides a means of participation in the development process and, in so doing, overcomes one of the major shortcomings of rural development policies; i.e., FFW demonstrates to insecure farmers that they can share the benefits of expansionary economic growth. Ideally, then, FFW can simultaneously achieve such objectives as increased agricultural output and more equitable distribution of income (Deaton, 1980; Maxwell and Singer, 1970; and Schuh, 1979). The multifaceted economic issues associated with food assistance programmes were reviewed most recently in the comprehensive *Report of the World Food Programme* (Government of the Netherlands, 1983).

Food-for-work projects are viewed as one means of reaching the poorest of the poor in recipient countries. If successful, such projects can permanently raise the level of income and alter the income distribution pattern in recipient communities. Given the potential dynamic role of FFW in the economic development process, knowledge of the distributive impact of food aid is important for determining both its welfare and growth implications. Maxwell and Singer (1970) identified the positive income distribution effects of food aid as one of its major benefits, but relatively little attention has been given to measuring the actual effects on income distribution in recipient communities.

The purpose of this paper is to analyze the effects of FFW on the size distribution of incomes among farm households in two communities of the Baringo District, Kenya. Our analysis will test the null hypothesis that the FFW programme had no effect on the income distribution pattern in the recipient communities. Specific questions addressed include:
- What was the prevailing pattern of income distribution in the recipient community?
- Did lower income groups participate proportionately in the FFW programme?
- Did FFW participation tend to produce relatively more or less income equality?

Data Sources and Method of Analysis

Household survey data were collected over a 6-month period (September 1983-February 1984) in the Ewalel and Marigat locations in the Baringo District, using 16 local residents trained by the authors. A comprehensive census of households was taken as a first step. From the resulting list of 1030 households, a random sample of 300 was drawn without replacement. Of the 300 households surveyed, 100 were found to be participants in FFW projects supported by the UN/FAO World Food Programme during the study period (February 1983-January 1984). Income data for a 1-year period were obtained for all members of each household by calculating the amount derived from own-farm production, from wages earned on other farm and non-farm work, and on the market value of commodities received from the FFW programme. Since some income information involved mental recall, any apparent questionable figures were compared with data from secondary sources by the research team. Income from all sources was summed to provide total household income for each

family. Household income with and without FFW could also be determined for each household.

In order to analyze the pattern of income distribution, relative mean incomes (RMI) were calculated for each income class grouped by quintiles. The RMI measures were developed by first arraying households from lowest to highest incomes and grouping by quintiles with Q_1 representing the lowest income group and Q_5 the highest income group. Then the mean income of each quintile was calculated as a proportion of the mean income of the sample. The resulting RMI measures of income distribution provide a widely accepted basis for evaluating patterns of income distribution (Solow, 1967).

Results of Analysis

In the absence of longitudinal data, measuring the impact of FFW requires that reasonable estimates be made of what household income would have been if FFW had not been introduced into the community. When a FFW project is implemented in an agricultural community, the household income of local farmers will reflect both the direct impact of the market value of food received from the project and indirect impacts derived in own-production from new inputs created by the project (e.g., roads, wells, and water harvesting techniques). For FFW participants, the value of food received is strictly additional income if no labour substitution occurs between FFW and other income earning opportunities (i.e., if "surplus" labour is used on FFW projects). Secondary effects may accrue to either participants or nonparticipants. For example, the forage improvement projects using water harvesting techniques observed in the study communities are likely to benefit both groups since most herds were grazed on common property. The impact of FFW on income distribution could be measured just as if the change had occurred from one time period to the next if we can reasonably ascertain that no substitution effect has occurred, particularly for lower income groups. In fact, more extensive analysis of household labour allocation has shown that no such substitution effects were realized for the project area (Bezuneh, 1985). Nevertheless, illustrating the absence of substitution effects using the RMI technique would add clarity to this analytical approach.

In order to ascertain whether the food received could be viewed as strictly additional, incomes from all sources except food aid were compared for FFW participants and nonparticipants by income quintiles. The quintiles were based on the income distribution specific to each group, participants versus nonparticipants. The RMI for each quintile is based on the mean income of the specific quintile group expressed as a proportion of the mean income of the total sample. That comparison of incomes, excluding food aid received, is presented in Table 1.

Table 1—Income of FFW Participants and Nonparticipants,
Baringo District, Rift Valley Province, Kenya, 1983

	Q_1	Q_2	Q_3	Q_4	Q_5
Participants (N = 100):					
Income*	826	1579	2474	2918	6193
RMI	0.26	0.51	0.79	0.94	1.99
Nonparticipants (N = 200):					
Income*	798	1525	2277	3640	8080
RMI	0.26	0.49	0.73	1.17	2.60

[*Shillings.]

Although participants in the lower three quintiles had slightly higher incomes than nonparticipants, their RMIs were almost identical for Q_1, Q_2, and Q_3, reflecting no apparent substitution effects for low income quintiles unless they were offset by compensating secondary effects. In other words, low income participants appear to have almost identical incomes to nonparticipants before income derived from FFW is introduced. The RMI was decidedly higher for nonparticipants in Q_4 and Q_5, suggesting that some labour substitution may have occurred away from other income generating activities in favour of FFW. However, as stated earlier, other analyses did not support that hypothetical possibility.

In comparing income levels with (or post-FFW) and without (or pre-FFW), households are first maintained in their original quintile groupings. The basic income changes associated with the FFW programme are illustrated in Table 2. In other words, the poorest 20 percent of households (Q_1) had average incomes of 807 shillings without including the value of food gained from FFW. The income of those households increased to 1623 shillings as a result of FFW. Forty percent of the households in the lowest quintile (24 of 60) had one or more members who participated in the FFW programme. The income of next highest quintile (Q^2) increased from 1,543 to 1998 shillings with a 34 percent participation rate, and from 2343 to 2963 shillings with a 35 percent participation rate for Q_3. Participation rates were lower for Q_4 and Q_5.

Table 2—Income Effect of FFW, Baringo District, Rift Valley Province, Kenya, 1983

	Q_1	Q_2	Q_3	Q_4	Q_5
Without FFW:					
Mean income*	807	1543	2343	3400	7451
With FFW, original quintiles, FFW participants:					
Numberö	24	20	21	17	18
Percentü	40	34	35	28	30
Mean income*	1623	1998	2963	4087	7923
With FFW, regrouped quintiles, FFW participants:					
Numberö	5	14	25	24	32
Percentu	8	23	42	40	53
Mean income*	1032	1968	2912	4133	8548

[*Shillings. öNumber of households in the quintile with one or more FFW participant. üPercent of households in the quintile with one or more FFW participant.]

The lowest income groups participated relatively heavily in FFW and experienced more significant income gains due to the value of food commodities received. Thus, FFW appears to be effectively reaching the poorest of the poor in the recipient communities. The regrouped quintiles in Table 2 reveal the income levels after the households were rearrayed. Here, the final overall results of FFW on the aggregate income distribution in the community can be determined.

With FFW introduced into the communities, the mean income level is elevated from 3109 to 3719 shillings. After regrouping, the lower quintiles contain markedly fewer FFW participant families, dropping from 40 percent to 8 percent in Q_1 and from 34 percent to 23 percent in Q_2. Hence, FFW participation appears to be associated with substantial income increases, particularly among the lowest income groups in the communities.

The changes in income distribution are revealed more precisely by comparing the RMI for each classification (Table 3). When food received from FFW was not considered, the RMI ranged from 26 percent of the sample mean income for Q_1 to 240 percent for Q_5. The post-FFW distribution for the same quintile groupings revealed a narrower range of 44 to 213 for Q_1 and Q_5, respectively. More significantly, the RMI increased for each of the lower three quintiles, was virtually the same for Q_4, and decreased for Q_5. Again, the relative magnitude of the changes in RMI were greater for the lower income quintiles.

Table 3—Distributive Impacts of FFW, Baringo District, Rift Valley Province, Kenya, 1983

	Q_1	Q_2	Q_3	Q_4	Q_5
Without FFW:					
RMI	26.0	49.6	75.4	109.4	239.7
With FFW, original quintiles:					
RMI	43.7	53.7	79.7	109.9	213.1
With FFW, regrouped quintiles:					
RMI	27.8	52.9	78.3	111.2	229.9

The overall changes in income distribution can be seen by comparing the income levels of the without-FFW quintiles and the with-FFW regrouped quintiles in Table 2 and the RMI measures in the first and third columns in Table 3. The RMI range is less for the regrouped quintiles, and the RMI of the lowest four quintiles has increased while the RMI for Q_5 has declined. That pattern reflects a more equal income distribution in the communities after introduction of the FFW program.

Implications

The null hypothesis and the three questions raised in the introduction can now be assessed. FFW appears to have a rather sharp and distinctive impact on the income distribution of these communities, and the greater equality appears to be strongly associated with the degree of participation by families in the FFW programme. Lower income groups are the major beneficiaries of the programme. Given the relatively greater income elasticity of demand for food among the poor, the FFW programme can be expected to stimulate demand for food, which may, in turn, provide price incentives that lead to greater local production of food products.

The Brandt Commission warned that "food relief programmes often cost more in one year than would the five-year local investment programmes which might have made them unnecessary" (Brandt, 1980, p. 94). The FFW project observed in Kenya is an attempt to use food relief to simultaneously undertake the local investment programmes that mitigate the need for food aid. In this Kenyan example, the programme is used to promote a wide range of development supporting inputs (e.g., water harvesting, irrigation, forage improvement, reforestation, and fencing) and other community specific public projects (e.g., roads, dams, and bridges). Thus, the direct effects of FFW observed in this study represent minimal expected changes. More significant long-term income gains are anticipated as the returns from the newly created agricultural inputs from FFW are reaped by both participants and nonparticipants.

A tentative analysis of the likely shifts in production patterns due to the introduction of FFW was undertaken using a linear programming method (Bezuneh, 1985). The results revealed that higher incomes and increased reinvestment in own-farm production would eliminate the need for food aid in the long run. The pattern of increased reinvestment in own-farm production resulting in higher income streams illustrates the capital forming potential of targeted FFW programmes and their ability to alleviate the harsh conditions of the lowest income groups in recipient countries. Initial

access to land was a clear precondition for the apparent success of the programme, a point which should not be lost to agricultural economists. Clearly, effective project design and implementation is the key to success where targeting a low-income group is required.

Conclusions

Our analysis of farm households in a semiarid area of Kenya revealed that a FFW project significantly altered the pattern of income distribution in the community. When the value of the food received from FFW participation was excluded from calculations of household income, the incomes of FFW participant and nonparticipant households were virtually identical, particularly for the lower income groups. However, when the value of food received from FFW was included as income, more equal patterns of income distribution were revealed. The major beneficiaries were the lowest income groups in the communities. Because food aid relaxes the capital constraints of farm producers, it can contribute directly to capital formation and permanently higher incomes of the poorest households that have a land base for farm production. The effects will, in turn, have significant macro (or community) development implications. Careful project design and implementation is required to achieve the targeted aims.

Note

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Discussion Opening – *Brian D'Silva*

Food aid is given at four different levels: level A is donor countries, level B is recipient countries (who may also be donors to level C), level C is recipient regions within a country, and level D is specific target groups who act as recipients from donors at level C. This framework provides us a mechanism to look at factors affecting food aid decisions and the impacts of food aid, and we can also relate the three papers using this framework. A key aspect of this framework is the existence of backward and forward linkages among the various levels.

Konandreas focussed on levels A and B. Grigsby and Simpson focussed on the linkages between levels A and B. Because Grigsby and Simpson argue from the US viewpoint, food aid could have been used to increase exports and reduce domestic surpluses, but from the Colombian viewpoint it was used as a source of financing food imports. While none of the papers focussed on food aid at the regional level, Deaton and Bezuneh focussed on the impact of a food-for-work programme at the village level.

We need to carry the analysis a step further. All three papers focussed on economic relationships, but, in the case of food aid, we also need to incorporate the political dimension and the issue of linkages. I will try to illustrate this point with historical examples as well as the current situation in Sudan, which, in 1984/85, will probably receive the most food aid of any country, primarily due to the effects of a drought.

From the donor perspective, domestic political forces that an impact on food aid allocation decisions. Konandreas pointed out that, in 1973/74, food aid allotments by donors were at their lowest level even though a major drought occurred in the Sahelian countries. At the same time, high domestic food price inflation occurred in the USA, which probably made it politically difficult for the USA to increase food aid. Paradoxically, in 1984/85, when we also saw the effects of a drought in Africa, decision makers in the USA had to look at domestic factors such as declining commodity prices and also a very large budget deficit. Furthermore, US food aid was historically used to reduce surpluses and for market development but is now becoming important as a tool for policy dialogue and reform as we have seen in the case of Sudan.

At the recipient country level (level B), factors such as budgetary allocations for commercial versus concessionary imports could affect decisions on food aid. The existence of a donor would suggest that the country might not necessarily take all the necessary policy decisions to increase domestic production. We saw that, in 1984, Sudan's cotton production took priority over wheat production even though the country was suffering from a drought. Further instances could be used to analyze allocations of food aid to regions within a recipient country as well as to specific interest groups such as urban residents. In analyzing linkages, we should try to focus on both the long- and short-term effects of food aid on domestic food production in donor and beneficiary countries. For example, will the existence of a food aid allotment necessarily give producers in the donor country the signal than a larger market exists than may be possible commercially and hence lead to continued excess production? Similarly, will decision makers in the recipient countries not make the necessary policy changes to increase domestic production due to the existence of a food aid donor?

Discussion Opening – *Phillips Foster*

All three papers show optimism for the development opportunities inherent in the FFW concept. Deaton and Bezuneh, of course, address the FFW topic directly, but the other two papers offer hope of greatly expanded utilization of this concept. Yet, this concept has been put to very limited use in the various food aid programmes around the world.

Two constraints to the use of FFW are its heavy reliance on administrative effort (a resource that, at least in the US case, the US Congress usually severely restricts within the USAID budget) and the associated capital items necessary for most FFW projects (e.g., cement and shovels) are scarce.

Grigsby and Simpson conclude that US food aid is a market export programme (to expand market demand and provide purchasing power to the importer) rather than a commodity subsidy programme (that provides cheap exports). What is the difference between a market export programme and an export subsidy programme as described here? Why do we, in this case, make that distinction?

General Discussion – *Eduardo Segarra*, Rapporteur

Most of the discussion in this session centred around the adequacy and possible use of FFW as a development instrument in nonindustrialized poor countries. Many questions related to the issue of implementation of FFW in different countries and the kind of problems such programmes could encounter.

Other questions related to the possibility of either substituting for or complementing existing programmes such as food aid with FFW, as a means to stimulate development. Also, issues such as income distribution and overall effectiveness of FFW programmes were raised.

Deaton agreed that a programme such as FFW may be difficult to implement in some countries, mainly because of political and physical (in terms of availability of inputs) constraints. Also, he agreed that, in fact, the administrative aspects of such programmes could be quite costly and difficult to monitor.

With respect to the possibility of either substituting for or complementing existing programmes with FFW as a means to stimulate development, Deaton agreed that the complementary alternative should be the one to be considered since an evaluation of the FFW against the existing programmes could be made. Then, he pointed out that a programme such as FFW should be flexible enough so that variations could be made according to a particular country. Also, the nutritional benefits (in terms of providing an adequate diet) of FFW were pointed out.

Participants in the discussion included J.N. Barmeda, M. Kamuanga, S. Pudasaini, R G Spitze, and T Weersma.