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Abstract: In response to food security and nutrition problems, several governmental and non-governmental organizations have implemented various programmes to assist the vulnerable groups in Malawi. This paper evaluates the impact of household food security and nutrition intervention programmes implemented by two government departments and four non-governmental organizations. The main interventions were in the form of supplementary feeding programmes, food for work, seed multiplication, input and cash credit with varying degrees of integration. We use anthropometry and other simple impact indicators such as crop diversification, technology adoption, frequency of meals, and food security and health education to evaluate the effectiveness of food security and nutrition interventions in Malawi. We find that most projects had positive impact on the nutritional status of children, technology adoption and crop diversification.

1. Introduction

Many governments and non-governmental organizations (NGOs) in developing countries intervene in food production and accessibility through household food security and nutrition programmes. Factors that lead to such interventions include disruptions in food production and marketing systems due to natural disasters such as drought, storms and pests or from man-made problems such as wars or a combination of these factors (Muehlhoff and Herens, 1997). Besides these factors, economic reform programmes through structural adjustment programs (SAPs) sponsored by World Bank and International Monetary Fund in many developing countries create immense problems of accessibility to adequate food for the poor households. For instance, policies such as liberalisation of food marketing systems, removal of subsidies on farm inputs and food crops, currency devaluations (which generate inflationary pressures) may lead to household food insecurity and therefore contribute to high rates of malnutrition.

The policy emphasis in Malawi since independence in 1964 has been production of adequate food. Despite this policy stance most households are not able to produce adequate food to feed their families. A series of droughts and structural adjustment policies has exacerbated the food problem in Malawi. Chirwa (1998) observes that in 1995 the estimated maize requirement was 1.8 million tons but only produced 1.3 million tons of maize and 1.7 million tons of all food crops. The 1992 drought also led to a drop in domestic food supply from 2 million tons to less than one million tons. Similarly, domestic food supply fell nearly from 2.5 million tons in 1994 to 1.2 million tons in 1995 due to drought. Such instability in food security has direct implications for the nutritional

status of households. Malawi continues to experience high malnutrition levels among her under-five year old children. Recent national figures show that the rate of stunting stood at 48 percent in 1995, wasting increased from 5.4 percent in 1992 to 7 percent in 1995 and underweight reached 29.9 percent of children in 1995 (Malawi Government and UNIMA, 1996). It is in response to these problems that several governmental and non-government organisations in Malawi intervene in food production and accessibility through various forms of food security and nutrition programmes.

This paper reports on the impact of the household food security and nutrition intervention programmes on the target population based on an evaluation of programmes implemented by six organizations in Malawi. The next section briefly reviews the link between food security and nutrition. Section 3, describes the food security and nutrition intervention programmes in Malawi and the methodology used in the evaluation. In section 4, we assess the impact of the interventions using anthropometry and other simple indicators. Section 5, focuses on the major problems and constraints experienced in the various interventions in Malawi. Finally, section 6 offers concluding remarks.

2. Food Security and Nutrition: A Theoretical Framework

The link between nutrition status of households and food security is articulated in a cause and effect relationship (Mebrahtu et al., 1995). Within this causal relationship agricultural changes may affect food consumption and nutrition through six major pathways:

- incomes of households with at-risk members (level, fluctuations, sources and control) which in turn affects child care, food preparation, and in the long-run, sanitation, access to water and use of primary health care;
- food prices (absolute, relative, and fluctuations);
- time allocation, especially of women which in turn influences child care, food preparation, and energy nutrient expenditures;
- energy and nutrient expenditures;
- exposure to diseases caused by changes in sanitation, access to water, and living conditions associated with input use, technical change and other rural projects, and
- changes in nutrient composition of individual foods.

These linkages show that the physical well-being of people is thus dependent upon the availability of food supplies, which in turn depend on local farming and economic conditions and the handling of the distribution of foods (FAO, 1976). Sharma (1992) asserts that household food security is determined by both physical access to food and adequate purchasing power. While access to adequate food at the household level is needed to satisfy nutrition levels for all members of the household, nutrition security also depends on non-food factors such as satisfactory health and hygiene conditions and social practices. Therefore, household food security is one but not the only necessary condition for achieving the overall nutritional well-being of individuals.

The literature also suggests that weaknesses in economic fundamentals such as the structure of the economy, the availability and control of resources, population growth and the institutional structures are critical in influencing underlying causes of malnutrition in many developing countries (Malawi Government, 1990; Gillespie et al., 1996). The economic and institutional weaknesses that influence the main determinants of malnutrition include inadequate access to food, inadequate care for mothers and children, and insufficient health services and unhealthy environments. In addition, these underlying causes lead to interrelated immediate causes of inadequate dietary intake and diseases.

The growing food insecurity and the incidence of malnutrition prompt interventions by government and non-governmental organizations that aim at improving food security and nutrition status of children in developing countries. Arnauld (1992) notes that non-governmental organizations take a leading role with their ability to reach the least privileged groups; the right technical approach; the ability to involve the community; and relations with other parties working in the field. The interventions in food security and nutrition range from general economic policies that enhance food production and promote access to foods markets to specific vulnerable groups targeted interventions. Examples of general economic policies include subsidies on agricultural inputs, promotion of high yielding varieties of staple foods, grain pricing and marketing policies, changes in land tenure, access to inputs and access to cheap credit facilities (Bengoa and Rueda-Williamson, 1976; Malawi Government, 1990; Scandizzo and Tsakok, 1985).

Gillespie et al. (1996) identify six components of nutrition programmes that were implemented in 15 countries: nutrition education, health-related services, supplementary feeding, growth monitoring, micronutrient supplementation and home gardens. The nutrition education component is the most popular component in nutrition programmes, followed by supplementary feeding. Overall, the evaluation of the various interventions shows that small scale interventions have had positive impact on the nutrition status of children (Gillespie et al., 1996; Pinstrup-Andersen et al., 1995).

Kennedy and Knudsen (1985) argue that supplementary feeding programmes are the most common form of nutrition intervention in developing countries. Typically, these programmes distribute foods through non-commercial channels to pregnant and lactating women, infants and pre-school children. Despite the popularity of supplementary feeding programmes, their effectiveness in improving the nutritional status of targeted groups is ambiguous. The main problem is that the success of supplementary feeding programmes is related to many factors such as amount, duration, and timing of food, the initial nutritional and health status of programme participants, the degree of targeting, the degree of supervision and the availability of other services (Kennedy and Knudsen, 1985; Gillespie et al., 1996). Other success factors include the degree of community mobilisation and participation, community-based monitoring, community ownership of programmes and good management of programmes. Gillespie et al. (1996) points out that the extent of genuine community involvement is a key feature of those programmes that work satisfactory.

3. Food Security and Nutrition Intervention Programmes in Malawi

Several government and non-governmental organizations implement projects in the areas of food security and nutrition in Malawi. However, we evaluated institutions that had programmes for a longer period of time - more than three years. We selected six institutions of which two are government agencies under Population, Health and Nutrition (PHN) project and four are non-governmental organizations. We provide brief profiles of the institutions and their activities in food security and nutrition interventions.

- *Ministry of Health and Population (MOH)*: The MOH implements the food security and nutrition through its Supplementary Feeding Programme (SFP) in selected districts in Malawi under the Population, Health and Nutrition project supported by the World Bank and World Food Programme. Food supplements (take home rations) are provided at community level for children experiencing growth faltering, pregnant or lactating malnourished mothers. The intervention also provides training for community health volunteers in growth monitoring and promotional activities and in food supplementation. The programme provides the community health volunteers with IEC materials, scales and weighing bags. The project is also based on the mobilization of the villagers in the storage of food supplements.

- *Ministry of Community Services (MOCS)*: The intervention by the MOCS in food security and nutrition is through its Women in Development (WID) project under the Population, Health and Nutrition project supported by the World Bank. The aim of the project is to empower women through promotion of labour saving technologies and income generating activities in three pilot districts. Labour saving technologies were presumed to provide adequate time for women to look for their children while income generating activities would increase their purchasing power in foods. The project first provided food processing hand mills, but were not accepted by women because of their poor performance in labour saving and quality of flour. The project then purchased diesel operated maize mills and promoted other income generating activities such as poultry and piggery.

- *Catholic Development Commission of Malawi (CDCM)*: CDCM is a local non-governmental church-based organization actively involved in relief and social programmes. Their intervention in food security and nutrition has two components. First, they have a Community-Based Supplementary Feeding Programme that began in 1993 after the 1991/92 drought. The project provides maize and Likuni phala (porridge - a mixture of maize flour, groundnuts flour or soya beans flour) to malnourished under-five children, pregnant and lactating mothers, orphans, AIDS patients and the elderly. The food is prepared at feeding centres and given to target groups. Secondly, they introduced the Soya Bean Promotion project in collaboration with the Ministry of Agriculture and

Livestock Development and FAO to combat malnutrition through promoting production and consumption of soya beans. The projects also provide for regular growth monitoring and nutrition/health education for members of feeding clubs. These projects are implemented in all the seven catholic dioceses in Malawi. The supplementary feeding programme is being phased out. The hospital staff are responsible for the identification of the target beneficiaries.

- *Canadian Physicians for Aid and Relief (CPAR)*: This is an international non-governmental organization. CPAR's food security and nutrition activities include food for work, seed multiplication, agro-forestry and community drought mitigation. The food for work component is development-oriented at community level in which food is provided to households that work on community projects identified by communities themselves. These community projects include construction of dams, construction of soil conservation bands and road rehabilitation. Households work for a maximum of four hours per day on community projects and are paid 50 kilograms of maize, five kilograms of beans and iodised salt per household. The seed multiplication component involves provision of hybrid seeds and drought tolerant seeds such as cassava and potatoes to grow in community gardens. Composite maize seeds are also provided, but on credit with in-kind repayment. The target communities are also trained in forestry management and afforestation, farming methods, nutrition education, development and management of income generating activities.

- *Action Aid - Malawi (AAM)*: Action Aid is an international non-governmental organization active in promoting poverty alleviation. Their food security and nutrition intervention includes productivity improvements, land conservation and husbandry, agro-forestry, crop diversification, seed improvement, input and cash credit, market identification and promotion of income generating activities. AAM promotes drought tolerant crops such as cassava and potatoes, with seeds provided free to target households. Seeds for other crops such as maize, beans, sorghum and groundnuts are provided on credit whose repayment is in kind at 20 percent interest. Cash credit is provided to support income generating activities to groups of households. Targeting of the beneficiaries is based on the incidence of poverty and food insecurity.

- *World Vision International - Malawi (WVIM)*: This is an international non-governmental organization also actively involved in relief and development activities. Their activities in food security and nutrition interventions include food for work programmes and input and cash credit to vulnerable groups. The aim of these programmes is to increase agricultural productivity and to enable households to generate additional income that would be used to purchase food items. We evaluated the programme that provide input and cash credit to vulnerable groups. This programme includes creation of agro-forestry clubs which produce nurseries and disseminate information on forestry management; farm input assistance by providing fertilizers and seeds on credit and by linking some households to rural financial institutions; nutrition education and development of small scale enterprises. The target groups are poor households who do not have adequate food throughout the year, and the identification is based on a needs assessment study.

Our methods of data collection for the evaluation of food security and nutrition interventions in the above institutions combined the qualitative and quantitative approaches. We interviewed key informants, project managers and selected beneficiaries for the qualitative assessment of the problems and performance of the intervention programmes. We also obtained some quantitative data from project documents and through a semi-structured questionnaire which was administered to a sample of beneficiary and non-beneficiary households in the selected project areas. We selected one project area for each institution for the administration of the questionnaire. The questionnaire sought information, among other issues, on household characteristics, their participation in the projects, types of interventions, indicators of food security, health and nutrition education. We took anthropometric measurements to assess the impact of the project on the nutritional status of children in the area (Gibson, 1990).

4. Impact of Food Security and Nutrition Interventions

We evaluate the impact of food security and nutrition interventions on the livelihood and welfare of beneficiaries using various simple indicators of food security and nutritional status of children. However, the analysis is deficient in some respects, since all the institutions reviewed in this study did not have baseline data. Alternatively, we interviewed a control group of non-beneficiary

households in each project area under study, save its limitations and problems of interpretation of comparisons between beneficiary and non-beneficiary households. In addition, we utilized the questionnaire to obtain some information on changes in performance of interventions before and after the implementation of the project.

4.1 Socio-economic Characteristics of the Sample Households

We administered the questionnaire to 817 households of which 429 are households that participated in the programmes (hereinafter beneficiary households) and 388 are households that did not participate in the programmes (hereinafter non-beneficiary households). The socio-economic characteristics of the households in study areas show that most households are relatively poor. Of the total households, 84 percent are headed by males and 16 percent are female-headed households. The mean number of people in each household is five. Only 48.7 percent of households have access to drinking water from a borehole and only 4.8 percent of households have access to safe sanitation facilities (flush to septic tank, VIP latrine and latrine with sanitation platform (san plat)).

The major sources of income for the households are crop/livestock sales, small businesses and farm employment. Only 10 percent of households are engaged in non-farm employment, implying that agricultural related activities play a central role in the economic status of the rural households. Expenditure patterns reveal that most households on average spend more money on food items and household assets/items (Chirwa and Milner, 1997). The high proportion of income spent on food is an indication of poverty in the impact areas, with most households living in poor housing conditions (more than 90 percent live in mud floor and grass thatched roof houses). The average mean distances to the clinic and hospital in the project areas are 7 kilometres and 12 kilometres, respectively. About 71 percent of households get their first treatment either from a government or mission hospital/clinic when household members fall sick. Immunization coverage is quite high, with 96 percent of households having their under fives receiving required vaccination.

4.2 Indicators of Household Food Security

4.2.1 Frequency of Meals

Food deficit is one simple measure of impact of interventions in food security and nutrition. We estimate this by the frequency of meals per day and we asked respondents on whether they produce adequate food to meet the basic needs of the household throughout the year. Normally, households with adequate food will have three meals a day. Households will have fewer meals per day as a survival strategy, a reflection of food insecurity. Table 1 reports the number of meals per day households had before and after the intervention. The data shows a progression from one meal per day to two meals and three meals per day. Major shifts have occurred between two meals and three meals per day. This indicator of food security shows that interventions had favourable effects in increasing the quantity of food in all interventions, with very few households having one meal per day in all the projects.

[Table 1 about here]

The improvements in frequency of meals are remarkable in interventions that offer input assistance to households. None of the beneficiary households in AAM and WVIM interventions have one meal per day and a larger proportion have three meals compared to the situation before the intervention. CPAR's food for work project also shows substantial progress in the frequency of meals, with the proportion of households having one meal per day significantly declining from 20.3 percent before the intervention to 7.6 percent after the intervention.

However, we asked beneficiary households a direct question on their assessment on changes in the quality of food since intervention. Most beneficiary households feel that the quality of food in the household has not changed as a result of the various food security and nutrition interventions. About 53.2 percent of all 427 beneficiary households in the study feel that the quality of food has not changed as a result of the interventions. However, there are variations across projects with about 64.7 percent of beneficiaries in the CDCM project, 57.6 percent in the WVIM project, 49.2 percent in the MOH project, 41.7 percent in the AAM project, 36.8 percent

in the CPAR project and 25 percent in the MOCS project, indicating that the quality of food has not improved since interventions.

The interventions that focus on food security are also evaluated in terms of adequacy in food production by beneficiaries. Three out of the six interventions have more beneficiary households producing adequate food than those households outside the target group. About 81 percent of beneficiary households of WVIM project produce adequate food compared with 65 percent of households outside the target group. Similarly, 54 percent of AAM beneficiary households produce adequate food compared to 47 percent of those outside the target group. The same picture emerges for beneficiary households compared with non-beneficiary households in the MOH project, with 62 percent in the former and 60 percent in the latter. More non-beneficiary household compared with beneficiary households produce adequate food in CDCM, CPAR and MOCS project areas. The results on adequacy in food production are consistent with the improvement in the number of meals per day taken by the households.

4.2.2 Farming Methods and Technology Adoption

We also assess the impact of the various intervention on farming methods and adoption of technology. The use of better farming methods and appropriate technology provides long-term solutions to the food security problems. Table 2 presents households' use of fertilizers and hybrid seeds in their farming activities. The general picture that emerges is that beneficiary households have high rates of technology adoption. With respect to fertilizers, except in project areas of MOH, CPAR and MOCS, more beneficiary households use fertilizers than non-beneficiary households.

[Table 2 about here]

The data show that more beneficiary households use hybrid seeds compared to non-beneficiary households, except in the case of MOCS. Use of hybrid seeds is highest among beneficiaries of CPAR, WVIM and AAM. Apart from CPAR, the other two projects provide input credit which has direct effects on the choice of technology. In all the interventions, except MOCS, the use of hybrid seeds is high compared with non-beneficiary households. The use of hybrid seeds among

beneficiary households is as high as 74 percent in the CPAR intervention and as low as 52 percent in the CDCM intervention. However, the ranking of the use of hybrid seeds among non-beneficiary households is similar to that of beneficiary households. We are not able to tell whether the high use of hybrid seeds is due to the interventions or a result of farming methods messages outside the specific interventions.

We also find that a high proportion of households use monocropping, particularly so in projects that offer input credit such as AAM (60.7 percent) and WVIM (69.7 percent) compared to other interventions such as CDCM (16.9 percent) and MOH (42.1 percent). However, a large proportion of beneficiary households also use intercropping methods of cultivation. On average, in all interventions, more than 60 percent of beneficiary households use intercropping cultivation methods. The use of intercropping methods by non-beneficiary households is also high, suggesting that the interventions have little impact on types of cultivation. The high incidence of intercropping merely reflect land scarcity in Malawi.

4.2.3 Crop Diversification

Most interventions in food security and nutrition encourage crop diversification as one of the strategies. Drought tolerant crops such as cassava and sweet potatoes are some of the crops that are encouraged in most food security projects. In addition, nutritious crops such as pulses and vegetables are also encouraged among beneficiary households. Table 3 shows the proportion of beneficiaries growing selected crops before and after the intervention. All the households in the sample project areas grow maize, the main staple food in Malawi. Most beneficiary households also tend to grow pulses and vegetables besides maize. However, the difference between the proportions before and after the interventions with respect to pulses and vegetables suggests that the high proportions can not only be attributed to the food security interventions.

[Table 3 about here]

The effects of interventions on crop diversification show mixed results, but generally show that most projects have positive effects on production of alternative crops. The proportion of households declined for those who grow cassava and vegetables in the AAM intervention,

tobacco and pulses in the MOCS intervention and other crops in the CPAR intervention. The proportion of households did not change for those who grow vegetables in the CPAR and MOCS interventions, tobacco in the CPAR intervention and other crops in the MOH intervention. All crops are consistently encouraged in the CDCM and WVIM interventions. The cultivation of tobacco - the main cash crop in Malawi, improved from being produced by 51 percent of households before to 83 percent after the WVIM intervention. The WVIM project we evaluated is in the main tobacco growing district in Malawi. In the AAM intervention, the proportion of households that grow pulses increased by a 20 percent margin.

4.2.4 Food Security Messages

All the food security and nutrition interventions in this study have a food security and nutrition education component. We therefore assessed the ability within the programme to disseminate necessary information that could benefit the target households in basic knowledge about food security, nutrition and health education. All beneficiaries were asked whether they got advice on various aspects of food security and nutrition education from the project officers. Table 4 presents a summary of responses from beneficiary households. Overall, the data show that inadequate information is given to beneficiary households with less than 50 percent of the households indicating that they got information from the project officers, except in AAM and WVIM in crop husbandry and MOCS in animal husbandry. The core activities of both AAM and WVIM relates to crop production while the core activity of the MOCS project which we evaluated relates to animal husbandry (piggery and poultry). Interventions that emphasise on nutrition such as CDCM and MOH have information bias towards health education, crop husbandry and food storage.

[Table 4 about here]

The food security and nutrition education messages that were mainly disseminated in the CDCM intervention are health education (49.4 percent), food storage (31 percent) and crop husbandry (28.9 percent) while in the MOH intervention more received health education messages (37.5 percent) followed by crop husbandry (35.7 percent) and food storage (28.6 percent). These projects are involved in supplementary feeding programmes and hence their emphasis on nutrition

education. The dissemination of food security and nutrition education in the CPAR intervention is quite low, with only 27.4 percent of households acknowledging health education followed by food storage (26.4 percent) and crop husbandry (24.5 percent). In the AAM intervention 64.4 percent, 39 percent and 33.9 percent of beneficiary households acknowledged crop husbandry, land husbandry and health education messages, respectively.

Food security and nutrition education in the WVIM intervention is relatively higher in most respects. About 68 percent of households acknowledged having received crop husbandry messages, 50.8 percent acknowledged having received food storage messages and 49.2 percent acknowledged having received health education messages. In the MOCS intervention, 74.4 percent of households received animal husbandry messages while 42.1 percent received credit and group management messages and 39.5 percent received health education messages.

4.3 Indicators of the Nutritional Status of Children

All the food security and nutrition interventions have the overall objective of improving the nutritional status of target households. We use indicators of the nutritional status of children under the age of five years to assess the nutrition impact of various interventions. All under-five children from the sampled households were measured to collect their weight and height or length. This information was used to analyse Z-scores for weight-for-age, height-for-age and weight-for-height. Table 5 presents the percentage of children below -2 and -3 standard deviation of the NCHS/WHO reference population according to the three anthropometric indices of nutritional status. We use the word 'moderate' for rates below -2 standard deviations and 'severe' for rates below -3 standard deviation. Significant tests indicate that most of these differences are significantly different implying that the interventions had a positive impact on the livelihood of people in the project area. The only differences that are not significantly different are the moderate underweight for the CDCM project, severe underweight and moderate wasting for the WVIM and the moderate stunting and wasting for the MOCS project.

[Table 5 about here]

Only in two (AAM and MOCS) of the six interventions are moderate rates of underweight of children of beneficiary households lower than those of non-beneficiary households. However, with respect to severe underweight, four of the six interventions show lower rates of malnutrition among beneficiary households than among non-beneficiary households. The proportion of children who are severely underweight in the CPAR intervention (12.7 percent) is much higher than among the non-beneficiary households (5.6 percent). The CPAR intervention focuses on food for work and mainly pays in kind in form of maize, without much attention to other nutritious foods on children.

Similarly, only two of the six interventions have lower moderate stunting rates among beneficiary households than among non-beneficiary households. Severe rates of stunting are lower among beneficiary households compared with non-beneficiary households in MOH, AAM, WVIM and MOCS interventions. Finally, moderate wasting rates among beneficiary households are lower in CDCM, AAM and MOCS interventions but higher in MOH and CPAR than among non-beneficiary households. No cases of moderate wasting were detected among beneficiary households in AAM, WVIM and MOCS interventions and among non-beneficiary households in the CPAR and WVIM project areas.

We also analyse the nutritional status of under-five children by the type of assistance received by the household. A comparison of the types of assistance indicates that there are significant differences in the rates of malnutrition between them (Table 6). Interventions that offer assistance in form of credit facilities show lower rates of underweight, stunting and wasting in cash credit facilities compared to input (seeds and fertilizer) credit facilities. However, we obtain mixed results if we compare malnutrition rates between the free food and food for work types of assistance. For moderate underweight, the rate is higher under free food than under food for work and for severe underweight the converse is true. This is also the case for moderate and severe stunting.

[Table 6 about here]

Beneficiaries were also asked how they perceive the change in the problem of malnutrition in the area since the implementation of various food security and nutrition projects. A high proportion

of beneficiaries feel that the problem of malnutrition has greatly improved except in the case of the MOCS project. More than 75 percent of beneficiaries in other projects witnessed some improvements in malnutrition with 79.5 percent in CDCM, 80 percent in MOH, 77.8 percent in CPAR, 78.6 percent in AAM, 86.7 percent in WVIM and 42.9 percent in MOCS. Actually, compared with other projects, more households in the MOCS project (about 38.1 percent) reported no improvement and 4.8 percent reported worsening in the problem of malnutrition. These results show that the interventions have not provided a complete solution to the problem of malnutrition among beneficiary households.

5. Problems and Constraints in Interventions

The mixed results in the effectiveness of various interventions may be attributed to the problems and constraints in the planning, implementation and monitoring of the projects. We find that most interventions have serious institutional capacity constraints in terms of inadequacy in human resources and transport facilities that affect the implementation and monitoring and evaluation of their activities. Transport problems and inadequate project personnel are apparent in the CDCM, MOH and MOCS projects. Project officers in these interventions are also responsible for other activities of their organization, such as clinical/hospital duties in case of CDCM and MOH and other many community development programmes for MOCS. This means that the level of interaction between project officers and the target communities is very limited.

The problem that is common to all interventions in this study is the poor monitoring and evaluation of projects. CDCM had developed monitoring tools and collects data for growth monitoring, but such data is not analysed to evaluate the performance of the projects. In addition, the take home rations that are given to the target communities are not monitored, and it is possible that other members of the households also benefit. CPAR has no project performance indicators such as outreach, the stock of development projects under food for work and effectiveness of community management. Monitoring and evaluation is also weak under the AAM intervention. AAM at the time of the study was just developing monitoring tools and performance indicators. Although AAM has adequate officers, adequate transport facilities and computers in the field offices, most of the officers lack technical expertise to monitor and evaluate field activities. Similarly, monitoring and evaluation for the MOH and WVIM projects is poor, with

growth monitoring data sometimes collected but not analysed for the evaluation of the project. For the MOCS intervention, data is collected by a third party, but it has never been analysed for monitoring and evaluation of the project.

The other problem in these interventions is that beneficiary empowerment is partial in that most of the policy issues in the interventions are based on a top-bottom approach. Communities are not involved in the design and planning of project activities and there is evidence of poor information flow between the communities and the project managers. For instance, in the CPAR intervention, beneficiaries were not well informed that the composite maize seeds they had received were given on credit basis. For projects that are promoting new food crops, promotion of such special crops is not preceded by training in the appropriate utilization of such crops in order to maximise the nutritional gains.

Finally, most interventions do not have a criteria for targeting beneficiaries and the question of vulnerability to food security is not addressed in the targeting of communities. Needs assessment or baseline studies were not carried out as a basis for identification of the problems of the target communities.

6. Concluding Remarks

The various interventions in food security and nutrition have had a positive impact on the beneficiaries. In most projects, the nutritional status of children is better among beneficiary households compared to non-beneficiary households. The study also shows that malnutrition rates are lower under seed, fertiliser and cash credit interventions compared to free food and food for work interventions. More than three-quarters of the households, acknowledge that the problem of malnutrition has been substantially addressed by the interventions. Technology adoption is high among beneficiaries, although local methods of farming are still prevalent. The projects seem to have some impact on crop diversification especially where interventions are in the form of provision of farm inputs. The number of meals per day has increased after the interventions. Very few households have one meal per day in the period after the project.

However, to improve the effectiveness of the various interventions in food security and nutrition among households, the implementing institutions should consider the following issues. First, there is need to improve targeting of beneficiaries if the interventions are to help the most needy households. Baseline studies need to be conducted to understand the local conditions and to help developing a targeting criteria for the intervention. Secondly, institutions must ensure that they have adequate capacity (personnel, transport facilities, management information systems) before venturing into activities in which they have no competence. Thirdly, monitoring and evaluation should be an integral part of the interventions and should be integrated in the design of the projects. Fourthly, food security and nutrition interventions should encompass other issues that impinge on development such as population or family planning, water and sanitation facilities. Finally, the projects which are based on free distribution of facilities, should strive to phase out the free distribution and endeavour to promote sustainable ways of ensuring household food security and nutrition based on self-reliance such as proper farming methods and support for management of income generating activities.

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Table 1 Number of Meals Per Day Before and After Intervention by Project (Percentages)

Project	Before the Intervention			After the Intervention			Number of Households
	One	Two	Three	One	Two	Three	
CDCM	29.1	60.5	10.5	4.7	76.7	18.6	86
MOH	10.2	55.9	33.9	3.4	55.9	40.7	59
CPAR	20.3	61.0	18.6	7.6	69.5	22.9	118
AAM	8.2	63.9	27.9	0.0	60.7	39.3	61
WVIM	9.2	66.2	24.6	0.0	56.9	43.1	65
MOCS	2.5	65.0	32.5	2.5	62.5	35.0	40

Source: Chirwa and Milner (1997)

Table 2 Use of Fertilizer and Hybrid Seeds by Project (percentages)

Project	Fertilizers		Hybrid Seeds	
	Beneficiary Households	Non-Beneficiary Households	Beneficiary Households	Non-Beneficiary Households
CDCM	50.6	43.3	51.8	50.0
MOH	3.6	8.2	60.7	49.3
CPAR	14.5	15.6	73.6	68.8
AAM	52.5	33.3	68.9	61.3
WVIM	95.5	68.4	71.2	64.5
MOCS	57.5	69.2	52.5	56.4

Source: Chirwa and Milner (1997)

Table 3 Crops Grown by Beneficiaries Before and After Intervention by Project (percentages)

Project	Cassava		Vegetables		Tobacco		Pulses		Other Crops	
	Before	After	Before	After	Before	After	Before	After	Before	After
CDCM	3.7	4.9	39.0	40.2	2.4	4.9	76.8	79.3	17.3	22.5
MOH	11.9	16.9	39.0	42.4	0.0	5.1	54.2	55.9	15.3	15.3
CPAR	7.2	11.7	37.8	37.8	22.5	22.5	52.3	66.7	17.1	14.4
AAM	4.9	1.6	27.9	26.2	63.9	67.2	42.6	63.9	18.0	21.3
WVIM	12.1	18.2	42.4	47.0	50.8	83.3	65.2	66.7	24.2	27.3
MOCS	30.0	32.5	47.5	47.5	37.5	35.0	52.5	50.0	32.5	42.5

Source: Chirwa and Milner (1997)

Table 4 Number of Households Receiving Messages within the Intervention by Project (percentages)

Type of Message	CDCM	MOH	CPAR	AAM	WVIM	MOCS
Land Husbandry	24.1	23.2	16.0	39.0	41.3	26.3
Animal Husbandry	19.3	25.0	17.9	23.7	31.7	74.4
Crop Husbandry	28.9	35.7	24.5	64.4	68.3	34.2
Vegetable Farming	25.3	25.0	18.9	27.1	34.9	35.9
Afforestation	21.7	17.9	20.8	27.1	33.3	10.5
Agriculture/IGA Credit	12.0	10.7	14.2	18.6	30.2	42.1
Food Storage	31.3	28.6	26.4	28.8	50.8	26.3
Clubs or Group Management	16.9	10.7	11.4	18.6	38.1	42.1
Business Plans/Management	14.5	5.4	13.3	11.9	27.0	31.6
Heath Education	49.4	37.5	27.4	33.9	49.2	39.5

Source: Chirwa and Milner (1997)

Table 5 Malnutrition Rates of Children under Five Years by Project (percentages)

Institution	Weight for Age (Underweight) Percent Below		Height for Age (Stunting) Percent Below		Weight for Height (Wasting) Percent Below	Number of Children
	-2SD	-3SD	-2SD	-3SD	-2SD	
CDCM						
Beneficiary	23.9	3.5	45.3	18.6	2.3	86
Non-Beneficiary	23.9	6.0	31.3	13.4	4.5	67
MOH						
Beneficiary	37.3	8.5	59.3	22.0	8.5	59
Non-Beneficiary	36.8	11.8	52.6	35.5	3.9	76
CPAR						
Beneficiary	28.8	12.7	42.4	26.3	5.1	118
Non-Beneficiary	22.2	5.6	36.1	16.7	0	36
AAM						
Beneficiary	16.4	1.6	34.4	13.1	0	61
Non-Beneficiary	26.9	2.6	41.0	16.7	2.6	78
WVIM						
Beneficiary	13.6	3.0	22.7	9.1	0	66
Non-Beneficiary	13.0	2.6	23.4	14.3	0	77
MOCS						
Beneficiary	12.5	5.0	30.0	12.5	0	40
Non-beneficiary	17.1	12.2	29.3	19.0	2.4	41

Source: Chirwa and Milner (1997)

Table 6 Malnutrition Rates of Children Under-Five Years by Type of Assistance (percentages)

Type of Assistance	Weight for Age (Underweight)		Height for Age (Stunting)		Weight for Height (Wasting)		Number of Children
	Percent Below		Percent Below		Percent Below		
	-2SD	-3SD	-2SD	-3SD	-2SD	-3SD	
Seed Credit	19.4	3.9	38.8	18.4	1.0	0	103
Fertilizer Credit	17.8	5.1	37.3	16.1	1.7	0	118
Cash Credit IGA	12.5	0	25.0	5.0	0	0	40
Free Food	31.2	5.6	52.8	20.0	6.4	0	125
Food and Work	28.3	12.5	41.7	26.7	4.2	0	120
Other	27.5	7.5	42.5	12.5	2.5	0	40

Source: Chirwa and Milner (1997)