

Full Length Research Paper

Seed aid for food security? some lessons from Zimbabwe's agricultural recovery programme

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Does agricultural input aid always lead to favourable food security outcomes? This paper describes Zimbabwe's agricultural recovery program for the 2003/2004 farming season and draws some lessons that can be used in the designing and implementation of future programs. Input aid was found to be most beneficial if it is packaged together with other backup services such as training in soil fertility and water management, development of lucrative markets, and provision of basic infrastructure. Complementarity among the components of the input package itself was also found to affect the productivity of the inputs. Poor targeting of inputs both to areas and to farmers was found to affect the effectiveness of input aid in promoting food security. The study concluded that donor organisations should work closely with the recipient communities in the design and implementation of input aid programs.

Key words: Seed aid, Drought, Non-Governmental Organizations, Poor Communities.

INTRODUCTION

Zimbabwe suffers severe droughts after every two to three years. In intervening years, floods periodically affect parts of the country. As a result, the country frequently hosts drought or flood relief programs targeting the recovery of agriculture in the smallholder sector. The most common programs, involving the distribution of seed and fertilizer, have been implemented in one or another part of the country during at least ten of the 24 years since the country achieved its independence in 1980 (Rohbach, 2002).

The most recent periods of severe countrywide drought in Zimbabwe have been the 2001/02 and the 2002/03 cropping seasons. The impact of these recent droughts was measurably worsened by a rise in unemployment, high rates of inflation, a decline in gross domestic product, and an estimated 26 percent rate of HIV/AIDS incidence among adults (CIAT, 2004). Further, maize import and price controls contributed to severe shortages of grain on both urban and rural markets. In past years, farm households have responded to drought by increasing their food purchases. In 2003, it was periodically diffi-

cult to find grain for purchase. Consequently, households were assumed to be more likely than usual to consume their limited seed stocks, creating acute seed deficits (Rusike and Eicher, 1997)

Non-Governmental Organizations (NGOs) and the Zimbabwean government have responded to the post drought shortage of seed and other agricultural inputs by donating the inputs in various ways. Despite the frequency of agricultural relief programs, little is known about their efficacy. According to Sperling (1997), Seed distribution is assumed to contribute to an expansion of cropped area. But it is difficult to find independent data measuring such gains. Fertilizer is assumed to increase production levels and productivity. But most relief programs simply assume these gains. Nonetheless, each year drought re-occurs, these programs are simply started afresh (Wobil, 1998). This paper intends to address the of issues agricultural input aid effectiveness and to look at the farm level impact of input aid on agricultural productivity. The paper also assesses the possible backup services that should be packaged together with agricultural input aid to make it more beneficial to the recipients.

The paper generally addresses the following issues about agricultural input aid in Zimbabwe:

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Table 1. Number of respondents per district.

| District | Frequency | Percent |
|-------------|-----------|---------|
| Beit bridge | 437 | 6.7 |
| Bubi | 450 | 6.9 |
| Plumtree | 626 | 9.6 |
| Chipinge | 366 | 5.6 |
| Chiredzi | 1548 | 23.9 |
| Insiza | 524 | 8.1 |
| Gwanda | 523 | 8.0 |
| Matobo | 493 | 7.6 |
| Mutoko | 1520 | 23.4 |
| Total | 6490 | 100.0 |

- Household targeting – how effective is the targeting criteria used in reaching the needy – who should be targeted? Is it the poor without the resources (land, labour, draft power, capital etc) who might not have the ability to put the input to the rightful use or is it the better off who have enough resources and therefore have the ability to put the inputs to rightful use but who can also do without donations?
- Input targeting - input type and variety versus type and location of farmer – suitability of seed donated in terms of crop type and variety and of fertilizer type versus agro-ecological location of farmer.
- The provision and suitability of backup services such as agricultural training in soil and water management in arid areas and crop husbandry, or provision of other production boosting inputs - impact of these on crop yield. Do the components of the input package complement each other?
- Were the inputs put to the right use? Some people planted seed, some sold inputs, some cleaned and ate the seed, some donated while others just kept it either for the next season due to current year droughts or simply because they had nothing to do with the inputs. What proportion of the inputs was put to their rightful use?
- Issues of sustainability – what were the impacts of input donations on sustainability of agricultural production and input markets – issues of crowding out of rural retailers – what is the best way of administering aid to rural households. Will farmers be able to be self-sustainable after the donors have gone?

METHODOLOGY

Data used in this paper were collected using a variety of methods. Some of these methods were formal and structured while others were informal, exploratory or even accidental. The major data collection tools used were however key informant interviews with NGOs, farmer representatives, extension staff, rural agro-dealers and local political leaders. The key informant interviews were followed by focus group discussions with groups of farmers represent-

ing both beneficiaries and non – beneficiaries of the input aid scheme. A questionnaire was then drafted to elicit individual information from the beneficiaries of the scheme. Farmers for the questionnaire survey were drawn from 9 purposively selected districts of the country. From each of these districts and from lists of beneficiaries that were provided by NGOs working in the area, simple random sampling was used to select individual household for inclusion in the sample. A total of 6490 questionnaires entered data analysis. Table 1 shows the breakdown of the questionnaires by district.

The data were analysed mainly using descriptive statistics and also using analysis of variance in the Special Package for Social Sciences (SPSS).

RESULTS AND DISCUSSION

Input aid targeting

Different criteria can be used to target households for agricultural input aid. The major one is based on the wealth status of the household. Inputs can be targeted at the well off households that normally have other complimentary inputs and infrastructure to effectively put the donated inputs to use but these households may also not be in need of the donated inputs for they can afford to buy the inputs from the market (if available). Inputs can also be donated to the needy resource poor farmers, who, although they really need the inputs due to their inability to purchase the inputs from the market, may be too poor to put the inputs to efficient use. These households for example, may not have draught power and other tillage implements and in the case of HIV/AIDS affected households may not even have enough farming labour. Table 2 shows the input aid distribution per farmer category in the study area.

In Table 3, the percentage of household status per district is shown for the beneficiaries of the input aid scheme. In Beitbridge and Plumtree, the greatest proportion of beneficiaries was the elderly and the widows. The attention given to widows is however almost the same across all districts. Child headed households and the terminally ill are receiving very little attention. This is probably because of poor representation.

The category “other” represents those households that received input aid but did not fit into any of the poverty criteria initially set by the NGOs. This category thus represents the relatively well off households and constitutes a significant proportion of the total households that benefited from the input donations. The reasons for this result are varied. In some communities, local leaders argued that inputs were wasted if provided to the poorest of the poor. They claimed that inputs should be provided to better households capable of increasing the total quantity of food harvested in the village. These better-endowed households would then assist poorer households. One NGO did provide a small subset of inputs to these relatively wealthier households. But this practice was not common. Several NGOs provided assistance to households with whom they had previously worked re-

Table 2. District by household head status cross-tabulation.

| | Widow/ Widower | Child headed | Terminally ill | Elderly | Other* | Married Male | Female headed | Divorced | Single, never married | Total |
|-------------|-------------------|-----------------|-------------------|---------|--------|-----------------|------------------|----------|--------------------------|-------|
| Beit bridge | 27.0 | 1.0 | 1.4 | 40.5 | 16.9 | 12.2 | | | 1.0 | 100 |
| Bubi | 24.2 | 2.6 | 1.5 | 24.5 | 36.2 | 9.9 | | 0.5 | 0.5 | 100 |
| Plumtree | 27.1 | 3.0 | 1.9 | 34.6 | 16.0 | 11.8 | 1.7 | | | 100 |
| Chipinge | 14.9 | 1.1 | 0.9 | 30.2 | 13.8 | 39.1 | | | | 100 |
| Chiredzi | 20.9 | 6.5 | 2.9 | 18.3 | 29.6 | 13.8 | 7.7 | 0.2 | | 100 |
| Insiza | 19.6 | 8.0 | 0.9 | 11.0 | 60.2 | 0.3 | | | | 100 |
| Gwanda | 21.0 | 6.3 | 2.4 | 16.9 | 42.1 | 9.3 | 1.0 | 0.6 | 0.4 | 100 |
| Matobo | 20.1 | 3.3 | | 16.8 | 13.0 | 43.9 | 0.3 | 2.3 | 0.5 | 100 |
| Mutoko | 26.5 | 6.8 | 1.5 | 16.2 | 46.0 | 2.7 | 0.2 | 0.1 | | 100 |

• *Other includes those households that are well off as well as households that did not fit the poverty targeting criteria.

Table 3. Uses of donated maize and sorghum seed per district (Kg).

| | Maize | | | | | | Sorghum | | | | | |
|------------|-------|-------|-----|-----|------|------|---------|-------|-----|-----|------|------|
| | Rec. | Plant | Ret | Eat | Sold | Give | Rec. | Plant | Ret | Eat | Sold | Give |
| Beitbridge | | | | | | | 30 | 5.3 | 7.3 | | 14.0 | 3.4 |
| Bubi | | | | | | | 20 | 6.7 | 4.8 | 5.5 | | 4.3 |
| Plumtree | 4 | | | 1.9 | 1.6 | | 30 | 6.4 | 6.7 | 7.7 | 4.5 | 2.1 |
| Chipinge | 20 | 8.4 | 8.0 | | | 5.2 | 20 | 6.7 | 8.6 | | | 4.2 |
| Chiredzi | 10 | 10.6 | | | | | 25 | 8.5 | 4.9 | 6.0 | | 4.2 |
| Insiza | 4 | | | 1.9 | 1.9 | | 20 | 5.5 | 4.7 | 2.2 | 6.0 | 2.1 |
| Gwanda | | | | | | | 15 | 4.6 | 7.0 | 2.1 | | 2.0 |
| Matobo | | | | | | | 15 | 5.0 | 7.7 | | | 2.4 |
| Mutoko | 15 | 8.5 | 5.9 | | | 4.6 | | | | | | |

Rec = Seed quantity received per household; Plant = Quantity of seed planted; Ret = quantity of seed retained for next season; Eat = Quantity of seed eaten; Sold = quantity of seed sold; and Give = Quantity of seed given away. Failure to add up to the Rec. column is due to rounding off.

ardless of their socio-economic status. More broadly focused agricultural development programs were supplemented, or temporarily replaced, with the distribution of free seed and fertilizer.

Another explanation is that NGO staff concentrated more on the logistics of distributing food aid and inputs, than on the selection of needy households. Many of these staff had to be newly trained. Most were working in areas of the country where they were not familiar. As a result, the strength of linkages with some local communities was limited.

Further, NGO field staff complained about the difficulties encountered in implementing complicated targeting schemes. Farmers and village leaders expressed unhappiness about the need for multiple meetings simply to identify and verify which households should receive assistance – for example; a meeting to announce the program, a meeting to review criteria for the selection of targeted households and collect lists of qualifying households, and a meeting to verify the lists of qualifying households.

Distribution of relief Seed

The seed packages provided by different NGOs varied depending on the resources available for seed purchase and distribution, the quantities of seed available in the market, and the interest of the NGO in promoting the production of one crop or another. Most NGOs sought to provide enough seed to plant at least one acre of food crops. Though in some cases seed packages were divided into smaller units during the process of distribution in order to serve more households. Most seed packs included maize seed, because this is the main national staple. However, some NGOs sought to promote the distribution of sorghum and pearl millet instead of maize, because these are more drought tolerant crops. Most NGOs also sought to include a legume in their package. But shortages of legume seed, and the high cost of these seeds, limited the quantities of groundnut and cowpea distributed. At least one NGO also distributed sugar bean. Ultimately, all recipients received seed of at least one type of cereal grain, and the majority

Table 4. Associations between crop yield (Kg/acre) and conservation tillage method practiced.

| | Maize Yield | Sorghum Yield | Cowpea Yield | Groundnut Yield |
|-------------------------|-------------|---------------|--------------|-----------------|
| Contour ridges | 279.21 | 193.88 | 74.83 | 110.71 |
| Dead level contours | 292.04 | 326.62 | 85.70 | 105.00 |
| Infiltration pits | 181.42 | 516.29 | 85.64 | |
| Tied ridges | 296.19 | 349.50 | 84.77 | 170.21 |
| Pot holes | 244.00 | 131.66 | 67.33 | 102.50 |
| Zero tillage | 331.66 | 349.84 | 94.12 | 167.29 |
| Conventional tillage | 132.28 | 95.82 | 60.24 | 20.00 |
| Winter ploughing | 211.85 | 176.47 | 72.45 | 138.85 |
| Mulching | | 75.00 | 38.66 | |
| Ploughing across slopes | 336.00 | 103.51 | 79.00 | |
| Furrow dunes | | 88.00 | 15.77 | |
| Overall | 273.10 | 255.94 | 79.21 | 138.25 |

Table 5. Chi-Square Tests

| | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|---------|----|-----------------------|
| Pearson Chi-Square | 173.734 | 50 | .001 |
| Likelihood Ratio | 165.691 | 50 | .001 |
| Linear-by-Linear Association | 3.678 | 1 | .055 |
| N of Valid Cases | 1612 | | |

received seed of two different grain crops – most commonly both maize and either sorghum or pearl millet.

The utilization of donated inputs

- The aim of the agricultural recovery programmes administered by NGOs is to provide inputs to farmers so as to restore their productive capacity after a disaster such as a draught. However, not all households that benefit from the recovery programmes put the inputs to the use desired by the NGOs. Tables 3 shows the use to which donated maize and sorghum seed was put per district.

The targeting of seed type by district was guided by rainfall. Low rainfall areas such as Matobo, Rwanda, Bubs and Beitbridge did not receive maize because maize does not do well in these areas. Sorghum however was donated to all but the wettest district (Mutoko) because people in the district are not used to growing sorghum. Plumtree and Insiza received 4 Kg of maize seed per farmer each despite their being arid districts. However, all the seed was not planted. This reflects a flaw in area targeting.

In order to increase the benefits of donated seed to farming households, the input aid was complemented by training in various soil and water management technologies. All the farmers who received the seed were exposed to a number of soil and water management

technologies and they had to choose the one they liked most. This study made a follow up on whether adopting one or the other of these technologies makes a difference to crop yield. This information is important as a way of recommending the best soil and water back up training that NGOs should provide for each crop seed type they donate in the districts under study. Table 4 shows the results of this analysis.

Table 4 shows that ploughing across slopes, zero tillage and tied ridges are the conservation technologies best suited to maize. It can be recommended that each time maize seed is donated to households, the aid package should be accompanied by training the recipients on these technologies. Infiltration pits, tied ridges and zero tillage were found to perform well with cowpeas while zero tillage, dead level contours and infiltration pits can safely be recommended for cowpea producers. It is also worth noting that zero tillage and tied ridges generally produced the best crop yields across all crops while conventional tillage, mulching and furrow dunes produced the worst results. Investing resources into these low rewarding technologies is not advisable (Table 5).

Conclusions

This report has looked at issues related to agricultural input aid packaging and targeting. Targeting involves the choice of households that benefit from the aid. Packaging

entails the input type and combinations and other back up and support services that help increase the productivity of the donated inputs.

Most beneficiaries of the program especially in Matebeleland province were women, which is consistent with the fact that women are the prime participants in Zimbabwe's rural agriculture. A very small proportion of beneficiaries from the Agricultural recovery program was constituted by child headed households and the terminally ill. There might be need to focus on these in future programs.

A significant number of farmers especially in the arid Matebeleland region either did not plant their seed or they planted and it was affected by drought. This suggests a need to couple seed donation with training in water harvesting techniques or provision of irrigation facilities. Whether or not farmer used conservation tillage practices significantly affects the yield and condition of all the crops donated. This effect however varies between crops and across conservation tillage methods, that is, different conservation tillage methods are suitable for different crops. This implies that it may be necessary to collaborate with technology generating organizations to find out which tillage method is suitable for which region and for what crops and crop varieties.

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