Vouchers versus Grants of Inputs: Evidence from Malawi's Starter Pack Program

AMY E. GOUGH, CHRISTINA H. GLADWIN, AND PETER E. HILDEBRAND

Abstract: The majority of Malawi's smallholders use low purchased-input technologies and as a result, produce low yields; 40 to 60 percent of rural households face chronic food insecurity for two to five months every year. These households are therefore in need of a program to increase their productivity and improve their food security. Such a program, entitled the "starter pack program," was initiated in 1998/99 by Malawi's Ministry of Agriculture in collaboration with donor agencies. The program aimed to distribute "starter packs" to all farming households, containing small packs of hybrid maize seed, fertilizer, and either groundnuts or soybeans. The 1999 starter pack distribution also included a pilot voucher project that distributed two different types of vouchers, in a test to see whether the vouchers received by some of the farmers were more effective than the packs received by other farmers. The purpose of this paper is to evaluate that test. We examine the differences between the three distribution systems of the starter pack, starter pack voucher, and flexi voucher, in order to determine which is the more effective tool for improving food security among Malawian smallholder farmers. We also determine if the impacts depend on particular household characteristics, including gender and marital status of the household head.

Introduction

Within the small African country of Malawi, agriculture provides employment for nearly 90% of all households, accounts for 40% of the GDP, and generates 77% of the revenue from Malawi's exports. [1] The Ministry of Agriculture estimates that 2,786,576 households are farming families. [2] The majority use low purchased-input technologies and as a result, produce low yields and experience food insecurity chronically, i.e., before the April harvest every year. In southern Malawi, 40 to 60 percent of rural households face chronic food insecurity for two to five months every year. [3] These households are therefore in need of a program with the potential to increase their productivity and improve their food security.

In both the 1998/1999 and 1999/2000 planting seasons, such a program -- entitled the "starter pack program" -- was initiated by the Ministry of Agriculture in collaboration with numerous international donor agencies. The program aimed to distribute "starter packs" to all farming households, containing small packs of hybrid maize seed, fertilizer, and either groundnuts or soybeans. The packs were intended to allow smallholders to plant 0.1 hectare of land with modern yield-increasing inputs including fertilizer. Additionally, the 1999 starter pack distribution included a pilot voucher project that distributed two different types of vouchers in a test to see whether a voucher distribution system was more effective than

ISSN: 2152-2448

distribution of a bulky package of free inputs, and if so, which kind of voucher was more effective.

This paper aims to evaluate this test, and examine the differences between the three distribution systems of the starter pack, starter pack voucher, and flexi voucher, in order to determine which is the more effective tool for improving food security among Malawian smallholder farmers. We also analyze how the three alternative grant distribution systems impact rural households, and see if the impacts depend on particular household characteristics, including gender and marital status of the household head. A priori, we expect grants of starter packs to benefit female headed households (FHH) more than male headed households (MHH), because proportionately more FHHs are found in the poorest 40 percent of Malawi's population and are therefore more likely to be chronically food insecure. [4]

THE CURRENT PROBLEM OF FOOD INSECURITY IN MALAWI

Malawi is chronically food insecure, according to criteria adopted by the Food and Agricultural Organization of the United Nations (FAO). [5] They consider a country or region is food secure if "all human beings at all times have physical and economic access to the basic foods they need." [6] Clearly, Malawi does not meet these criteria. [7]

The problem of chronic food insecurity in Malawi is a result of numerous recent shocks and stresses to the livelihood systems of Malawi's rural smallholders. Shocks include severe droughts in 1991 and 1993 followed by the collapse of the credit system in 1994 and several debilitating devaluations of the Malawi Kwacha (MK). [8] Compounding these shocks are more routine but persistent stressors, which include annual population growth rates of 2.5 to 3 percent, increasing fertilizer prices, and as a result, depleted soils and low yields per hectare. These factors, along with social considerations such as the high incidence of HIV/AIDS, changing patterns in labor migration, and adaptations to the newly established market structure, have pushed farmers away from the sole activity of farming and towards secondary or tertiary nonfarm activities to improve food security.

Devaluations of Local Currency

During the 1999/2000 starter pack and voucher distribution, the Malawi Kwacha ranged from 38-48 per US $1.00. Agricultural input prices increased so much that a ten-kilogram bag of commonly planted Panner maize seed cost MK 595, a fifty-kilogram bag of urea fertilizer cost MK 825, and a fifty-kilogram bag of 23:21:0 +4s fertilizer cost MK 780. These increased prices forced smallholders to either abandon fertilizer purchases or drastically reduce them.

Increasing Population Density

Population pressures have reduced the amount of land available to smallholders. With many households in the southern region farming only 0.3 hectares or less, Malawi's most densely populated region has no land in natural fallow systems, as does its neighbor, eastern Zambia. Maize continuously cultivated on depleted soils with little to no soil amendments are the norm. [9] As Uttaro also shows here, smallholder farmers in areas close to urban centers such

as Blantyre (in southern region), Lilongwe (in central region), and Mzuzu (in northern region) also face the problem of limited land availability due to high population densities.

Collapse of the Credit System

During the 1980s Malawi was a model for providing access to credit at low interest rates for African smallholders. [10] In 1994, however, with the transition in leadership from the near dictatorship of Dr. Kamuzu Banda to the multiparty system of Dr. Bakili Muluzi, economic changes resulted in rising default rates on credit repayments. During this time, interest rates that were subsidized at ten percent became unsubsidized at thirty to fifty percent. [11]

Fertilizer subsidies were additionally phased out during the 1980s and early 1990s as part of structural adjustment reforms. The removal of these subsidies, coupled with rising world fertilizer prices, decreased the profitability of fertilizing food crops. [12] Fertilizer use has therefore dropped significantly since 1994. [13]

Decreasing Yields

Compounding these factors is the problem of consistently decreasing yields of food and cash crops in the smallholder sector, caused by diminishing soil fertility. Farmers attribute the fall in the productivity of their land to the increased cost of inorganic fertilizers. [14] Coupled with their lack of access to credit for fertilizer, smallholders have minimal opportunities to increase their yields and intensify their agricultural production, contrary to Smale's optimistic claims that Malawi during the 1990s was on the verge of experiencing a "delayed Green Revolution." [15]

Faced with a crisis of chronic food insecurity, unheard of during the Banda years, Malawian smallholders in the early 1990s sought governmental assistance through food for work programs, welfare programs, and free input programs. Food security analysts repeatedly called for "safety net" programs. [16] Safety net programs function under the assumption that sustainability of a livelihood system depends upon increasing the resilience of the most marginal and poorest quintile(s) of the population. Interestingly, however, Malawi's starter pack program, first implemented in the 1998/1999 season and repeated in 1999/2000, was targeted at all subsistence farmers and not only the most marginal. Why?

THE STARTER PACK: A TOOL FOR HOUSEHOLD FOOD SECURITY

The suggestion for the starter pack program was presented in 1998 by Charles Mann, of Harvard Institute for International Development (HIID), who stated that national food security could be best achieved by distributing hybrid seed and fertilizer to *all* Malawian farmers. [17] The objectives of the starter pack distribution in 1999/2000 were: "a) to assist in filling the food gap; b) to promote crop diversification; and c) to promote the concept of soil fertility improvement". [18] With the intention of jump-starting yields, the program distributed five kilograms of urea fertilizer, ten kilograms of 23:21:0+4s fertilizer, two kilograms of groundnuts or soybeans, and two kilograms of hybrid maize seed to smallholders.

In addition, the 1999/2000 starter pack program included a pilot project designed to distribute up to 50,000 starter packs or other household items utilizing existing private-sector

retail outlets. Selected households did not directly receive starter pack input packages, rather vouchers redeemable at local retailers. Forty-nine thousand of these vouchers were redeemable only for starter packs. The remaining 1,000 "flexi vouchers" could be redeemed for either a starter pack *or* goods valuing up to MK 450.00. [19] Subject to availability, flexi vouchers could be redeemed for soap, salt, oil, fertilizer (often limited in availability), hybrid maize seed, agricultural tools, pots and pans, blankets, lamps, or similar household items. Participating retail outlets varied between the southern, central, and northern regions. The purpose of the voucher pilot project was to "test the capability of the national retail chains to transport, store and distribute packs to recipients, and to examine the various modalities of distribution". [20] At three selected test sites, the pilot project tested the number of distributing outlets, timing of voucher distribution, and transportation of starter packs to retail outlets. The purpose of the flexi voucher was to test a third distribution method, in this case utilizing previously available goods instead of specially packaged and distributed starter packs.

RESEARCH METHODS AND OBJECTIVES

The primary purpose of this paper is to evaluate the differences in effectiveness of the starter pack, starter pack voucher, and flexi voucher as tools for improving food security among Malawian smallholder farmers. We assess whether the vouchers received by some of the farmers were more effective than the packs received by other farmers; and if so, which kind of voucher was more effective, starter pack voucher or flexi voucher.

If a particular type of starter pack input distribution method succeeds in enhancing food security within particular households during the years of distribution, it may hold potential as a safety net program. Further, if households demonstrate increases in productivity and/or discretionary cash in years *following* actual distribution of starter pack inputs, that input distribution method may also be a productivity-enhancing safety net or "PES-net." [21]

DATA COLLECTION

Detailed household information was collected from forty-seven households nationwide, who were chosen based on three criteria of geographic location, status as a recipient of starter pack inputs, and gender and marital status of the head of household. For example, 15 households were selected from the southern region, 17 from the central region, and 15 from the northern region. Households were also classified according to the type of inputs received through distribution of the 1999/2000 starter pack. Households interviewed consisted of 14 households receiving inputs in the form of an assembled starter pack; 9 households receiving a starter pack voucher; 12 households receiving a flexi-voucher; and 12 households who, although eligible, were unintentionally omitted from one of the above programs. [22] Households were also disaggregated by the gender of head of household, to understand the relationship between gender and marital status of the household head and the impact of the starter pack program. Fifteen female-headed households (FHHs), 20 men in male- headed households (MHHs), and 12 married women in male-headed households (MFs) were therefore interviewed.

DATA ANALYSIS: ETHNOGRAPHIC LINEAR PROGRAMMING

To determine the potential of the starter pack, households were simulated utilizing ethnographic linear programming. [23] Linear programs are designed to reflect the reality of the livelihood systems of each particular household, and can model considerable individual variation in resource availability and use. [24] The linear programming model, constructed in Microsoft EXCEL, includes assumptions about the labor, cash, and consumption requirements of the livelihood system, as well as the cash and labor constraints of commonly produced crops, and additional components of the livelihood system such as off-farm employment and receipt of remittances. The model evaluates options available to the individual household and predicts the land, labor, and activity allocation most optimal to maximize household discretionary cash income. Households here are modeled for a time period of seven years, first without any starter pack inputs and then after receiving inputs through each of the three distribution methods.

Once the model accurately simulates the reality of the household livelihood system, it is assumed that the model can also make accurate predictions of activity distribution upon introducing the starter pack or voucher inputs into the system. Analysis of predictions can effectively function as a tool to understand the potential benefit of vouchers versus grants of starter packs, through observation of differences in discretionary year-end cash and a household's ability to meet consumption requirements with the differential introduction of vouchers versus starter packs into the system. The models can also be used to categorize different kinds of households into "recommendation domains" according to shared characteristics. Particular household types, such as female-headed households, may benefit differently from male-headed households with a greater amount of land or more access to credit, fertilizer, or off-farm employment.

ASSUMPTIONS UTILIZED IN THE LINEAR PROGRAM

The primary activity presented to households modeled in the linear program was agricultural production. Predominant crops of local maize, hybrid maize, groundnuts, beans, and tobacco were included in the linear program. Households reporting access to a small garden plot of land (dimba) were modeled with the opportunity to plant a combination of vegetables and maize there.

Famine Early Warning System (FEWS) data provided baseline yield figures. FEWS nationwide yield figures for the 1999/2000 season were organized by Extension Planning Area (EPA), the same category used for distribution of starter pack and flexi vouchers. Average yield data for EPAs containing interviewed households were combined to create regional averages. With the use of Benson's data from the nationwide Fertilizer Verification Trials of 1995/96, these averaged yield figures were converted to reflect yields with varied amounts of fertilizer. [25]

The linear program model also included data on consumption needs of each household. Food and Agriculture Organization (FAO) consumption requirements for an adequate nutritional diet were utilized and cross-referenced with maize consumption data as reported by households during interviews. Suggested and reported maize requirements were found to be similar, indicating the validity of utilizing the FAO suggested requirements. In making this comparison, a program entitled Furnishing Essential Diets (FED) was utilized. [26] Each

household members' age, sex, and physical activity level was used in collaboration with country specific averages for individual body weights to calculate energy requirements in kilocalories. Data collected during interviews were compared with the FED suggested consumption requirements. The two sources were found to be consistent with a correlation coefficient of 0.6540 and the use of FED was continued.

Using 1.0 to represent the total household kilocalorie requirements suggested by FED, we assumed that 0.7 of caloric intake was obtained from maize, 0.055 from beans, 0.02 from groundnuts, 0.034 from vegetables, and 0.191 from purchased items such as oil. We assumed that maize consumption was obtained through the locally prepared "nsima", calculated to contain 3168 kcals/kilogram (kg) or 12% less than the total kilocalorie content found in one kg of maize, in order to account for the portion lost during processing. [27] In addition, beans were assumed to contain 3320 kcals/kg, groundnuts 5536 kcals/kg (unshelled), and vegetables 350 kcals/kgs. Consumption requirements were adjusted as household members aged over the seven-year period.

The linear program provides predictions of the optimal scenarios for each of the 47 households with the ultimate objective of maximizing household discretionary cash income at the end of the year. The program calculates the cost and income of available activities and makes predictions of labor allocation, cropland distribution, and involvement in off-farm income generating activities, predicting that households will engage in those activities generating the greatest discretionary cash income.

While simulating households through the linear program, the primary objective remains maximizing household discretionary cash while meeting consumption requirements during the seven-year time period modeled. The linear program simulates maintainable household activities, and does not provide opportunity for activities such as thieving or decreased consumption. If these activities are necessary in order to meet cash or consumption requirements, as they commonly are for Malawian smallholders, households are considered food insecure. Because of this, many households in the linear program are unable to meet the designated cash and consumption requirements.

LINEAR PROGRAM SCENARIOS

All forty-seven households are simulated according to seven different linear program scenarios, each for a period of seven years. First, households are modeled while receiving no starter pack inputs. Next, households are modeled while receiving a starter pack for only the first two of the seven years (scenario 2), then with a starter pack voucher for only the first two of the seven years (scenario 3), and then with a flexi voucher for only the first two of the seven years (scenario 4). Finally, households are modeled while receiving a starter pack for the first five of the seven years (scenario 5), a starter pack voucher for the first five of the seven years (scenario 6), and then a flexi voucher for the first five of the seven years (scenario 7).

LINEAR PROGRAM RESULTS: PREDICTIONS WITHOUT STARTER PACK INPUTS

Household simulations with the first linear program scenario are evaluated here, and reveal the inability of most households to meet cash and consumption requirements for the

seven year time period without any starter pack inputs. Results show only 14 of the 47 modeled households are able to meet cash and consumption requirements for the whole time period, implying they are the only households with "sustainable livelihood systems" over the seven-year time period. It is assumed here that households have "sustainable livelihood systems" as described in the sustainable livelihoods (SL) literature if they can satisfy cash and consumption requirements over the seven-year time period modeled. If not, if the model has an infeasible solution for at least one of the seven years modeled, this means the household cannot satisfy both cash and consumption requirements with the livelihood activities currently in the model. In this case, the livelihood system of the household is considered "unsustainable." Linear programming models are thus used here to quantify the ideas presented qualitatively in the sustainable livelihoods (SL) literature. [28]

The remaining 33 households (70%) are unable to meet full cash and consumption requirements. They are of particular interest as they represent severely food insecure households and examples of "unsustainable" livelihood systems. To determine the severity of the cash or food deficit of the remaining households, the stated cash and consumption requirements are reduced incrementally. By doing this, four groups of households are created:

Group One: Households able to meet full consumption and cash requirements,

Group Two: Households able to meet full consumption requirements and 50% of the cash requirements,

Group Three: Households able to meet 75% consumption requirements and 50% of the cash requirements,

Group Four: Households able to meet 66% consumption requirements and 50% of the cash requirements, while exhibiting negative year-end cash values, implying they are in debt. Allowing group-four households to dip into negative numbers reveals the extent of their inability to meet cash and consumption requirements and the size of their debt.

Although there may be some data inaccuracies, the need to reduce cash and consumption reflects the reality that many Malawian households do not now meet their consumption requirements through "accepted" livelihood activities, particularly in the pre-harvest season. Realities for chronically food insecure households would expectedly include begging, borrowing, or stealing.

DIFFERENCES BETWEEN THE FOUR GROUPS

Of the 47 modeled households, 17 (36%) are in group-four, representing the most impoverished households. To characterize households in group-four, this research looks for shared household characteristics by considering three possible criteria; gender of the head of household, geographic location, and available land.

A comparison of the gender characteristics in figure 1 shows that six of the 15 (40%) female-headed households interviewed are in group-four, versus 11 of the 32 (34%) male-headed households. Notably, of the total 15 female-headed households, only two (13%) are in group-one, whereas 21 male-headed households (38%) are in this group (figure 1). Results from scenario 1 thus show that more MHHs are in the richer group-one, while more FHHs are in the poorer groups, unable to provide their households with sustainable livelihoods without the starter pack.

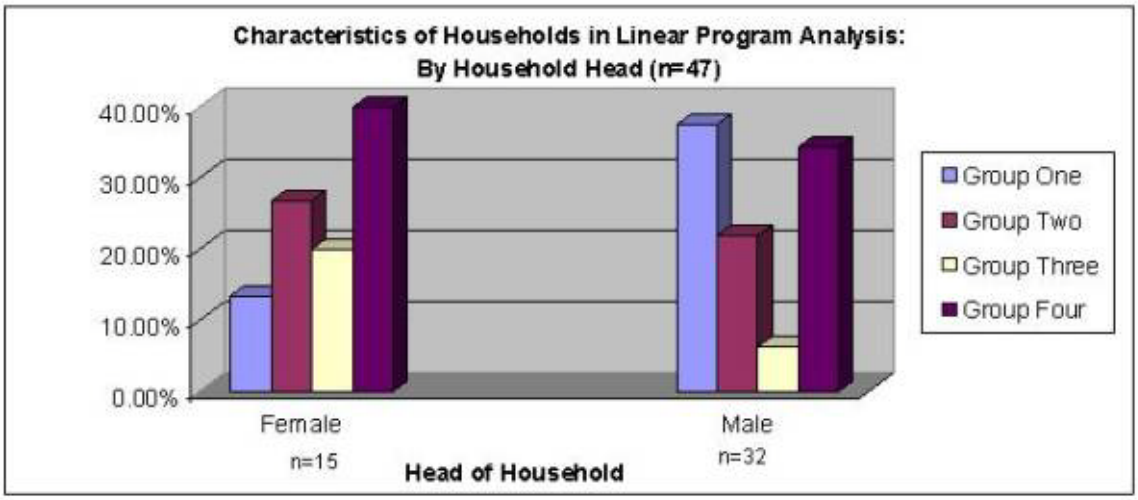

Figure 1: Characteristics of Households: By Household Head and Group

Results of evaluating geographic location in scenario 1 show that half of those in the poorest group-four come from the region of the greatest population density in Malawi, the southern region (figure 4). In contrast, the greatest proportion (41.18%) of households able to meet full requirements (group-one) live in the central region where Malawi's predominant cash crop of tobacco is produced. Households in the southern region are relatively worse off than northern households and in turn central households. In terms of available land, households in group-four have considerably less land than those in groups one through three. Only three of the 18 households in group-four have more than two acres of available land.

Potential of the Starter Pack for Household Food Security

Next, households are modeled while receiving a starter pack for only the first two of the seven years (scenario 2), then with a starter pack voucher for only the first two of the seven years (scenario 3), and then with a flexi voucher for only the first two of the seven years (scenario 4). Finally, households are modeled while receiving a starter pack for the first five of the seven years (scenario 5), a starter pack voucher for the first five of the seven years (scenario 6), and then a flexi voucher for the first five of the seven years (scenario 7). To analyze the impact of the starter pack inputs on household food security, two aspects are examined:

changes in year-end discretionary cash income earned by the household with the inputs or vouchers, and changes in maize produced by the household.

Changes in Year-End Cash Income with the Starter Pack

Overall results of introducing the starter pack via the various distribution methods (starter pack, starter pack voucher, and flexi voucher) are disappointing: a run of each model in scenarios 2-7 shows that predicted increases in a household's discretionary cash income are less than seven percent and thus not substantial (figure 2). Whether or not the household receives the input grants for two years or five years, out of a total seven years, makes little difference to these results: there is practically no increase in discretionary cash income over the control of "no starter pack." As shown by the flat graphs in figure 2, household average annual cash of sample households in Malawi's central region does not increase with starter pack inputs or vouchers.

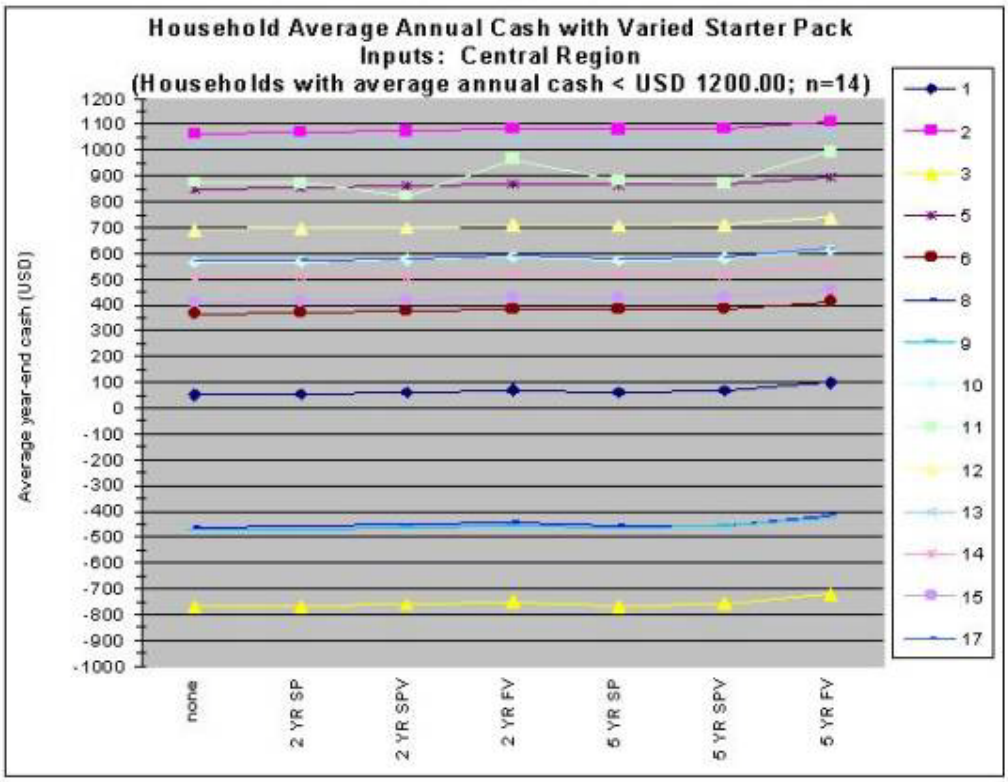

Figure 2: Average Annual Year-End Cash With Starter Pack Inputs: Central Region (Households with average annual cash < USD 1200.00)

However, the linear program predicts the greatest discretionary cash increase when households receive flexi vouchers (scenarios 4,7). Yet these results are also not encouraging for the starter pack. In all cases, the linear program predicts households redeem flexi vouchers for goods (soap, salt, etc.) rather than get a starter pack with the flexi voucher. Because the linear

program considers the retail outlet value of the flexi voucher as a direct cash contribution to the household, redemption of flexi vouchers for goods provides an immediate cash value of MK 900 and MK 2250 when receiving flexi vouchers for two and five-years, respectively.

In scenarios 3 and 6, when households are provided with a starter pack voucher, the linear program applies these inputs directly to the household resource pool if it predicts the household redeems the voucher for inputs. Households can use or sell all or some of the inputs; e.g., they can keep the hybrid maize seed, use the fertilizer, and sell the legume seed. If households do not redeem the voucher, it can be sold informally for a value reportedly less than the value of selling the starter pack. The linear program therefore assumes transaction costs when acquiring a starter pack after receipt of a voucher.

Results show that households receiving starter pack vouchers earn an average annual cash income slightly less than those households receiving flexi vouchers and slightly greater than those households receiving starter packs. In scenario 6 with households receiving starter pack vouchers for five years, the linear program in most cases predicts households sell vouchers during the first two years and redeem vouchers for starter packs during the remaining three years. Reportedly, sales of vouchers provide the household with an immediate cash value between MK100 and MK300. In these cases, the cash benefit to households occurs primarily during the first two years when vouchers are sold. In other cases, particularly in the northern region, the model predicts households redeem vouchers for starter packs in all years, resulting in annual discretionary cash averages similar to those exhibited with starter pack distribution in scenarios 2 and 5. [29]

Results show that distribution of assembled starter packs (scenarios 2, 5) demonstrates the smallest comparative increase in total year-end cash income with the grants program. Similar to scenarios 3 and 6 with receipt of a starter pack voucher, receipt of a starter pack in scenarios 2 and 5 does not consistently add cash income to the household. In some cases, the increase in household discretionary cash after receiving five years of an assembled starter pack is less than the cash increase after receiving only two years of flexi vouchers. With the two-year value of flexi vouchers equivalent to MK 900, the five-year starter pack value is then less than MK 900, or MK180 annually. Some households sell part of the pack, use only the fertilizer, and save the rest. The increase in household cash income is thus quite variable, depending on how the household utilizes the inputs and whether or not it sells, plants, trades, or saves them.

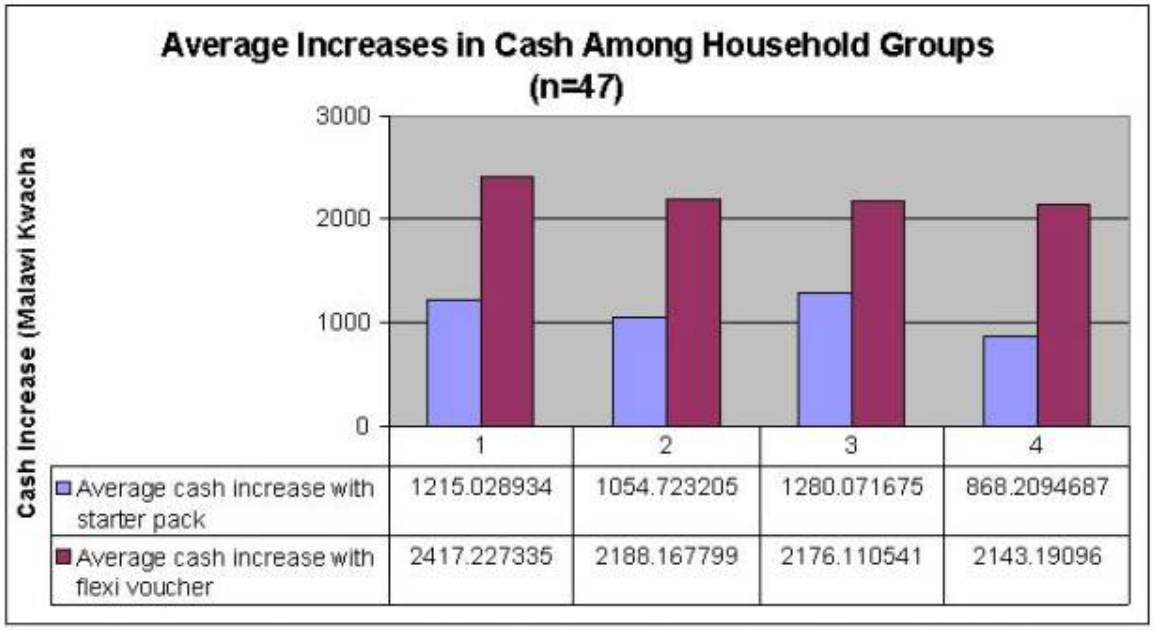

Figure 3: Average Increases in Cash Among Household Groups (n=47)

These results do not paint a rosy picture of the benefits of the starter pack program, at least in the way it was universally distributed to all smallholder farms in Malawi in 1998 and1999. Does the picture improve somewhat if we look only at the benefits accruing to the poorest group-four, the group that Gladwin's introduction to these papers claim should have been the only group targeted with a safety net program? Figures 3 and 4 show the results disaggregated by the household grouping described above, where group-one is the richest group with sustainable livelihood systems and group-four is the poorest group with unsustainable livelihood systems. The disaggregated results in figure 3 show households in group-four increase their cash incomes by less than MK 1000 with receipt of the starter pack, versus MK 2143 with the flexi voucher. Of all the groups, group-four achieves the largest percentage increase in household cash income after five years of starter pack inputs, but this is a paultry 3.47% (figure 4). This minimal increase is doubled to 6.5% with the flexi voucher. Both increases in cash income, however, are small and do not provide much support for the starter pack program in its present form.

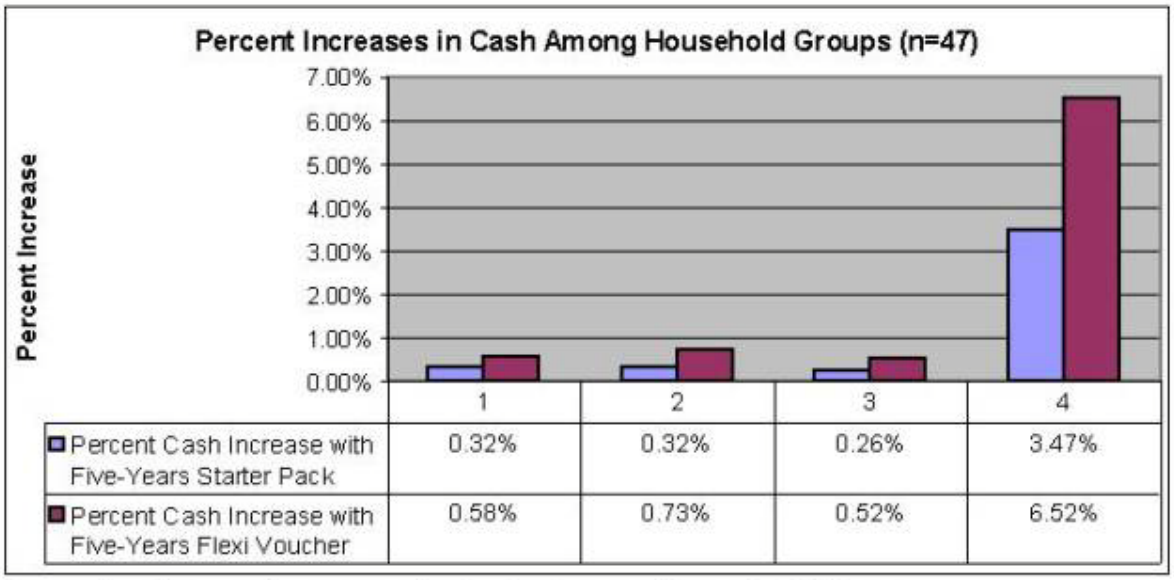

Figure 4: Percent Increases in Cash Among Household Groups

Change in Total Maize Production After Input Distribution

The potential of the starter pack program as an effective formal safety net, however, may not be reflected in its ability to increase household disposable cash income, but rather in its ability to improve household food production, both during the time period of free inputs and in subsequent years. To determine this potential, we examine the increases in household maize production over the seven-year time period, and then aggregate household maize production over the 47 households to get an estimate of aggregate maize production (for these 47 households). To compare pre- and post- starter pack maize production, a six-year analysis is compiled from a combination of scenarios 5-7 described above. The first year represents results from the linear program model without starter pack inputs, while years two through six represent results when starter pack inputs are included as activities of the linear program.

Graphs of aggregate maize production of the forty-seven households in figures 5-7 indicate that the greatest total maize production occurs when households receive starter pack inputs (figure 5), and the smallest total maize production occurs when households receive flexi vouchers (figure 7). This increase in maize production reflects increases in hybrid, not local, maize production.

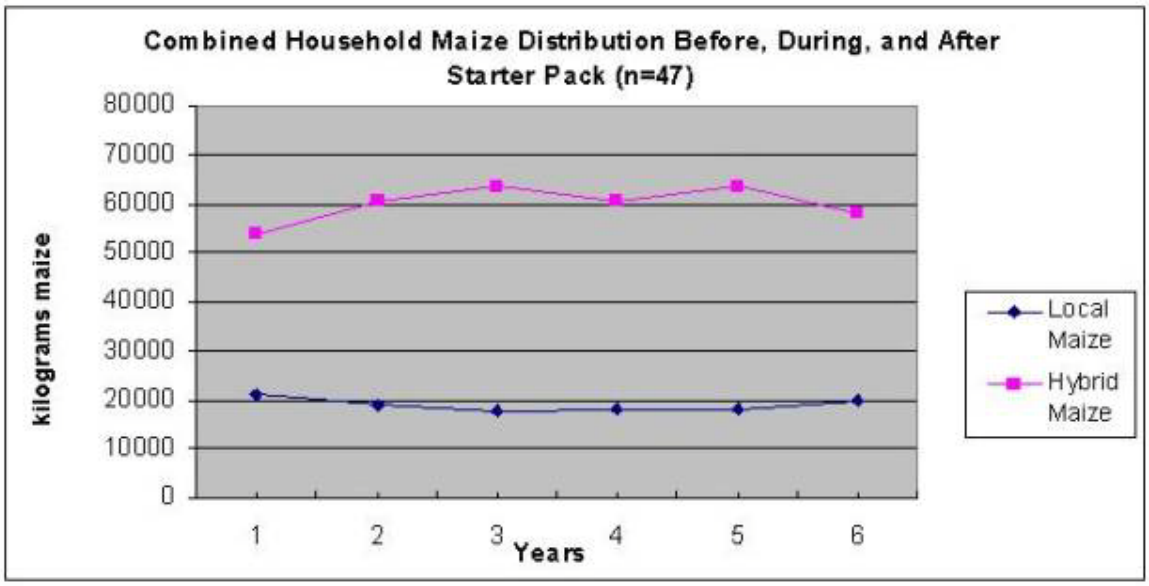

Figure 5: Combined Household Maize Distribution Before, During, and After Starter Pack (n=47)

With households receiving starter pack vouchers (figure 6), maize production does not increase in the first two years due to the predictions that households sell the vouchers for immediate cash. In later years, where predictions indicate that voucher recipients redeem vouchers for starter packs, an increase in maize production is evident. The increase, however, is less than that achieved when households receive an assembled starter pack for the five-year period (figure 5).

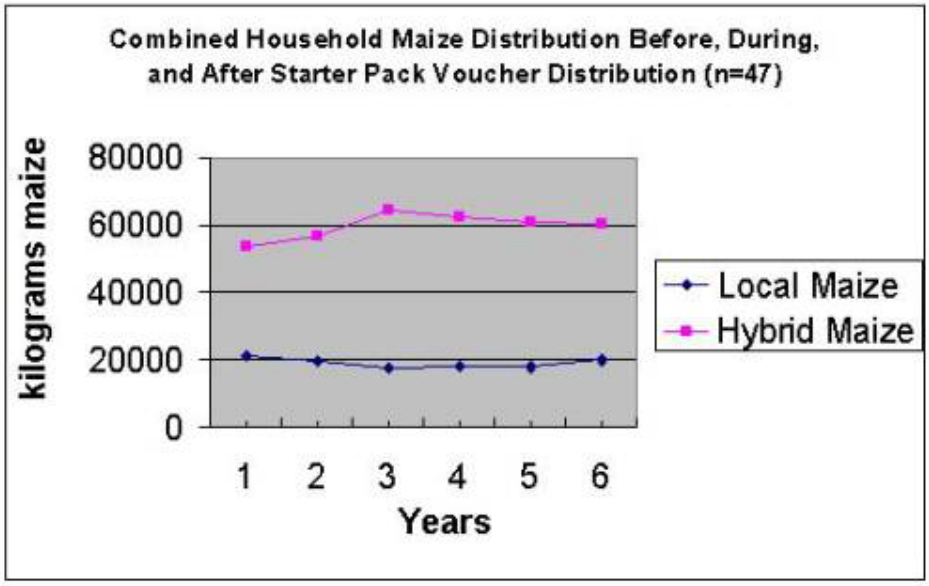

Figure 6: Combined Household Maize Distribution Before, During, and After Starter Pack Voucher Distribution (n=47)

With households receiving flexi vouchers (figure 7), the model predicts many households redeem the voucher for household goods available at retail outlets. Because the model predicts these goods are comprised of non-agricultural inputs, maize production increases minimally in this case.

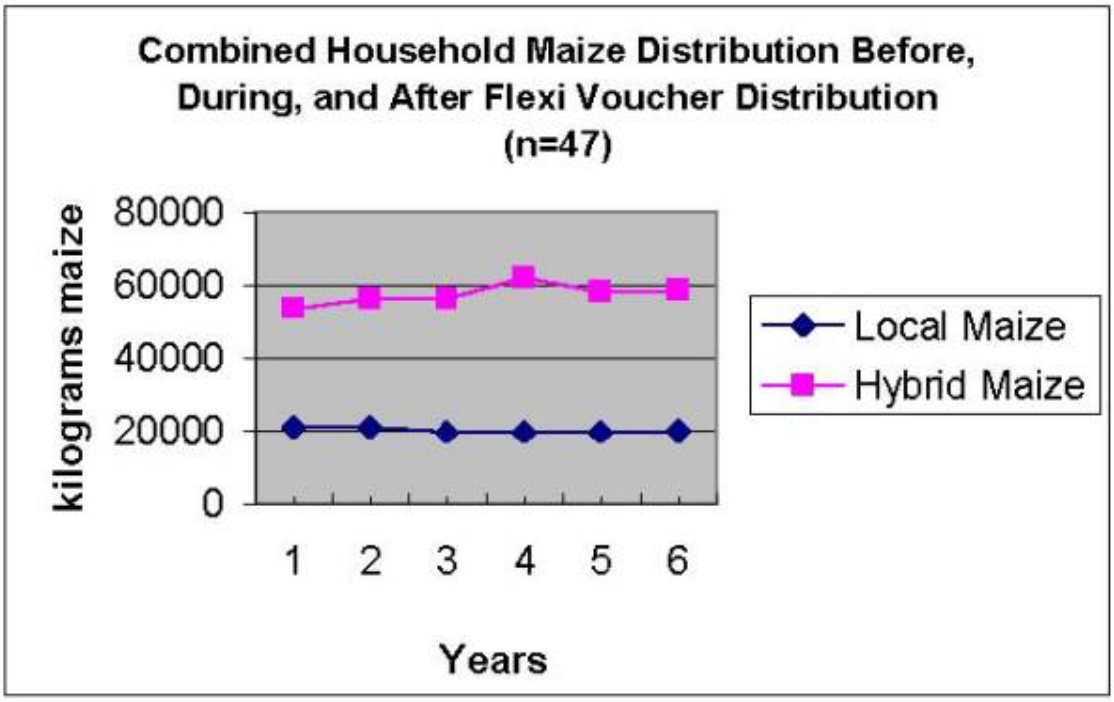

Figure 7: Combined Household Maize Distribution Before, During, and After Flexi Voucher (n=47)

DRAWING CONCLUSIONS OF THE STARTER PACK: DEFINING APPROPRIATE INPUTS

The purpose of this paper was to evaluate a test conducted by the government of Malawi in 1999/00 to distribute free inputs to smallholder farmers. With a sub-sample of selected farmers, government tested the efficacy of distributing vouchers versus assembled starter packs, to see whether the vouchers received by some of the farmers were more effective than the assembled packs received by other farmers. Using ethnographic linear programming models simulating the livelihood systems of 47 Malawi households, we examined the differential impact of the three distribution systems -- the starter pack, starter pack voucher, and flexi voucher, in order to determine which was the more effective tool for improving food security among Malawian smallholder farmers.

Results showed the most economically enhancing tool for smallholders, especially the poorest in group-four, were flexi vouchers. The benefit of distributing flexi vouchers was manifested through increased household cash income (averaging MK 2143 in group-four) and not maize production. We concluded this MK 2143 would purchase 450 kg of maize over the five-year period, enough to feed a chronically food-insecure family (with food requirements of 700 kg of maize per year) for 7.7 months spread over the five-year time period, or 1.54 months per year. [30] Unfortunately, this additional maize is probably not enough to make a chronically

food-insecure household in Malawi food-secure. It is just too little in the Malawi situation where food-insecure households now face hunger seasons of five to six months.

This discretionary cash increase is less than the value of the vouchers, MK 2250, because of the labor or cash necessary to redeem the voucher. Further, it is unlikely that households would use all the additional cash for purchasing maize for consumption. Because of the strong desire among smallholders to produce their own maize, many households would invest in agricultural inputs and some would purchase household items. If this were the case, many households might not reach the highest potential increase in discretionary cash income.

We also tried to determine if the impacts depended on particular household characteristics, including gender and marital status of the household head. We concluded that because the majority of sample female-headed households were in the poorest group-four (figure 1), they would benefit relatively more than male-headed households from receipt of starter packs or flexi vouchers.

In scenario 5 with five years of starter packs, the average discretionary cash increase for group-four was only MK 868. Again, if the increased discretionary cash income were used solely for purchasing maize for consumption, a household would be able to purchase three and a half bags of maize. This 175-kilogram increase, however, represents only thirty-eight percent of the potential increase (450-kilograms) from flexi vouchers. Yet households increased maize production more after receiving starter packs and not flexi vouchers. Adding the 200 kilogram increase in maize production exhibited by these households, the potential maize increase of households after starter pack inputs becomes roughly 375 kilograms – still less than that occurring with flexi vouchers.

RECOMMENDATIONS

The actual cash or maize production increase that households experienced after receiving five-years of starter pack or vouchers was less than 8% in all cases. Yet even a minimal increase could constitute a significant degree of improved food security for the poorest households. The starter pack program, however, may not be the most effective mechanism of providing smallholders with a safety net. If a variation of the starter pack program is to be continued as a mechanism for improving food security for the poorest of the poor in Malawi, suggestions for defining appropriate inputs include:

a) Distribution of flexi vouchers or a similar tool allowing for household selection of goods;

b) Enhanced cooperation from retail outlets in order to increase smallholders' access to inorganic fertilizer;

c) Utilization of local retail outlet goods for distribution instead of distribution of prepackaged inputs in order to increase availability of desired goods (e.g., fertilizer) at retail outlets.

In conclusion, the starter pack distribution increased household discretionary cash and maize production minimally. Most households exhibited minimal increases in discretionary cash or total maize production after receiving inputs for even a five-year duration. Considering the massive cost of the program and the extensive amounts of planning, labor, and cooperation required, we recommend reducing the target population to group-four (and group-three if

funds are available) and distributing inputs in a manner similar to that of flexi vouchers. Providing the option to obtain either agricultural inputs or goods with immediate cash value allows for the greatest potential increase in household cash income. Assigning inputs appropriate to the needs of the targeted households can potentially reduce misuse of inputs (i.e. selling or trading) and simplify the input distribution. While these changes might result in minimal improvements in food security, they do represent the comparatively greatest increase available from starter pack inputs included in the 1999/2000 distribution. Utilization of flexi vouchers holds potential benefit as a productivity-enhancing tool if redemption procedures allow smallholders – culturally, economically, and in a timely manner – access to those resources deemed beneficial to improving food security.

Notes

1. Sahn & Arulpragasam, 1991; Gladwin et al. 2001; Uttaro in this special edition.
2. Malawi's Ministry of Agriculture and Irrigation (MoAI), July 2000.
3. Lele 1999; Gladwin et al., 2001.
4. Lele 1999; Gladwin et al. 1997; Gladwin et al. 2001.
5. Food and Agricultural Organization (FAO).
6. Thomson and Metz, 1997.
7. Kumwenda et al. 1996.
8. Devereux 1999.
9. Kumwenda et al. 1996.
10. Gladwin 1991, 1992.
11. ibid
12. Sahn & Arulpragasam, 1991.
13. Benson 1997.
14. Benson, 1999.
15. Smale 1995.
16. Mann, 1998; Devereux 1999; Gladwin et al. 1999.
17. Mann, 1998.
18. Clark, 2000. page ii.
19. Longley et al. 1999. During the time of voucher redemption, MK 450.00 was equivalent to approximately US $ 9.00.
20. Killick, 2000. page 1-2.
21. Devereux, 1999; Gladwin et al. 1999; Gladwin et al. 2001.
22. Either because the smallholder population in Malawi is perhaps greater than 2.86 million, or because some households received more than one input package, a number of households received no starter pack inputs although they were eligible for input receipt.
23. Hildebrand et al. 2002.
24. Hildebrand & Poey 1985.
25. Benson 1999.
26. Hiebsch, 2000.
27. Ranhotra, 1985; from Penderson, 1989.

28. Conway and Chambers 1992; Scoones 1998.
29. Minimal differences between starter pack and starter pack voucher annual discretionary cash averages were due specifically to differences in labor requirements for traveling to redeem vouchers. In many cases, vouchers required more time due to the need to both obtain the voucher and travel to the retail outlet to redeem the voucher. However, the organization of local distributors and transport equipment created much variation in the amount of time required to obtain goods through any method of distribution.
30. Gladwin et al. 2001: Table 1, p. 182.

References

Benson, T. "The 1995/96 Fertilizer Verification Trial - Malawi." Report by Action Group I, Maize Productivity Task Force, Ministry of Agriculture and Livestock Development, Government of Malawi, Lilongwe, Malawi, 1997.

Benson, T. "Area Specific Fertilizer Recommendations for Hybrid Maize Grown by Malawian Smallholders: A Manual for Agricultural Extension Personnel." Report by Action Group I, Maize Productivity Task Force. Lilongwe, Malawi: Author, 1999.

Chambers, R., Conway, G. "Sustainable Rural Livelihoods: Practical Concepts for the Twenty-First Century." IDS Discussion Paper 296, Brighton: Institute for Development Studies, University of Sussex, 1992.

Clark, C. "Final Report: Implementation of Starter Pack Scheme." Malawi Starter Pack Logistic Unit: Author, February, 1999, page ii.

Devereux, S. "Making Less Last Longer." IDS Discussion Paper 373. Brighton, UK: Institute of Development Studies, University of Sussex, 1999.

Food and Agriculture Organization [FAO]. "Women Feed the World." Prepared for World Food Day, October 16, 1998. Rome: FAO Available: www.FAO.org December 15, 2001.

Gladwin, C.H. "Fertilizer Subsidy Removal Programs and Their Potential Impacts on Women Farmers in Malawi and Cameroon," In: Gladwin, C.H., ed. Structural Adjustment and African Women Farmers. Gainesville, FL: University of Florida Press, pp. 191-216, 1991.

Gladwin, C.H. "Gendered Impacts of Fertilizer Subsidy Removal Programs in Malawi and Cameroon." Agricultural Economics 7 (1992): 141-153.

Gladwin, C.H., Buhr, K., Goldman, A., Hiebsch, C., Hildebrand, P., Kidder, G., Langham, M., Lee, D., Nkedi-Kiza, P., Williams, D. "Gender and Soil Fertility in Africa." Replenishing Soil Fertility in Africa, R. Vuresh and P. Sanchez, eds. SSSA Special Publication 51. Madison, WI: Soil science society of America (SSSA), 1997.

Gladwin, C.H., Thomson, A.M., Peterson, J.S., Anderson, A.S. "Addressing Food Security in Africa via Multiple Livelihood Strategies of Women Farmers." Food Policy 26 (2001): 177-207.

Gladwin, C.H., Uttaro, R. & Anderson, A.S. "Adaptive Strategies in Malawi." University of Florida: Author, 1999.

Hiebsch, C. "Furnishing Essential Diets (FED)." Unpublished database of: Energy and Protein Requirements: Report of a joint FAO/WHO/UNO expert consultation. WHO Technical Report Series 724. Geneva: Author, 2000.

Hildebrand, P.E. "Ethnographic Linear Programming." Gainesville, FL: Author, 2002.

Hildebrand, P. & Poey, F. On-farm Agronomic Trials in Farming Systems Research and Extension. Boulder, CO: Lynne Rienner Publishers Inc., 1985.

Hildebrand, P. & Waugh, R. "Farming Systems Research and Development." In P.E. Hildebrand (ed.), Perspectives on farming systems research and extension. Boulder, CO: Lynne Reinner Publishers Inc., 1986.

Killick, P. "Malawi Government Starter Pack Scheme 1999: Report on the Pilot Voucher Scheme." Starter Pack Logistics Unit. Malawi: Author, 2000, page 1-2.

Kumwenda, J.D.T., Waddington, S.R., Snapp, S. S., Jones, R.B., Blackie, M.J. "Soil Fertility Management Research for the Maize Cropping Systems of Smallholders in Southern Africa: A Review. Natural Resources Group Paper 96-2. Mexico City, Mexico: Centro Internacional para la Mejoramiento de Maiz Y Trigo, 1996.

Lele, U. "Structural Adjustment, Agricultural Development and the Poor: Some Lessons from the Malawian Experience. World Development 18 (1990): 1207-1219.

Lele, U., Christiansen, R.E., Kadiresan, K. "Fertilizer Policy in Africa: Lessons from Development Programs and Adjustment Lending, 1970-87." Managing Agricultural Development in Africa discussion paper 5. Washington, D.C.: World Bank, 1989.

Longley, C., Coulter, J., Thompson, R. "Malawi Rural Livelihoods Starter Pack Scheme, 1998-99: Evaluation Report." London: Overseas Development Institute, 1999.

Mann, C. "Higher Yields for All Smallholders; the Surest Way to Restart Economic Growth in Malawi." Cambridge, MA: Harvard Institute for International Development, 1998.

Ranhotra, 1985, from Penderson, B., Knudsen, K., & Eggum, B. "Nutritional Value of Cereal Products with Emphasis on the Effect of Milling." In G. Bourne (ed), World review of nutrition and dietetics, V 60: Nutritional value of cereal products, beans and starches. St George's University School of Medicine, Grenada, West Indies: Karger, 1989, pp 22-37.

Sahn, D., & Arulpragasam, J. "The Stagnation of Smallholder Agriculture in Malawi: A Decade of Structural Adjustment Period." Food policy, June, 1991 16(3), June: Author.

Scoones, I. "Sustainable Rural Livelihoods: A Framework for Analysis." IDS Discussion Paper 72. Brighton, UK: Institute of Development Studies, University of Sussex, 1999.

Smale, M. "Maize is Life: Malawi's Delayed Green Revolution." World Development 23 (1995): 819-831.

Thomson & Metz, (1997). Implications of economic policy for food security. A training manual. Rome: Food and Agriculture Organization of the United Nations.

Reference Style: The following is the suggested format for referencing this article: Gough, Amy E. , Christina H. Gladwin, and Peter E. Hildebrand. "Vouchers Versus Grants of Inputs: Evidence From Malawi's Starter Pack Program." African Studies Quarterly 6, no.1: [online] URL: http://web.africa.ufl.edu/asq/v6/v6i1a8.htm