OPPORTUNITIES INDUSTRIALIZATION CENTERS INTERNATIONAL

Ghana Program

Final Evaluation of the

Food Security Training and Outreach Services Initiative

Title II Development Assistance Program

By

Joe Tabor, Mawuena Dotse, Gordon Ekekpi, and Charles Nornoo

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By

Joe Tabor
Evaluation Team Leader
TANGO International
116 W. Cushing Street
Tucson, Arizona 85701 USA
Tel: (520) 617-0977 FAX (520) 617-0980
email: tango@azstarnet.com

EXECUTIVE SUMMARY

The OICI Title II program in Ghana achieved its goal to increase food security among target populations in Northern Region through interventions that improved the availability, access and utilization of food. The program achieved its food availability goal by training farmers in post-harvest processing and storage, and construction of improved storage structures. It achieved its food access goal by increasing women's ability to earn micro-enterprise income through technical training and material support. The program achieved its food utilization goal by providing borehole wells, well maintenance training, and sanitation training.

The program's strategy of adding knowledge to existing resources was very effective at producing noticeable improvements in food security for all three sectors: agriculture; micro-enterprise; and water and sanitation. To accomplish this OICI uses a team of field extension agents called Polyvalent Community Facilitators (PCFs), highly motivated college graduates who live and work with the selected groups in the communities. These extension agents promote changes in attitudes in addition to improving their client's skills in agriculture, business development, income generation, health, water management, and sanitation. They use participatory approaches to teaching and learning, and use technical materials developed by OICI.

The program has clearly reduced post-harvest losses. Data shows that training alone in harvesting and drying of grain has reduced grain losses to the target levels of less than 5%. The mud silos constructed also provides households added protection of their harvest and further assures household food security. The program also demonstrated that the pesticide Actellic Super® may not be needed if the practices just mentioned are followed. The activities promoted by the program are being replicated by non-program farmers. This by itself demonstrates the success of the program's agriculture sector activities. A major constraint on farmers improving household food availability is the difficulty in accessing sufficient funds to optimally manage their farms. The program found ways of providing production credit to it participants but the demand far exceeded the funds and resources available.

The micro-enterprise women in the program report increased incomes, ability to manage their businesses, and making significant contributions to household expenses. Their husbands are encouraging them to increase their micro-enterprise activities. This suggests major changes in gender roles. Another impressive secondary impact is the increase in child education as a result of greater incomes. Women also report improved household access to food, for example mothers report that they now can give their sons and daughters school lunch money.

The program has clearly improved household food utilization by decreasing water borne disease, especially guinea worm and diarrheal diseases. The sanitation component of this objective was less supported in the design and implementation of the program and as a result the impacts are less apparent. The sanitation awareness generated especially through guinea worm eradication has set the stage for the more difficult task of changing behaviors that are required if significant improvements in hygiene and sanitation are to be made.

This DAP program has allowed OICI and OICG to build their technical, managerial, and infrastructural capacities in food security programming. It also allowed them to demonstrate their abilities through this very successful program. The most impressive demonstration of their capacity is the collaboration and respect that they receive from governmental and non-governmental organizations in the region.

TABLE OF CONTENTS

1. INTRODUCTION

1.1. Objective of SOW

The objective of the evaluation is to provide an external and impartial assessment of the results achieved by the program focusing on population-level impacts, establishing plausible links between inputs and impacts. Further, the evaluation will document lessons learned to serve as tool to strengthen the design and implementation of a follow-on DAP, as well as other development programs in the Northern Region.

1.2. Brief Description of Program

The goal of the OICI Title II program in Ghana is to increase food security among target populations in the Northern Region of the country through interventions that impact availability, access and utilization of food. Specific development activities are expected to contribute towards the goal. Training of target farmers in post-harvest processing and storage, and construction of improved storage structures are expected to reduce crop production losses and therefore increase food availability. Food access meanwhile is promoted by increasing women's potential to earn income by providing technical skills and equipment in various agro-processing activities *e.g.* improved pottery production, rice processing, cassava processing, honey and beeswax production. Finally, the provision of potable water wells, well maintenance and sanitation training is expected to enhance food utilization by reducing the incidence of water-borne diseases.

OIC Tamale (OICT) was launched in 1999 to implement the food security program, utilizing resources from 100% monetization of PL 480 Title II commodities in Ghana. OICT is a partnership program between OIC International (OICI) and its affiliate, OIC Ghana (OICG), with OICI as the lead Cooperating Sponsor and OICG a Recipient Agency. OICI envisions that the OICT program will devolve to OICG at the expiration of PL 480 funding; hence the built-in institutional capacity-building interventions under the current DAP.

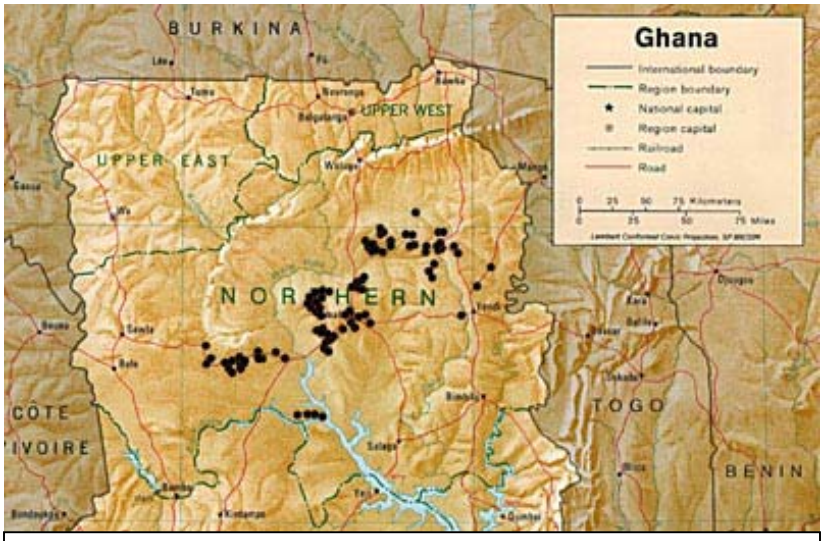


Figure 1. Location of participating communities.

The program is operating in 141 communities of which 75 have agricultural activities, 115 have water and sanitation activities, and 46 have micro-enterprise activities (Figure 1).

1.3. Complementarity with USAID and GOG Strategies and Priorities

There have been conscious attempts by various successive governments of Ghana, NGOs, groups and a few individuals to fight poverty and its associated food insecurity in the country. Food insecurity in the three northern regions of Ghana (Upper East, Upper West and Northern Regions) however, remain the most serious problem compared to other regions of Ghana, hence the presence of many development organizations in these regions. They work in the areas of agricultural extension services, credit, infrastructure development, child survival, health and nutrition, agro-forestry and primary education.

OICI/OICG therefore by targeting the most food insecure households in the Northern Region for its development activities has fulfilled its mission of assisting the most vulnerable in the society and supporting government's efforts to improve standard of living in the country and the Northern Region specifically.

The training provided by OICI/OICG in post-harvest loss techniques, marketing and basic business management skills as well as the construction of household and community storage structures will help improve household food availability. The construction of community potable water sources coupled with training in pump maintenance and sanitation will also meet the target population's need for clean and safe water sources. Target women are also being assisted to diversify and augment their income through training in beekeeping, cassava processing, pottery-making and rice processing. All these activities will complement the government poverty reduction strategy in the region.

The program's agricultural activities also directly fit within the Mission's objective to increase the market value of agricultural products. Specific intermediate results addressed by the program include increased use of improved production practices, improved management, improved post-harvest handling, and increased information dissemination. The program also complements the Mission's sub-goal, which is improved productive capacity of Ghana's workforce, specifically those in the agricultural sector, by providing access to potable water. This intervention indirectly contributes to rural productivity in terms of improving health, reducing illnesses, and providing more productive work hours for adults and children.

1.4. Significant Challenges Faced in Program Implementation

The program began receiving monetization proceeds later than expected. This problem was amplified when the FY2000 local currency lost much of its value through rapid depreciation and domestic inflation. As a result of this US$500,000 short fall, OICI scaled back program targets as reflected in the Cooperating Sponsor Results Report and Resource Request (CSR4) submitted to USAID on 25 April 2001 (OIC1, 2001b).

The first monetization proceed was received in May 2000, nine months into the first fiscal year. As a result, there was considerable setback in program start-up as the bulk of FY 1999 resources were received in FY 2000. Due to the consortium arrangement with other Cooperating Sponsors in Ghana, monetization proceeds are received from every call forward made throughout the year, and distributed proportionally across all consortium members. During FY 2000, the Ghanaian cedi suffered its worst drop in history (from 2900 to 6500 cedis per US$1.00 from October 1999 to September 2000), which has decreased the amount of resources available to the program.

Civil unrest in Saboba-Chereponi and Yendi Districts forced the program to remove its staff from the three communities it was working and prevented further expansion to other communities in these districts.

1.5. Overall Assessment of Program Goal Achievement

1.5.1. Agriculture

The program has clearly helped assure household food availability in its targeted communities. This was achieved during a period of lower than average agriculture production for the region. The program has achieved its goal of reducing post-harvest losses of grain and legumes to less than 5%. It also helped households improve their marketing of grains and legumes by enabling them to postponing sales until April through July when prices are at their highest. The objective was achieved mainly through training about better method of harvesting, post-harvest handling of produce, produce marketing and business skills. Mud-silo grain storage structures were also introduced into the communities and community members trained on how to construct them. These members are now making supplemental income by building mud-silos for other members of their communities.

1.5.2. Micro-enterprise

The program has clearly helped assure household food access in its targeted communities by promoting micro-enterprises that significantly increase women's incomes. The program has exceeded all of the goals for this objective. The micro-enterprises are appropriate to the local biophysical and socioeconomic environments. Sustainability of these enterprises is likely since the products produced have local, accessible markets with excess demand. Because of this program intervention, women are contributing more toward household expenses and their husbands are supportive of this change in gender roles (see side box).

"***Our soup is no longer the same. Courtesy of our wives, we get better soup to eat."*** Saating Naa, Naa Naporo, at Zagyuri;

1.5.3. Water and sanitation

The program has clearly helped improve household food utilization in its targeted communities by decreasing water borne disease, especially guinea worm and diarrheal diseases. The program is expected to achieve all of the goals for this objective, including the construction of borehole wells for 28 communities. The sanitation component of this objective was less supported in the design and implementation of the program and as a result the impacts are less apparent. The training of 115 WATSAN committees and the sanitation awareness generated especially through guinea worm eradication has set the stage for the more difficult task of changing behaviors that are required if significant improvements in hygiene and sanitation are to be made.

1.5.4. Organizational capacity building

This DAP program has allowed OICI and OICG to build their technical and managerial capacities in food security programming. It also allowed them to demonstrate their abilities through this very successful program. Part of the capacity building included the recent construction of Kumbungu Training Center where they have already hosted MOFA trainings. They have also used the site for root and seed multiplication to support the program's agricultural sector activities. The most impressive demonstration of their capacity is the collaboration and respect that they receive from governmental and non-governmental organizations in the region.

2. AGRICULTURAL SECTOR

The primary focus for the agriculture sector was to improve food availability for households. The program was to achieve this by reducing household post-harvest losses of stored grains and legumes and by improving the marketing of the household's farm products.

2.1. Brief Description of Interventions

A major factor to food insecurity in Northern Region is high post-harvest losses of grain and legumes[1]. Poor rural storage infrastructure and inadequate marketing opportunities are major factors contributing to these losses (Azu, 2001). These factors also compel farmers to sell off most of their produce soon after harvest thereby receiving the lowest returns on their investments. Additionally, the recent and rapid spread of the larger grain borer (the storage pest *Prostephanus truncatus)* further threatens household food security with even higher storage losses. A key strategy to enhancing food security in the program's targeted communities was to reduce post-harvest losses through the following activities:

- Farmer training in post-harvest food processing and storage;
- Construction of storage facilities for households and communities;
- Training of farmers in the maintenance of storage facilities; and
- Training farmers in produce marketing and basic business management skills to increase production.

The evaluation team found that these agricultural activities of the DAP helped assure household food availability and were appropriate to the local biophysical and socioeconomic environments.

2.1.1. Construction of storage structures

Stevenson & Andan (2000) recommended the program support for the construction of both household and community storage structures. Household structures would provide safer grain storage for meeting household food needs while community storage structures were recommended for relatively higher grain production areas. Both structures would help allow farmers to store grain longer in order to sell when prices peak, generally between April and July.

Mud-silos are new to the targeted communities in the Northern Region. They are recommended by the Post-Harvest Development Unit of the Ministry of Food and Agriculture (MOFA) and are considered to be the most effective structure for grain and legume storage in the region. Mud silos have a longer life-span (10 to 15 years) compared to indigenous structures like the *kambong and kunchung* (2 years), are capable of storing and maintaining quality of grain over longer periods than the indigenous structures, and they provide greater protection from the larger grain borer. The structures can be made from locally available materials (clay, straw and water). The major limiting factor to their construction is the lack of knowledge on how to build them. The program hired MOFA trained artisans to construct the silos in targeted communities and to train the residents on how to build them. Participating farmers provide construction materials (clay, straw and water) and meals for the OICI hired artisans. The mud silos serve as a demonstration to non-

[1] MOFA (2001) estimates that post-harvest losses of grains and legumes in the Northern Region range from 25 – 35% annually. However, the impact survey found that non-program community households report 14.4% losses (90% CI, 9.4-19.5%) (Table 4). This difference in the two data sources may be due in part to differences in the definition of "loss."

program participants and the program-trained community members are able supplement their income by constructing new silos as the demand increases.

The program provided **community storage structures** for six high grain-producing communities so farmers could store their grain until prices peaked (April – July). The program provided funds for skilled labor, roofing materials and cement while the communities provided unskilled labor for the construction. In Gushegu/Karaga District the program constructed a structure in Shelanyilli, Nalogu, and Nyong-nayili communities. The program also constructed three structures in collaboration with the Center for Agriculture and Rural Development (CARD), a local NGO, that helped mobilize the communities. Two of the structures were constructed in Saboba/Chereponi District for the Wapuli and Nakpanbuni communities. The third one was constructed in Desikura of Yendi District. The program also collaborated with MOFA in the rehabilitation of underutilized MOFA grain storage structures in program communities (Wantugu, Gaa, Kpatinga, Sung, and Shielilanyili) (Annor, 2001).

2.1.2. Training

The program trained community members and farm households in post-harvest processing and storage by using well formulated and regularly updated training modules. The technical content of these training modules described the causes of grain and legume spoilage, techniques for improving harvesting and drying, the proper formulation and application of Actellic Super®, and safe storage and use of treated grain. The training and demonstrations provided farmers with the necessary skills for the effective and efficient use of the household and community storage structures for post-harvest loss reduction.

Training also focused on improving farm cultivation, management, and marketing skills. The goal was to provide farmers with relevant knowledge, skills, and analytical tools for approaching farming as a business and allow more effective farm management, planning and budgeting of household resources.

2.1.3. Inventory credit program/inventory storage services (ICP/ISS)

The program's improvement of household storage practices enabled its participants to use ICP/ISS. The inventory credit program and inventory storage services allowed farmers the opportunity to sell their produce at peak price periods (April – July) rather than low price periods soon after harvest (October – December). ICP provided farmers with cash loans after harvests. The loans were secured by stored produce. This provided farmers with needed cash without having to sell their produce when prices are at their lowest. Farmers at the time of storage received 90,000 cedis (US$11.25) per 100 kg of maize stored as advance payment from the program. The stored gain was sold at 180,000 cedis (US$22.50) per 100 kg during the lean season (April-July). A total of 150.6 metric tons (MT) of grain were stored under the ICP. The ISS provided grain storage to farmers who did not have storage facilities for their surplus produce and who did not need to sell their produce for immediate cash. A total of 36.1 MT were stored under the ISS program.

2.2. Achievement of Results

The program has clearly helped assure household food availability in its targeted communities. This was achieved during a period of lower than average agriculture production for the region (Table 1). Most of the agriculture sector indicators, their baseline values and targets for this sector

were changed from the initial DAP proposal (Annex G; OICI, 1998a&b and 2001b). The evaluation team found that although the indicators were improved, many lacked adequate definition. This left some of the LOA targets open to interpretation.

Table 1. Average crop yields (MT/ha) in the Northern Region, Ghana.

Crop	1998	1999	2000	2001
Maize	1.55	0.98	0.80	0.70
Rice	1.80	2.32	2.44	2.1
Groundnuts	0.92	0.54	0.66	0.70
Cowpea	0.90	0.69	0.76	0.78
Sorghum	1.11	0.92	0.72	0.80

Source: PPMED (Agric Statistics & Census Div.) MOFA.

2.2.1. Meeting targets

Number of grain and legume storage facilities constructed[2]. The program has already exceeded its revised LOA target to construct 2400 grain and legume storage facilities (OICI, 2001b). A total of 2504 mud silos (in addition to the community storage structures) (104% of target) have been constructed to date and program personnel expect to construct a total 2600 for LOA (108% of the revised target and 87% of the initial target; OICI, 1998a&b). The structures have enabled program beneficiaries to participate in other activities like ICP/ISS and are greatly appreciated. This is an activity indicator of the program with a baseline of zero.

In addition to structures built by the program, a significant but undetermined number of mud silos have been built by program trained participants and many more silos are planned for the 2002 harvest. During interviews with the evaluation team, participants expressed a high demand for the mud silos even in communities where the silos have not been introduced, for example participants and non-participants in Kpilo, Zantelli, Kusawgu, Wambong, Tolon, Gbullung, Kanshegu, and Laanga indicated their desire for mud silo demonstrations and training. The impact survey confirms this finding (Table 2) except in two communities where three households reported using mud silos in 1999 but not for 2001 storage for unknown reasons. Nevertheless, the apparent high demand for these structures suggests that the activity is appropriate for the environment and is effective for the control of grain and legume storage pests.

The program followed the recommendation of Stevenson & Andan (2000) as described above and also constructed three community storage structures in Yendi and Saboba/Chereponi Districts in collaboration with CARD and three community storage structures in Gushegu/Karaga District. The program also collaborated with MOFA in the rehabilitation of five underutilized MOFA grain storage structures in program communities under the ICP/ISS program (*i.e.*, Wantugu, Gaa, Kpatinga, Sung and Shielilanyili).

[2] Number of grain storage structures that the program paid for construction.

Table 2. Mud silo usage of a sample of households interviewed in the impact survey. This sample data is an overall estimate of silo usage. Communities with 1999 mud silo usage were introduced to them by the ADRA DAP.

District	Community	Sampled Households Using Mud Silos		
		1999	2001	Change (1999 to 2001)
Non-Program Community Households				
Gushegu/Karaga	Kpataribogu	0%	0%	0%
Savelugu/Nanton	Duko	0%	0%	0%
Tamale Rural	Zujum	0%	0%	0%
Tolon/Kumbungu	Kurivuliyili	0%	0%	0%
West Gonja	Mempeasem	0%	0%	0%
Total Households Sampled		0%	0%	0%
Program Community Households with Agricultural Training				
Gushegu/Karaga	Bulugu	13%	63%	50%
Gushegu/Karaga	Gaa	0%	43%	38%
Gushegu/Karaga	Pishigu	0%	100%	100%
Gushegu/Karaga	Pisinga	0%	0%	0%
Gushegu/Karaga	Pisinga	0%	0%	0%
Gushegu/Karaga	Zori Yapala	0%	100%	100%
Savelugu/Nanton	Damdu	38%	38%	0%
Savelugu/Nanton	Fazihini	38%	88%	50%
Savelugu/Nanton	Kanshegu	14%	43%	29%
Savelugu/Nanton	Kparigilanyili	100%	75%	-25%
Savelugu/Nanton	Langa	38%	38%	0%
Savelugu/Nanton	Naprisi	100%	100%	0%
Savelugu/Nanton	Naprisi	43%	29%	-14%
Savelugu/Nanton	Sahanayili	100%	100%	0%
Savelugu/Nanton	Tibali	50%	63%	13%
Tolon/Kumbungu	Gbullung	25%	25%	0%
Tolon/Kumbungu	Tali	14%	43%	29%
West Gonja	Busunu	0%	0%	0%
West Gonja	Kawonkura	0%	0%	0%
West Gonja	Kpabusu	0%	0%	0%
West Gonja	Tailorpe	0%	0%	0%
Total Households Sampled		26%	45%	19%
Program Community Households without Agricultural Training				
Tamale Rural	Dohini	0%	0%	0%
Tamale Rural	Jakarayili	0%	0%	0%
Tamale Rural	Kobilmahagu	0%	0%	0%
Tamale Rural	Kukuo	0%	0%	0%
Tamale Rural	Zagyuri	0%	0%	0%
Tolon/Kumbungu	Gbanjong	0%	0%	0%
Tolon/Kumbungu	Kumbugu	0%	0%	0%
Tolon/Kumbungu	Logshegu	0%	0%	0%
Total Households Sampled		0%	0%	0%

Number of households trained in proper storage practices for grain and legumes[3]. To date 2488 households received training in appropriate harvesting and post-harvest grain and legume handling and storage practices. This is 89% of the revised LOA target (2800; OICI, 2001b) and program personnel expect to meet this target by the end of the program. The initial DAP target was 3600 households (OICI, 1998a&b). This is an activity indicator of the program with a baseline of zero.

During community focus group discussions program beneficiaries told the evaluation team that the training has helped them reduce post harvest losses and that they want more training. A post harvest loss study (described below) supports this finding and suggests that training, by itself, in grain harvesting and handling reduced household grain losses enough to meet program goals.

Number of households who receive training in farm marketing and business management[4]. The program has already exceeded its revised LOA target to train 600 farm households in farm marketing and business management (OICI, 2001b) and farmers are improving their farm management as a result (see side box). To date 767 farm households (128% of target) received training and program personnel expect that a total of 900 will be trained for LOA (150% of the revised target and 112% of the initial target of 900 household; OICI, 1998a&b). This is an activity indicator of the program with a baseline of zero.

During community focus group discussions program beneficiaries placed a high value on this training and said it complemented the use of mud silos by allowing them the opportunity to sell their produce at peak price periods (April – July) rather than during low price periods soon after harvest (October – December).

Thanks to OICI agricultural training, Mohama Yakubu and Sedu Karim in the community of Kpilo now cultivate less area with better weeding and produce more grain with less labor. The time they save is now spent on other productive activities like market trading and annual home repair.

Number of months of stored grain and legume availability[5]. Amevor & Donkoh (2002) estimated that a majority of agriculture training participants have had some of their 2001 harvest available for at least 8 months. The revised LOA target is 9 months, increased from the initial LOA target of "6 to 8 months" (OICI, 1998a&b and 2001b). A baseline value of 7.5 months was calculated by linearly interpolating baseline study data that was reported in 3-month increments (Asuni, 2000, p. 15). The impact study results did not show any significant changes in this indicator between 1999 and 2001 for program households (agriculture

[3] The number of households reported are the number registrants for the training program. Only a few people consistently missed the training sessions. They were removed from the registry and were not counted as trained.

[4] The number of households reported are the number registrants for the training program. Only a few people consistently missed the training sessions. They were removed from the registry and were not counted as trained.

[5] The number of months after harvest when only 50% of a sample of agricultural training participants still have stored grain.

or non-agriculture training recipients) or for non program households. Response for all three groups in 1999 and 2001 averaged around seven months of availability, similar to the baseline estimation. Table 3 presents this data converted to person-months based on household population. The conversion also did not show any significant program effects. This impact indicator is not robust and is too sensitive to non-program effects.

Percentage of targeted households that have reduced their post-harvest losses[6]. The impact survey clearly shows that the program has reduced household losses of stored grain however this indicator does not capture the effect. One of its problems is that this indicator is poorly defined. The magnitude of target achievement depends on how this indicator is interpreted. Using the impact survey data (Annex H), a literal interpretation of the indicator is that 30% of targeted households (program participant households that received agricultural training) reported a reduction of grain loss (regardless of previous loss levels). Impact survey data also shows a possible spread effect within the program to participant households that did not receive agricultural training. This group reported a 16% reduction in post-harvest losses while non-program households (control group) only reported 5%. Another interpretation of this indicator is presented in the footnote. It includes the target of another indicator in its definition (*i.e.*, achieve losses less than 5%) so that it is consistent with other project goals. Following the footnoted definition, the impact survey data shows that 72% of targeted households (program participant households receiving agricultural training) have achieved losses of less than 5%. By this definition the program is slightly short of its LOA target of 80%. However, while targeted households have not achieved the target, non targeted program household have. The survey data shows that 80% of program participant households that do not receive agricultural training report less than 5% grain losses while 48% of the control group (non-program households) report having achieved losses less than 5%. Clearly this is not a robust indicator of program effects. Insufficient sample size of the survey is one of the likely problems. This indicator may be more useful if the data is collected in recruitment and exit interviews of all participants. The next indicator that is discussed uses the same data and shows significant program effects.

Percentage of stored grain lost[7]**.** The program has achieved its target of reducing post harvest losses to less than 5% (revised target of "3-5%" losses; OICI, 2001b) for those farmers receiving agricultural training by the program. This achievement was confirmed by two studies contracted by OICI, a monitoring study of July 2002 losses (Table 4; Andan, 2002c) and the impact survey (Table 3; Annex H).

Regional agricultural statistics and OICI baseline post-harvest losses range from 20 – 30 % annually (MOFA, 2001). These baseline values are much higher than those reported by the impact survey interviewees. The average of their 1999 reported losses were between 8 to 18%. This difference in the two data sources may be due in part to differences in the definition of "loss." Damaged grain that is not eaten will be fed to livestock unless it is completely inedible.

Data from program monitoring suggests that pesticide use may not be justified or economical if farmers improve their harvesting, grain handling and storage methods.

[6] Percentage of those households with a member participating in the programs agricultural training that have achieved post harvest losses of less than 5%.

[7] Stored grain and legume samples collected from a sample of households with a member that has participated in the programs agricultural training. Percentage loss in weight determined by the "count and weight" method.

Table 3. Household level changes of agriculture sector impact survey data (Annex H).

Statistics	Household Use of Actellic			Person Months of Food Stored		Percent Grain Lost in Storage		Average Months[a] of Food Stored Before Selling			
	1999	2001	Change in Use	1999-2000	2001-2002	1999-2001	2001-2002	All Households		Households with food to sell	
								1999-2000	2001-2002	1999-2000	2001-2002
Matched Non-Program Communities ("control," n=4)											
Mean	9%	9%	0%	121	111	18.0	17.7	3.7	4.3	6.0	6.9
SD	30%	30%	0%	79	76	20.2	20.4	3.4	3.8	2.0	2.0
n	32	32	32	31	31	32	32	31	31	19	19
90% CI	(1-18%)	(1-18%)	(0-0%)	(98-145)	(88-133)	(12.1-23.9)	(11.7-23.6)	(2.7-4.7)	(3.1-5.4)	(5.2-6.8)	(6.2-7.7)
Matched Program Agriculture Communities ("treatment," n=4)											
Mean	10%	23%	13%	75	82	14.4	3.8	5.1	5.9	7.2	8.5
SD	31%	43%	35%	46	50	18.8	4.4	4.3	4.6	3.1	2.8
n	30	30	30	29	29	22	22	29	29	18	18
90% CI	(1-19%)	(1-36%)	(3-24%)	(61-89)	(67-98)	(7.8-21)	(2.2-5.3)	(3.8-6.4)	(4.5-7.3)	(6.0-8.4)	(7.4-9.6)
Non-Program Communities (n=5)											
Mean	18%	18%	0%	127	106	14.7	14.4	3.3	3.5	6.0	6.9
SD	38%	38%	0%	77	70	19.2	19.4	3.4	3.8	1.9	2.0
n	40	40	40	38	38	40	40	39	39	20	20
90% CI	(7-28%)	(7-28%)	(0-0%)	(106-147)	(87-124)	(9.7-19.7)	(9.4-19.5)	(2.4-4.2)	(2.6-4.5)	(5.3-6.7)	(6.2-7.6)
Program Agriculture Communities (n=21)											
Mean	8%	32%	24%	100	123	9.7	4.6	4.3	6.0	7.4	9.8
SD	27%	47%	46%	73	107	13.4	7.5	4.0	5.0	2.2	1.9
n	150	150	150	137	138	135	135	144	144	74	75
90% CI	(4-12%)	(26-38%)	(18-30%)	(90-111)	(108-138)	(7.8-11.6)	(3.6-5.7)	(3.8-4.9)	(5.3-6.7)	(7.0-7.8)	(9.5-10.2)
Program Non-Agriculture Communities (n=8)											
Mean	16%	28%	13%	73	75	8.3	7.0	4.0	4.4	7.7	8.7
SD	37%	45%	33%	47	43	15.3	15.1	4.1	4.5	1.9	1.6
n	64	64	64	55	55	56	57	63	63	31	31
90% CI	(8-23%)	(19-37%)	(6-19%)	(62-83)	(66-85)	(5.0-11.7)	(3.7-10.3)	(3.1-4.8)	(3.5-5.4)	(7.2-8.3)	(8.2-9.2)

[a] Months start on October with April the 7th month.

Data from this monitoring study also suggests that pesticide use on stored grain may not be justified or economical if farmers improve their harvesting, grain handling and storage methods. Post-harvest monitoring data (Andan, 2002b&c) shows that neither storage method nor use of Actellic Super® provides significant reduction (statistically or in magnitude) in stored grain losses when program promoted harvesting and post-harvest handling are used (Table 4). Follow-up studies may show significant reductions in post harvest losses between the mud silos and other storage methods during years of high infestations of the larger grain borer. Continued monitoring is needed to evaluate this hypothesis.

Table 4. Percent of post harvest losses by weight due to insect and mold damage for maize stored in mud silos, *kanbongs*, and jute sacks with and without treatment of Actellic Super®. Mold damage is reported to validate that grain in each treatment group was properly dried.

Treatment	Mean	SD[a]	Range		n[b]	95% CI[c]		Mean	SD	Range		n	95% CI	
			Min	Max						Min	Max			
	June 2002 Insect Damage							July 2002 Insect Damage						
Mud silo treated	2.42	1.47	0	5	12	1.48	3.35	2.00	0.93	0.5	3.5	8	1.23	2.77
Mud silo untreated	2.36	2.54	0	9	22	1.24	3.49	5.80	3.28	2.5	12.5	10	3.45	8.15
Kanbong treated	1.75	1.32	0.5	3.5	4	0.00	3.85	5.50	4.42	2.5	12	4	0.00	12.53
Kanbong untreated	3.38	6.16	0	18.5	8	0.00	8.52							
Jute sack treated	1.79	2.10	0	6	7	0.00	3.73	2.67	1.26	1.5	4	3	0.00	5.79
Jute sack untreated	3.10	3.21	0	11	21	1.64	4.56	3.50	2.14	1	7.5	8	1.71	5.29
	June 2002 Mold Damage							July 2002 Mold Damage						
Mud silo treated	1.25	1.12	0	4	12	0.54	1.96	2.09	1.28	0.5	5	11	1.23	2.95
Mud silo untreated	0.89	1.59	0	6.5	22	0.18	1.59	3.65	1.29	1.5	6.5	10	2.73	4.57
Kanbong treated	0.38	0.75	0	1.5	4	0.00	1.57	2.88	0.85	2	4	4	1.52	4.23
Kanbong untreated	0.38	0.69	0	2	8	0.00	0.96							
Jute sack treated	0.71	1.29	0	3.5	7	0.00	1.90	2.33	0.76	1.5	3	3	0.44	4.23
Jute sack untreated	0.38	0.53	0	1.5	20	0.12	0.63	2.00	0.93	0.5	3.5	8	1.23	2.77

Raw data provide from study conducted by Andan (2002b&c).
a Standard deviation (SD)
b Sample size (n) for each treatment group decreased because of consumption of grain, not from spoilage.
c Two-sided 95% confidence intervals (CI) using the Student's t distribution.

Percentage of households who sell farm produce at highest selling period (April-July)[8]. The program has already exceeded its revised LOA target to increase the percentage of households who sell produce between April and July (OICI, 2001b). To date, the program estimates 57% of

[8] Values reported by the program were unweighted averages of percentages from four groups of sales (grain or legumes and head of households or wives). Number (heads or wives) who sold produce (grain or legumes) at peak divided by those (heads or wives) that sold the particular produce during any time of the year, times 100.

households with participants in agricultural training have sold farm produce between April and July (Amevor & Donkoh, 2002). The impact survey data confirms this with an average selling date of mid-April (7.4 months, Table 3). The initial DAP target was 60% of participation farm household selling at least some surplus at market price for two seasons after training (OICI, 1998a&b). Delaying the sale of surplus produce can substantially increase household incomes. An estimated 26% households sold their 1999 harvest between April – July, using the baseline data (Asuni, 2000) and the same methods of calculating this indicator.

2.2.2. Other achievements

OICI's Polyvalent Community Facilitators after a day of impact survey development and training in Tamale.

The program **has increased the capacity of its extension agents**, Polyvalent Community Facilitators (PCF), to conduct development work and many PCFs plan to seek advanced degrees as a result of the experience and training they received through this program (see side box). The PCFs have received 11 types of training (modules), six of these modules were directly used in their extension work with farmers (three modules on participatory farm management and three on grain and legume storage techniques) and two other modules will be extended during the remaining year of the DAP. Two of the training modules were used to improve the technical competence of PCFs. The program has also increased the capacity of MOFA agricultural extension agents through training on participatory farm management at OICT's newly constructed Kumbungu Training Center.

The **adoption of mud silo technology** was reported to the evaluation team during community focus group discussions and indicates that mud silos are a sustainable technology. Mud silo artisans contracted by the program were required to teach several people how to build mud silos in each of the communities that they worked. As expected, numerous mud silos have been constructed by community members without the direct involvement of the program. The program is not monitoring this replication by program participants nor including these silos as part of its output indicator, "number of grain and legume facilities constructed." Replication of mud silo construction could serve as a good effect indicator.

During implementation of the DAP, some program areas (Savelugu/Nanton, Tolon/Kumbungu and West Gonja Districts) experienced low levels of agricultural production. As a result farmers were not worried about storage issues because they did not produce enough to store. Fortunately the program was able to link its beneficiaries to USDA funding that **provided farmers production credit** for animal traction, seed and fertilizers. This helped farmers increase agricultural production which in turn increased the need for post harvest storage, thus providing greater opportunities for the program to demonstrate its interventions. Credit support for animal traction (provision of bullocks, traction equipment and training) was needed because of the

limited tractor services in the region due to frequent machinery breakdowns and rather high maintenance costs. This allowed timelier field operations, lead to increased production, and enabled farmers to utilize post-harvest technologies and facilities. A total of 58 households benefited from this credit through the acquisition of 29 bullocks, 58 ploughs, 58 ridgers, 58 cultivators, and 15 carts. Credit was also provided for fertilizers (15-15-15 and ammonium sulfate) and seed (maize and soybean) on full cost-recovery basis. A total of 1026 households benefited from credit for fertilizer and seed. As at the time of evaluation 55% of the loans have been recovered, in part due to a bad 2001 harvest from poor rainfall. Many of the farmers interviewed by the evaluation team want to maintain a good relationship with the program and plan to pay off their outstanding loans if the 2002 harvest is good.

The site of OICT newly constructed Kumbungu Training Center was used to **multiply improved cultivars** of cassava, yam, soybean, groundnuts, and cowpea provided by MOFA for distribution to program clients. This program achievement increased accessibility and affordability of improved seed to participating farmers. Multiplying the seed at the training center exposed other farmers to improved seeds and planting material. The improved cassava planting material was made available though **collaboration with MOFA, Savanna Agricultural Research Institute, and the Root and Tuber Improvement Program** supported by USAID. After multiplying the material, the program distributed to targeted communities along with training on rapid cassava multiplication techniques. Due to targeting and scheduling problems this activity was not very successful in some communities in the Savelugu/Nanton and Tolon/Kumbungu Districts. Much of the cassava was damaged by open range livestock. Greater success was achieved in West Gonja District. Farmers in Busunu Kusawgu and Wambong appreciated the high yielding varieties *(Gblemodoade)* that also supported OICI's cassava processing micro-enterprise development. The introduced varieties are helping to assure year round production of *gari* and keeping the processing facility near 100% utilization.

The program helped **introduce a new cash crop**, paprika, that has high export value potential for increasing the income of participating farmers. A total of 28 farmers received credit in the form of seed, fertilizer and other agro-chemicals for the production of paprika. This was undertaken in **collaboration with NASEK** (an international export company).

The promotion of rotational cropping with soybean cultivation has helped **improve soil fertility** and provide farmers with a **productive means of controlling striga**, an endemic parasitic weed that is a major problem in the Gushegu/Karaga District. Nitrogen fixing soybeans are not susceptible to striga and their cultivation serves as a trap crop for striga and reduces the number of viable striga seeds in the soil. Cereal crops that follow in the rotation utilize residual nitrogen fixed by the soybean in a soil relatively free of striga seeds.

OICI is clearly the best NGO collaborator and MOFA is using OICI as an example that they would like other NGOs in the Northern Region to follow.

Key informants confirmed that the program has **effective collaboration with other developmental partners** in the agricultural sector. Partners like MOFA and CARD see the program as filling an essential gap. Mr. Adongo, MOFA's Regional Director of Agriculture and Natural Resources, said OICI is clearly the best NGO collaborator and MOFA is using OICI as an example that they would like other NGOs to follow in the Northern Region. MOFA representatives admit that they need to provide better extension services. They currently provide one agent for 3000 people in Northern Region. MOFA welcomes programs like OICI's that help fill the demand for information and training, especially programs that follow MOFA's recommendations and priorities. **OICI's collaboration**

with MOFA is active; providing training for 42 MOFA agricultural extension agents in participatory farm management, training that proved useful for its OICI field level staff. This institutional collaboration has been duly signed through a Memoranda of Understanding (MOU) with the relevant partners (OICI 2001c; OICI 2000g).

2.3. Challenges

The most apparent challenges are the difficulty in accessing money to cover costs of improving agricultural management and production (*e.g.*, seeds and agricultural chemicals) and to meet household expenses without selling produce when prices are low. These challenges must be met with solutions that are robust to an erratic environment of weather and markets extremes.

2.3.1. Inadequate credit

There has been an increase in farmers' request for credit support in the form of traction services and agricultural inputs. The DAP did not make provision for this component so the program took the opportunity provided by USDA funding for a production credit program in response to farmers' requests. This helped but did not meet the demand. Without credit support to increase production levels farmers would not benefit from training and other activities (*e.g.*, post harvest storage, ICP/ISS program). Even ICP resources could not meet the demand.

2.3.2. Community storage structures and transportation

Community storage structures constructed for the ICP/ISS program were insufficient to handle the demand for ICP/ISS services. Some farmers incurred extra cost for transporting grain over 10 kilometers to the community storage structures. The combination of insufficient storage and limited means for rural transport constrain those farmers with high levels of production.

2.3.3. Construction of household storage structures

The demand for these mud structures is increasing. However their construction occurs in the dry season, posing a challenge to communities will limited access to water. Mud silo construction competes with home repair after the rainy season. Ironically when the rainy season is good, need for storage and home repair are greatest. The period of time that mud is available is often too small to complete both tasks. Home repair takes priority.

2.3.4. Low agricultural production

The targeted districts experienced erratic rainfall resulting in low agricultural production during the program implementation period. Low production contributed to inability of some client farmers to fulfill their obligation to the program in the form of credit repayment. The effects of the drought were especially apparent on the 2001 harvest. To provide perspective, this drought resulted in emergency supply of basic farm inputs to drought affected household in the Northern Region beginning June 2002 by FAO/WFP at the request of the Government of Ghana (FAO/WFP, 2002).

2.4. Discussion of Other Agricultural Evaluation Questions

2.4.1. Measures of adoption and sustainability

Mentioned above, the erratic environment of weather and market extremes that influence farm and household decisions can make the measurement of adoption difficult, especially during the relatively brief period of a program. Many farmers used Actellic Super® for storage (32% of those receiving agriculture training by the program, Table 3) and expressed their willingness to use it again but under the condition of a good harvest in excess of their immediate household needs. In contrast, other program interventions are being copied (incompletely) by non-participants based on what they see participants doing.

The involvement of beneficiaries in the planning and transparent execution of this program helped guarantee the sustainability of the program. The evaluation team finds that most of the agricultural interventions are being adopted and are sustainable. Ironically the harvesting, post-harvest handling, and storage techniques promoted by the program may make the use of Actellic Super® unsustainable by making it unprofitable and thereby discouraging its adoption.

2.4.2. Market accessibility for inputs and outputs

Market linkages are important factors in adoption and sustainability. For example, farmers acknowledged the effectiveness of Actellic Super® for storage purposes and are prepared to purchase it if the availability and accessibility at community levels is assured. Those farmers with high quality grain to sell (thanks to program interventions) can have better access to markets and better prices as groups than as individuals. Large amounts of high quality grain provide buyers incentive to send trucks to remote communities. OICI has done well trying to link the production-marketing-consumption chain but many of needed linkages and relationships are beyond the control and responsibility of this DAP.

2.4.3. Keeping up with auto-adoption

> ***"Farmers whose field's border mine copy whatever I do on my field for they have observed the marked changes on my field"*** Tolon Farmer

This program is among the rare few that should consider how their interventions are being copied by non-participants. For example, farmers in Tolon told the evaluation team that those non-program farmers whose fields border their fields copy practices that they learned from program training sessions (see side box). Fortunately the interventions being copied do not pose any harmful environmental impacts if they are implemented poorly. The main considerations are attribution and how badly executed techniques will reflect on the program. Another consideration is how the program could leverage this behavior to produce greater impact with minimal effort. Can participating farmers be used as community trainers? This interest in program activities could be demonstrated by reporting the number of "non-participating" farmers on the attendance register of OICI's farmer training sessions.

3. MICROENTERPRISE SECTOR

The primary focus for the micro-enterprise sector was to increase food access for households. The program was to achieve this by promoting interventions that would help diversify women's sources of income and thus increase their access to and control of resources. This was done through the training of women in improved production methods and business management. Women in three of the four enterprises also received production equipment.

3.1. Brief Description of Interventions

The enterprises proposed in the DAP were beekeeping, pottery, yam stakes and cassava chip production and processing. During implementation, however, yam stake production was dropped, rice processing added, and the three others adapted to the situation as determined by the baseline study in February 2000. Besides the technical training provided on the specific enterprises, beneficiaries were also exposed to general business and marketing training.

The evaluation team found that the program-promoted micro-enterprises helped assure household food access. They were appropriate to the local biophysical and socioeconomic environments. None were new to the area and all the products produced have local, accessible markets with excess demand.

3.1.1. Cassava processing

Initially cassava production and processing was to focus on the production of cassava sticks and chips but, during implementation, OICI staff realized that processing of cassava into "*gari*," or roasted cassava meal, was more appropriate. *Gari* making converts perishable fresh cassava into a table-ready storable form. It is a popular snack food and is a great means for ensuring food availability in a chronic food deficit region. The program worked with twelve communities in the West Gonja District to construct cassava processing and training centers in each of the communities. These centers were set up as fee-for-service facilities that are owned, operated and managed by women. The equipment purchased for each of the centers consisted of a grater, a screw press, sifters, roasters, and a set of pans. Equipment's book value is 22 million cedis (equivalent to US$2750 per center or average of US$110 per beneficiary).

Commenting on women undertaking beekeeping, an exclusive male activity, Amaama of Kanshegu said

"***We do not only keep the bees, we NOW converse with them"***

3.1.2. Beekeeping

Bee keeping is the only new micro-enterprise introduced by the program and it turned out to be the most demanded by women. Beekeeping was considered a "man's job" in the program area but the program has shown that it can be easily be managed by women, especially considering the techniques and materials that were used (refer to box). The beekeeping intervention focused on the training, distribution of hives, production of honey and beeswax, processing and marketing of honey and honey-related products. Twenty two groups of women were organized with an average membership of 25. Each group was given 50 wooden hives, 6 sets of protective clothing, 6 smokers and 5 swarm-catchers with a book value of 20 million cedis (equivalent to US$2500 per group or US$100 per beneficiary).

3.1.3. Pottery making

Pottery making was selected as an enterprise for the following reasons: (1) OICG's 14 years of experience in pottery making training; (2) the Northern Region's history of traditional pottery making; (3) adequate deposits of clay; and (4) wide demand of fired clay products for various domestic uses. The program recruited women in various communities that had pot making experience and upgraded their equipment, skills, knowledge, and management capability. The program provided six communities a potter's wheel, kiln, tools, and protective shed with a book value of 24 million cedis (equivalent to US$3000 per community or US$120 per beneficiary).

3.1.4. Yam stakes

This intervention was replaced by rice processing. The original DAP approved activity was to have women establish woodlots, grow and sell stakes that would be used to support yam vines so they grow vertically. This management practice greatly increases yam production. At the beginning of the program, OICI personnel determined that this intervention would not be feasible for social reasons. Specifically, women in the Northern Region do not own land and establishing woodlots would be difficult. Moreover, women are not involved in yam cultivation and the intervention would cross gender roles within the household. Husbands who cultivate yam would likely appropriate the vine stakes without necessarily paying for them.

3.1.5. Rice Processing

Women in the Northern Region commonly parboil rice before milling and sell the improved product (*i.e.*, rice in the form of Uncle Ben's® "converted" rice, this rice is also more nutritious with twice the thiamine and riboflavin as polished rice, thus helping increase food utilization). OICI staff saw an opportunity to improve the women's parboiling techniques so that they would produce a greatly improved product. The intervention (training) is widely appropriate since around a third of the Northern Region cultivates rice. Women buy the paddy from their husbands and other farmers, then through the improved techniques recover more marketable rice after milling and, because of its improved quality, sell it at an average 15% higher price than rice processed using unimproved techniques. Only training is provided for the rice processing intervention, no initial provision of equipment is required. Seven groups were assisted to obtain working capital loans to enable them procure more paddy at harvest time to maximize their returns. The average loan per beneficiary was 200,000 cedis (equivalent to US$25). Women in 14 communities have been trained.

3.2. Achievement of Results

The program has clearly helped assure food accessibility for participating households. With one year remaining, the program has exceeded its LOA targets for micro-enterprise activities (Annex G). Program output indicators and their targets were modified slightly from the DAP proposal with the submission of the April 2001 CSR4 (Annex G; OICI, 1998a&b and 2001b). No impact indicators were developed or baseline indicator values on recruited participants measured. Fortunately the magnitude of the impacts was large enough to be evaluated retrospectively through the impact survey (Annex H). The results are described in section 3.2.2.

3.2.1. Meeting targets

Number of women trained in technical skills for micro-enterprise development[9]. The program has already exceeded its LOA target to train 1500 women in technical skills for micro-enterprise development (OICI, 1998a&b and 2001b). A total of 1698 women (113% of target) have been trained: 628 in bee keeping; 273 in cassava processing; 606 in rice processing; and 191 in pottery making. Of the 1698 women, 767 have received farm marketing and business management training and 978 women (58%) have functioning enterprises that are promoted by the program. Program staff will focus the time remaining for the program on women already enrolled in micro-enterprise activities. This is an activity indicator of the program with a baseline of zero. The positive impacts of the program's micro-enterprise activities are clearly attributable to the training and support that participants received (Table 5; Appendix H; and Amevor & Donkoh, 2002).

Number of new micro-enterprises created[10]. The program has already exceeded its revised LOA target of 500 new micro-enterprises created (OICI, 2001b). A total of 628 new women-run micro-enterprises (126% of target) have been created. Beekeeping, requires minimum maintenance cost and practices, and yet can generate substantial revenues for small communities that are dependent on unreliable rain-fed farming. For example, food grains for many household in Kawonkura had run out but honey produced by program participants was sold to provide an average income of 213,000 cedis (equivalent to US$27) per season. This income allowed the lucky beneficiaries to access more food. Program staff expect through additional training of existing participants a total of 650 new micro-enterprises will be created by the end of the program (130% of the LOA target). This is an effect indicator of the program with a baseline of zero. The impact survey found that bee keeping enterprise allowed women to significantly increase their contributions to household expenses (Table 5 and Appendix H).

Number of existing micro-enterprises improved[11]. The program has already exceeded its revised LOA target of 250 improved micro-enterprises (OICI, 2001b). A total of 350 women-run existing micro-enterprises (140% of target) have been improved. Program staff expect through additional training of existing participants a total of 400 existing micro-enterprises will be improved by the end of the program (160% of the LOA target). This is an effect indicator of the

[9] The number of women reported is the number of registrants for the training program. Only a few women consistently missed the training sessions. They were removed from the registry and were not counted as trained.

[10] New micro-enterprises are those that are new to the women (*i.e.*, bee keeping). "Created" enterprises are counted when women have produced a product from the enterprise.

[11] Existing micro-enterprises are those that the women have experience doing either as a business or for household needs (*i.e.*, pottery making and cassava and rice processing). "Improved" enterprises are counted when women have produced products using techniques promoted by the program.

program with a baseline of zero. The impact survey (Table 5 and Appendix H) found that among the existing micro-enterprises promoted by the program rice processing showed the greatest overall impact, allowing many women to significantly increase their contributions to household expenses.

3.2.2. Other achievements

Program training directly and indirectly helped improve household access to food year-round. Women **apply the business management training to other businesses** that they operate. Almost all the women involved in the OICI enterprises have one other micro-enterprise or trading activity that they are engaged in, mainly food processing. The example of Madam Fulera Seidu (side box) is a common one. More difficult to measure are the sociological impacts. These include the empowerment of women, allowing them to better support their families. These activities can also improve intra- and inter-community coordination and potentially reinforce community safety-nets. The team developed other measures of program impacts. The results are summarized below and presented in Tables 5.

Mrs. Fulera Seidu is a beekeeper and a breakfast porridge business operator at Sankpala in the West Gonja District. "***I make more money now because I am able to cost all my expenses in preparing my porridge. I save enough money to run my business and spend the rest on my family.***"

Improved resource access[12]. This indicator turned out to be a poor indicator for measuring impact. This notwithstanding, it could be viewed as a pointer to areas that require much more effort to ensure that resources are made available to enhance implementation. From the perspective of the beneficiaries, besides rice processing, none of the other interventions improved access to production resources (Table 5).

Improved ability to plan[13]. The respondents to the impact survey overwhelmingly (80%) indicated that their participation in the program has improved their planning ability, especially for those involved in rice processing, beekeeping and pottery enterprises (Table 5). In the pottery enterprises, the nature of the intervention required that they work as a group, hence the need to always plan activities.

[12] Reported average change in access to resources for running interviewees micro-business (sum of reported change between 1999 and 2002 where improvement = 1, no change = 0, and worse off = -1 is divided by the sample size and multiplied by 100%).

[13] Reported average change in ability of interviewees to plan and implement business decisions (sum of reported change between 1999 and 2002 where improvement = 1, no change = 0, and worse off = -1 is divided by the sample size and multiplied by 100%).

Table 5. Summary of impact survey result of micro-enterprise sector activities (Annex H).

District	Community	Type of Enterprise	Improved Resource Access	Improved Ability to Plan	Improved Personal Income	1999 Household Expenses Paid by Wife	2002 Household Expenses Paid by Wife	Change in Household Expenses Paid by Wife	Significance between 1999 and 2002 Expenses, one tailed (p value)[a]	Proportion of Women with >10% Increase in Contribution to Household Expenses	Proportion that Considers Enterprise Sustainable	n
Savelugu/Naton	Damdu	Bee Keeping	-100%	43%	71%	67%	69%	2%	0.178	14%	14%	7
Savelugu/Naton	Kanshegu	Bee Keeping	-63%	75%	100%	48%	63%	**30%**	**0.001**	88%	100%	8
Savelugu/Naton	Langa	Bee Keeping	-100%	83%	100%	77%	77%	0%		0%	0%	6
Savelugu/Naton	Naprisi	Bee Keeping	-86%	71%	100%	31%	41%	**37%**	**0.000**	100%	100%	7
Savelugu/Naton	Sahanayili	Bee Keeping	50%	75%	100%	26%	41%	**110%**	**0.001**	88%	100%	8
West Gonja	Kawonkura	Bees & Cassava	-71%	86%	86%	54%	57%	4%	0.178	14%	14%	7
West Gonja	Tailorpe	Cassava & Bees	-29%	100%	43%	66%	66%	0%		0%	0%	7
West Gonja	Busunu	Cassava Processing	-86%	86%	86%	59%	59%	0%		0%	0%	7
West Gonja	Kpabusu	Cassava Processing	0%	0%	0%	60%	60%	0%		0%	0%	1
Tolon/Kumbungu	Gbanjong	Pottery & Bees	-100%	50%	100%	62%	72%	**19%**	**0.000**	100%	100%	6
Tolon/Kumbungu	Logshegu	Pottery & Cassava	100%	100%	100%	25%	48%	**98%**	**0.000**	100%	88%	8
Tamale Rural	Jakarayili	Pottery Making	-100%	88%	100%	53%	66%	**40%**	**0.007**	63%	100%	8
Tamale Rural	Kobilmahagu	Pottery Making	-13%	75%	100%	60%	65%	**8%**	**0.017**	50%	100%	8
Tamale Rural	Kukuo	Pottery Making	-14%	43%	100%	47%	49%	5%	0.302	29%	100%	7
Tolon/Kumbungu	Kumbugu	Rice & Pottery	100%	100%	100%	21%	41%	**113%**	**0.000**	100%	100%	8
Savelugu/Naton	Fazihini	Rice Processing	100%	100%	100%	25%	56%	**251%**	**0.000**	100%	100%	7
Savelugu/Naton	Kparigilanyili	Rice Processing	100%	100%	100%	23%	45%	**140%**	**0.000**	100%	100%	8
Tamale Rural	Zagyuri	Rice Processing	-88%	88%	100%	35%	45%	**40%**	**0.009**	88%	100%	8
		Totals	-20%	80%	93%	45%	56%	62%		62%	73%	126

[a] Paired sample (women) of two means (1999 and 2002) using the Student-t statistic, one tail.

Improved personal income[14]. The respondents to the impact survey indicated that nearly all (93%) or their personal incomes have increased under the program (Table 5). The cassava processing enterprises did not show as big an impact as the others.

Percent change in women's contribution to household expenses[15]. The impact survey found a clear increase in women's contribution to household expenses that is attributable to the program (Tables 5 and 6; Appendix H). This indicator may reflect the beginning of changes in gender roles within the households. Women are reallocating some of their time from farming to running micro-enterprises. The men interviewed expressed approval for this change in their roles since the returns are obvious. There were several stories on how the **women are able to pay school fees** and buy school uniforms for their children. For example, 53% of the women interviewed in Zagyuri reported that their children now go to school in uniforms because of the micro-enterprise income. Additionally, these mothers now provide most of the children pocket money to buy lunch at school.

Table 6. Impact survey comparison of the percent of household contributions paid by women with micro-enterprises in project and non-project communities (Annex H). Kanshegu and Kawankura communities with OICI training are paired to the closest non-program community of similar size.

Community (sample size[a])	1999	2002	Improvement
Duko[b] (n=2)	20%	20%	0%
Kanshegu[c] (n=8)	48%	63%	30%
Mempeasem[b] (n=7)	53%	53%	0%
Kawonkura[c] (n=7)	54%	57%	4%

[a] Number of women interviewed in each community.
[b] Non program (control) community.
[c] Program (treatment) community with micro-enterprises activities (bee keeping in Kanshegu, and bee keeping & cassava processing in Kawonkura).

The impact survey showed that micro-enterprise sector had the highest variability of impacts by communities. Table 6 shows that Kanshegu had 30% improvement in women's contribution to household expenses while Kawonkura only had only a 4% improvement for the sampled households. The reason for this difference was not apparent but if determined may help the program improve targeting and/or implementation of their activities.

3.3. Challenges

3.3.1. Gender issues

The **success of the program makes gender analysis more important**. The increase of women's economic contribution to the household will result in changes in both men's and women's roles. These changes need to be viewed positively by all concerned.

[14] Reported average change in interviewees personal income (sum of reported change between 1999 and 2002 where improvement = 1, no change = 0, and worse off = -1 is divided by the sample size and multiplied by 100%).
[15] Self reported change in women's contribution to household expenses.

3.3.2. Dependence on trees

All of the micro-enterprises promoted in this program are dependent on trees: firewood for cooking the cassava, rice, and clay pots; and shade and nectar for the bees. The need for maintaining tree resources for communities and households is clear but greater amounts of time and resources would be needed than were available during this DAP. The establishment and management of community or individual woodlots can be difficult because of land and tree tenure restrictions as well as lack of immediate returns on invested labor and resources.

3.3.3. Expanding the target population.

All of the micro-enterprises promoted show variable impacts among participating communities. The reasons for this can be many. One likely reason is the diversity of human and natural resources that are available in each community. The challenge in expanding the target population within an area is how to effectively address the resulting wider range of needs that are presented. This program has targeted those with resources to manage and has achieved profound impacts for some households. Although the program has avoided using "a mile wide and an inch deep" approach, based on what program staff have learned, they might consider how the width of the target population can be expanded without losing the depth of impacts.

3.3.4. Literacy and numeracy a constraint on greater impacts.

The success of the program will likely create new demands and needs. The evaluation team found no documentary evidence of a participant-prepared business plan or of any woman using one. The low levels of literacy and numeracy among the women is a likely factor. Nevertheless, there was ample evidence that women are now more aware of their input costs and basing their prices on them. Hopefully as their enterprises grow, the need for improved literacy and numeracy skills will be met to allow good management of larger, more complex businesses.

3.3.5. Expanding markets.

OICI has been helping women expand their market, for example they have helped pottery producers find distant markets for special-order products like flower vases. However more help is needed to expand their markets for products and raw materials (*e.g.*, rice paddy). This will buffer them from local market extremes, such as those caused by very bad or very good harvests years.

3.3.6. Savings and credit.

Savings (*e.g.*, bank accounts, livestock, private woodlots) and credit will become more important to assure sufficient working capital as markets expand and the demand for larger orders increase. Most of the micro-enterprises visited were operating well. However, few of them require some additional support to make them fully independent of OICT. They need to generate a pool of funds so that they can increase the size of their operation. For example, to convey honey from Kawonkura to Tamale (approximately 200 km round trip) currently requires program staff to identify a buyer, negotiate a price and transport the honey to Tamale. If the groups could develop an internally-generated pool of funds they could begin developing independence from OICI. OICI plans to get the enterprises to this capacity by the end of the current DAP, September 2003.

3.3.7. Specific challenges to program implementation.

The following are more specific challenges to program implementation by type of enterprise.

Cassava Processing

- Managing the facilities and keeping the relevant processing records;
- Ensuring regular, reliable and sustainable source of fuel-wood for cassava processing.
- Processors acquisition of operational skills and proper application without regular supervision; and
- Setting up a routine maintenance and usable (consumable) parts replacement system;

Beekeeping

- Increasing hive colonization from 35% to 90%. Current low figure could be attributed to problems with locating hives and the time of the year this is done;
- Storing honey after harvest to reap relatively "higher" lean season prices later;
- More profitable use of the beeswax either through outright sale and/or using it as the raw material base for another enterprise activity;
- Reinvesting income generated into the beekeeping enterprise for higher returns; and
- Establishment of ancillary enterprises to utilize other by-products of beekeeping (*e.g*., wax, pollen).

Rice Processing

- Improving access to rice mills that have the optimum calibration to process different varieties of rice (*i.e*., different sizes and shapes of grain);
- Encouraging the rice farmers to adopt segregation of rice varieties;
- Access of funds to buy paddy for processing and developing storage capacity for stockpiling enough paddy to ensure year-round processing; and
- Ensuring regular, reliable and sustainable source of fuel-wood for rice processing.

Pottery

- Scheduling and sharing access to the single potter's wheel;
- Making enough margins to support members;
- Ensuring regular, reliable and sustainable source of fuel-wood for the kilns; and
- This is a vocational activity that requires more than five years to yield positive returns on investment.

3.4. Discussion of Other Micro-Enterprise Evaluation Questions

3.4.1. Targeting communities and participation requirements

OICI has good targeting and participation in comparison to other DAPs evaluated by team members. We attribute OICI's success to the relatively frequent client visits by highly motivated and qualified field agents coupled with a good selection of interventions. Nevertheless, targeting and participation appears to be an issue in some of the programs communities and is likely to become a bigger issue with more complicated and expensive interventions that show less immediate impacts (*e.g*., livestock production that depends on integrating activities with agroforestry and agriculture). The impact survey (Table 6) showed clear differences in impact between communities that began the same activities at the same time. Some communities prove more challenging than others for achieving program goals so what are the criteria for selecting a

community or participant, and what criteria if any should be used to maintain or sever the relationship? These questions surfaced when the evaluation team visited Kawonkura to find that their new cassava processing mill has effectively sat idle for two weeks because of lack of knowledge about running the mill. Active participation and problem solving seemed lacking compared to other participating communities. OICI staff confirmed that the program has had difficulties with this community on other activities.

3.4.2. Graduating from one intervention to the next

The evaluation team got the impression that some of the women were spending all of their micro-enterprise revenues on family and personal needs, potentially threatening the sustainability of the activity. This raised the question, 'Is there an opportunity for the program to provide more challenging and profitable follow-on enterprises to those participants that demonstrate sufficient desire and capability?' This range of activities could serve multiple purposes: (1) provide incentive for the participants to run their enterprises well; and (2) improve targeting of follow-on activities by identifying people that demonstrate the necessary skills and motivation. For example livestock production and related value added enterprises could provide incentive for project participants to better manage their less challenging, prerequisite activities (*e.g.*, agroforestry) in order to demonstrate to the program that they qualify for the increased support and resources offered with the livestock activities.

4. WATER AND SANITATION SECTOR

The primary focus of the water and sanitation sector was to increase food utilization for households. The program was to achieve this by promoting interventions that would help households maintain potable water sources and sanitation and by assuring that households have access to safe water. This was done through (1) construction of wells and installation of pumps and (2) organization and training of community water and sanitation (WATSAN) committees.

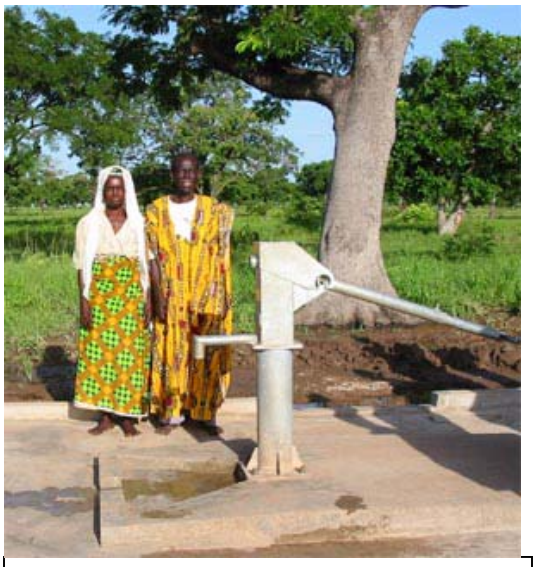
4.1. Brief Description of Interventions

4.1.1. Wells

The program provided selected communities with machine-drilled borehole wells with technology appropriate hand pumps (Afridev and Nira AF85 pumps) mounted on cement slabs. OICI selected communities based on criteria developed from principles of the national water and sanitation sector policy and strategy. These principles are:

- Community selection based on demand and responsiveness in the provision of water facilities;
- Establishment of WATSAN committees and promotion of the community ownership and management of the water facilities;
- Minimum requirement of at least 5% community contribution to capital cost of facilities;
- Communities covers 100% of the cost for facility operation and maintenance;
- Participation of women in the planning, operation and management of facilities;
- Involvement of the private sector in the construction of facilities, supply of materials, and services.
- Maximization of health benefits by integrating the provision of water with sanitation and hygiene interventions.

- Offer the District Assemblies a facultative role in planning and implementation of water and sanitation interventions.
- Offer the Community Water and Sanitation Agency (CWSA) a facultative role in the delivery of water and sanitation facilities.



Selima Mohamid and Abdulai Nassam, WATSAN committee members, stand beside their borehole well and pump in Gbirima.

4.1.2. Training WATSAN committees

OICT formed new WATSAN committees and also revitalized existing ones that were formed by the District Assemblies. OICI used existing community groups, if available, to form the nucleus for forming new WATAN committees. The main activities undertaken in developing WATSAN committees were:

- Train WATSAN committees on hygiene education particularly on water borne diseases (*e.g.* guinea worm, diarrhea, *etc.*);
- Provide cloth filters and training to residents in guinea worm endemic communities;
- Identify and train two hand pump caretakers in each of the communities with facilities provided by either OICI or ADRA;
- Provide basic tools (*e.g.*, spanners) to the trained hand pump caretakers;

The following disease prevention and organization management topics were discussed during the training sessions:

- Guinea worm prevention;
- Treatment of guinea worm;
- Pump site cleanliness;
- Water storage and treatment;
- Environmental cleanliness;
- Safe excreta disposal methods;
- Construction of drainage and soak away;
- Committee organization and meeting procedures;
- Documentation of meetings, decisions made, etc. by writing of minutes; and
- Basic book-keeping to track fees and operation expenses.

4.2. Achievement of Results

The program has clearly improved household food utilization by decreasing water borne disease, especially guinea worm and diarrheal diseases. The indicators and targets for this sector were completely changed from the initial DAP proposal (Annex G; OICI, 1998a&b and 2001b). Initially the program was to provide hand dug wells to 100 communities. At the beginning of the program OICI conducted an assessment of the hand-dug wells provided to communities by ADRA DAP (OICI, 2000f). The assessment determined that 51.5% of the hand-dug wells did not provide year round access to potable water. This assessment agrees with other studies conducted by CWSA (Government of Ghana, 2001). These studies concluded that water is unavailable during some part of the dry season for most of the hand-dug wells in the Northern Region because of the hydro-geological conditions.

The program then decided to provide communities with more effective borehole wells that are safer to construct but also more expensive. The number of wells provided to communities had to be reduced to accommodate the available budget for water provisioning. Also the LOA target for number of communities trained was also reduced. No impact indicators were developed or baseline values of recruited participants measured. Fortunately the magnitude of the impacts was large enough to be evaluated retrospectively through the impact survey (Annex H). The results are described in section 4.2.2.

4.2.1. Meeting targets

Number of wells dug. To date, 19 wet wells have been drilled (68% of the revised LOA target), 16 of them have pumps installed, and 15 of them have been released for the communities to use. The program staff expects to attain the revised LOA target of 28 by the end of the program.

Number of water and sanitation committees trained. The program has already exceeded its revised LOA target to train 110 communities (OICI, 2001b). To date 115 WATSAN committees (105% of target) have been organized and received training. Program staff do not intend to expand WATSAN training beyond the current 115 communities. The initial LOA target was 250 communities trained (OICI, 1998a&b). This is an activity indicator of the program with a baseline of zero.

Percentage water facilities maintained by community[16]. To date the program reports that 48.5% of water facilities are maintained by communities (69% of the LOA target of 70% maintained facilities). Program staff expects to achieve the LOA target by the end of the program.

Percent households in intervention communities with year round access to safe water[17]**.** To date the program reports that 58% of the program's WATSAN communities have year round access to safe water (83% of the LOA target of 70% of communities with safe water year round). Program staff expects to achieve the LOA target by the end of the program.

[16] The number of functioning water facilities divided by the total number of water facilities managed by program trained WATSAN committees times 100%. This indicator measures only the performance of ADRA wells in those communities where OICI trains WATSAN committees. Most of the well in these communities are hand dug and dry out during the dry season.

[17] The use of "household" in this indicator was an oversight. The actual calculation of reported values are based on percentage of the program's WATSAN communities that do not have dry wells when the program's monitoring team visits the well during the dry season.

Percent OICT wells that are functioning. To date the program is achieving its LOA target of 100%; 15 out of the 15 boreholes handed over to the communities are functioning. Of the 19 wet wells drilled, three have not had the pumps installed, and one has not been handed over to the community. The pump in Tailorpe was tested and then disconnected pending the final payment of the community's contribution to capital costs. Program staff expects the LOA target of 100% will be maintained. This achievement reflects the willingness of all communities to own and manage their water (including those without safe sources) through training. The reduction of water borne diseases was apparent and helps motive good well maintenance.

4.2.2. Other achievements

The program has **achieved relatively high success rate in well drilling**. OICT contracted WVI to drill the borehole wells. WVI had to drill 44 wells to produce 19 wet wells. This 43% success rate is remarkable considering the 30% average success rate in the Northern Region (Government of Ghana, 2001). WVI and OICI's relatively high success rate is due to the geophysical and site selection methods being used by WVI combined with effective drilling supervision by OICT.

The program has **helped communities dramatically reduce the incidence of guinea worm infections**. The training offered by OICT and the free distribution of water filters has resulted in the reduction of guinea worm infections, even in communities without access to safe water. This demonstrates that training alone, if the benefits are noticeable, can improve food utilization and food security. The Regional Coordinator of the Guinea Worm Eradication Programme (GWEP) told the evaluation team that the participatory training methods used by OICT have led to a dramatic reduction of guinea worm infections especially in Gushegu/Karaga District that had the highest guinea worm infection rate in the entire Northern Region. The impact survey data (Table 7) showed a greater reduction of guinea worm infections in the program's WATSAN communities than non-program communities. The data shows WATSAN training provided significant protection from guinea worm infections compared to communities with no program activities (odds ratio of 0.1, p=0.08). The data also showed that the WATSAN training offered better protection when compared to non-WATSAN program communities (odds ratio of 0.063, p= 0.008). GWEP provided data (Table 8) that did not show any program effects. It was not possible to investigate the discrepancy between the two data sets.

Creating Social Stigma

The evaluation team visited the community of Gbambu, Gushegu-Karaga District, where guinea worm has been eradicated. During a group interview women teased a man with an imported case of guinea worm. They said that his predicament made him ineligible to obtain a wife.

Proportion of payment spent for water from 1999 to 2002[18]. This impact survey indicator did not show significant project effects however program trained WATSAN communities did on average expend less money on water in 2002 compared to 1999 (Table 9). This savings might be attributed to better maintenance.

[18] The average proportional change in per person household payments for water use. Proportional change was used to account for different time periods of reported values (*e.g.*, week, month, year). The reported household payments were divided by number of people in households in order to reduce the variability caused by household size differences.

Table 7. Annual prevalence of guinea worm cases per 1000 of impact survey households population for those communities that interviewees reported cases. Communities in bold started WATSAN training during the first quarter of 2000. No data was available in blank fields.

Program Communities	Population (1999)	Population (2002)	Prevalence (1999)	Prevalence (2002)	Non-Program Communities	Population (1999)	Population (2002)	Prevalence (1999)	Prevalence (2002)
Gushegu-Karaga District									
Bulugu	105	130	38.1	7.7					
Gaa	104	113	19.2	8.8					
Pishigu	83	113	60.2	8.8	Kpataribogu	178	213	78.7	9.4
Zori Yapala	129	168	15.5	0					
Savelugu-Nanton District									
Damdu	127	138	31.5	14.5					
Fazihini	114	136	131.6	0					
Kanshegu	87	101	11.5	0	Duko	160	146	0	0
Kparigilanyili	123	144	48.8	0					
Langa	108	127	18.5	0					
Sahanayili	138	156	21.7	0					
Tibali	137	145	36.5	0					
Tamale Rural District									
Dohini	98	77	234.7	0	Zujum	140	109	42.9	27.5
Jakarayili	93	93	10.8	10.8					
Kobilmahagu	80	86	12.5	58.1					
Kukuo	106	101	37.7	9.9					
Tolon-Kumbungu District									
Logshegu	83	88	0	11.4					
Tali	77	88	0	0	Kurivuliyili	125	167	0	6.0
West Gonja District									
Kawonkura	56	57	35.7	17.5	Mempeasem	84	95	0	10.5
Kpabusu	117	131	0	7.6					
Tailorpe	80	67	25.0	14.9					

Table 8. Annual incidence of guinea worm cases per 1000 for the impact survey communities with cases reported by the Ghana Guinea Worm Eradication Programme[a]. Communities in bold started WATSAN training during the first quarter of 2000. No data was available in blank fields.

Program Communities	Population (2000)	Incidence (1999)	Incidence (2000)	Incidence (2001)	Non-Program Communities	Population (2000)	Incidence (1999)	Incidence (2000)	Incidence (2001)
Gushegu-Karaga District				10 mo data					
Gaa	1020		6.9	0.0					
Pishigu	3404		5.6	4.6	Kpataribogu	681		2.9	1.8
Savelugu-Nanton District				9 mo data					
Damdu	80HH	(3 cases)	(0 cases)	(1 case)					
Fazihini	196		5.1	0.0					
Kanshegu	616		1.6	0.0	Duko	302		3.3	0.0
Kparigilanyili	128		54.7	0.0					
Langa	280HH	(3 cases)							
Tibali	493		8.1	0.0					
Tamale Rural District				10 mo data					
Dohini					Zujun (Zujung)			(0 cases)	(1 case)
Jakarayili	906		9.8	1.3					
Kobilmahagu	345		26.1	0.0					
Kukuo	4370		11.9	1.6					
Tolon-Kumbungu District				9 mo data					
Gbanjong	1203	1.7	2.5	0.0					
Gbullung	9567		0.1	0.4					
Kumbungu	15300	2.0	0.1	0.0					
Tali	2020	3.0			Kurivuliyili				
West Gonja District				8 mo data					
Busunu			(0 cases)	(4 cases)					
Kawonkura					Mempeasem	1701	1.8	0.0	0.9
Kpabusu (Kpabuso)	1564		3.8	4.8					
Tailorpe	630	6.3	1.6	2.4					

[a] Line List of Endemic Villages, 2001. [b] Non-program communities are adjacent to corresponding program communities.

Table 9. Summary of water and sanitation impact survey data (Annex H).

District[a]	Community	Average Water Use Payment (Cedis per Person)		Proportion Payment Spent For Water, 1999 to 2002	Proportion Time Spent Collecting Domestic Water, 1999 to 2002	New Borehole	Improve Water Use (-1 to 1)	Improved Sanitation (-1 to 1)
		1999	2002					
Non-Program Communities								
G/K	Kpataribogu	547	511	-0.07	1.31	0	0	0
S/N	Duko	1743	5411	2.10	1.05	0	0	0
T/K	Kurivuliyili	0	0	0	1.00	0	0	0
TR	Zujum	0	0	0	1.00	0	0	0
WG	Mempeasem	1157	836	-0.28	0.94	0	0	0
Non Program Total		689	1352	0.96				
Program Communities – WATSAN								
S/N	Damdu	719	655	-0.09	1.06	0	0	0
S/N	Fazihini	13446	2169	-0.84	**0.31**	**1**	**1**	0
S/N	Kanshegu	2422	4911	1.03	1.00	0	0	0
S/N	Kparigilanyili	849	1441	0.70	0.94	0	0	0
S/N	Langa	702	570	-0.19	1.00	0	0	0
S/N	Naprisi	3623	3948	0.09	**0.03**	**1**	**1**	0
S/N	Sahanayili	0	1272	+++	**0.39**	**1**	**1**	0
S/N	Tibali	83	0	-1.00	1.00	0	0	0
T/K	Gbanjong	8678	15921	0.83	0.99	0	0	0
T/K	Gbullung	300	1882	5.27	0.90	**1**	**0.88**	0
T/K	Tali	1609	3230	1.01	0.86	**1**	**0.71**	0
TR	Dohini	0	0	0	1.00	0	0	0
WG	Kpabusu	0	16704	+++	0.73	**1**	0	0
WG	Tailorpe	0	0	0	1.00	0	0	0
WATSAN Total		2317	3764	0.62				
New Borehole Total		3163	4867	0.54				
Program Communities - Non WATSAN								
G/K	Bulugu	0	10927		**0.31**	0	**0.88**	0
G/K	Gaa	0	0	0	1.23	0	0	
G/K	Pishigu	2607	4118	0.58	1.60	0	0.13	0
G/K	Pisinga	294	200	-0.32	1.74	0	0	0
G/K	Zori Yapala	2400	2118	-0.12	1.27	0	0.13	0
T/K	Kumbugu	2140	4264	0.99	1.00	0	0	0
T/K	Logshegu	2894	6831	1.36	1.00	0	0	0
TR	Jakarayili	0	14686	+++	1.02	0	0.63	0
TR	Kobilmahagu	9053	9496	0.05	0.79	0	-0.13	0
TR	Kukuo	23320	27203	0.17	0.84	0	0	0
TR	Zagyuri	2651	6334	1.39	1.00	0	0	0
WG	Busunu	164	4420	26.01	0.90	0	0	0
WG	Kawonkura	0	3149	+++	**0.67**	**1**	0	0
Total Non WATSAN		3502	7211	1.06				

[a] G/K Gushegu/Karaga, S/K Savelugu/Nanton, T/K Tolon Kumbungu, TR Tamale Rural, and WG West Gonja

Proportion time spent collecting domestic water from 1999 to 2002[19]. This indicator shows that well construction can, but not necessarily, result in large savings in time spent collecting water (Table 9). Training in household water use management may provide broader impacts than well construction.

Improved sanitation[20]. This indicator showed that there has been no improvement in hygienic disposal of human waste (Table 9). Nearly every interviewee reported defecating in the fields ("open range") in 1999 and in 2002. This finding was expected and demonstrates the great need for latrines.

Hand pump caretaker training. Program extension agents (PCFs) helped communities identify at least two hand pump caretakers per community, trained caretakers to perform basic above ground repairs on the pumps, and provided them with basic tools (spanners) to perform their duties effectively. The care takers interviewed gave the evaluation team the impression that they have acquired the requisite knowledge and skills for the repair of the pumps by demonstrating the changing the seals and other parts on the pump. The team was also impressed by the types of pumps selected by the program. Afridev and Nira AF85 pumps are suitable for village level operation and maintenance. Caretakers should be able to handle the majority of repairs on the pumps.

Preparation of manual for WATSAN training. For an effective facilitation of WATSAN training, OICI program staff prepared a manual for the extension agents (PCFs). The evaluation team finds the manual useful and commends OICT for the effort. The manual is of good quality and compares favorably with manuals prepared by other programs. The methodology is consistent with that of other programs.

4.3. Challenges

4.3.1. Sanitation and hygiene education.

Although the successes in reducing guinea worm infections through hygiene and sanitation education are impressive, intensification of the hygiene and sanitation messages is needed in all the communities. Organizing periodic follow-up workshops for the WATSAN committees and giving the committees materials to conduct education sessions in the communities would help fill this need and assure sustainability. The follow-up training could be implemented within the framework of general follow-up training for WATSAN committees and pump caretakers. The program could consider preparing hygiene messages in pictorial forms for the WATSAN committees.

None of the communities visited by the evaluation team had a safe system of excreta disposal; all of them used open defecation ("free range"). Given this observation and the need to maximize health benefits through the integration of water, sanitation and hygiene education, OICT could consider the promotion of subsidized low-cost household ventilated improved pit (VIP) latrines in the beneficiary communities with improved water facilities. The level of subsidy could be

[19] The average proportional change in time spent in collecting water for household use. The smaller the value the small proportional amount of time spent collecting water in 2002 compared to 1999.
[20] This indicator is an average of each interviewee's responses regarding where they defecate ("go to the bush"). Each interviewee was classified either 1 for improved, 0 for no change, -1 for worse hygiene practices from 1999 to 2002.

consistent with what is being provided by the Community Water and Sanitation Agency in the Northern Region. Discussions with women in the communities indicate their desire to have safe sanitation.

The most noticeable "improved" sanitation practice adopted by communities is digging a shallow hole for defecation and covering it after the event. This is considered an improvement on the open "free range" system prevalent in the communities. However, this practice is essentially ineffective in reducing soil borne pathogens (*e.g.*, hookworm and round-worm) that are threats to improved food utilization.

4.3.2. Documentation of WATSAN committee activities

Despite the training offered to the WATSAN committees on organizational procedures and recording of transactions, the evaluation team observed that none of the WATSAN committees had recorded its transactions (*i.e.*, minutes of meetings, payment register). This is principally due to the low level of literacy in most of the communities. Documenting WATSAN activities is important in validating decisions and promoting transparency and accountability of finances. Given the need to record the key activities of the WATSAN committees, the program could devise a simple and symbolic format for documenting WATSAN activities.

4.3.3. Distribution network for spare parts.

The evaluation team observed that the communities are not yet linked to the private sector spare parts distribution system for hand pumps being promoted in Tamale by CWSA through Foundries for Agricultural Machinery. This linkage is vital given the need for the communities to purchase spare parts for their pumps. Out of ten WATSAN committees interviewed, seven were unaware of the sources of spare parts within the new network. One community (Busunu) reported a source of spare parts supply (the Catholic Diocese of Damongo, its benefactor).

4.3.4. WATSAN handbook

The performance of the WATSAN committees could be enhanced through constant reference to a handbook or manual on their activities. The evaluation team observed the absence of any such document for the WATSAN committees. The team therefore recommends the preparation of such a document for the communities.

4.4. Discussion of Other Water and Sanitation Evaluation Questions

4.4.1. Effective use of water from boreholes

In all the communities with boreholes that the evaluation team visited, residents are effectively using the water from the boreholes for drinking and other activities (*e.g.*, cooking, washing, dry season gardening, etc.) The women of Tali and Naprisi in the Tolon/Kumbungu and Savelugu/Nanton Districts describe the water as being more precious than gold because it gives them life. People can benefit from additional training on rational use of water, especially as communities grow and water demand increases or during periods when the well cannot supply all of the community's water needs (*e.g.*, low yields during the dry season, during pump breakdowns). This training and knowledge will allow them to conserve potable water and use other water sources for purposes not requiring high quality water (*e.g.*, gardening, washing clothes). Improved water management can also save time when the distance to the borehole is

further that other, more convenient sources of water (*e.g*., rainwater runoff collection, especially from metal roofs if the conversion from thatch roofing become popular and affordable).

4.4.2. Maintenance of hand pumps at the community level

To complement the efforts of generating maintenance funds, OICT could improve linkages between communities and area mechanics that might be required for repairs beyond the capability of the caretakers. All the communities visited have mechanisms for the generation of funds towards the cost of repairs (Table 10).

Table 10. Type of fund generation mechanisms for well maintenance instituted by the communities visited.

Name of community	Fund generation mechanism
Gbirima	2000 cedis per male per month 1000 cedis per female per month
Tindang	1000 cedis per male per month 500 cedis per female per month
Zori-Yapala	pay as you fetch of 50 cedis per basin
Busunu	pay as you fetch of 50 cedis per basin
Cheyohi	dependence of community fund which currently stands at over 1,000,000 cedis
Tali	pay as you fetch of 100 cedis per basin
Gbirima	500 cedis per adult per week
Sahanayili	500 cedis per adult per month
Naprisi	2000 cedis per landlord per month

4.4.3. Appropriateness of technologies, practices and training being promoted

The borehole wells provided are very appropriate and cost-effective given that hand-dug wells are generally ineffective in supplying year round water. Borehole wells, through their year-round supply of water, maintain the health benefits that leads to better food utilization. The Afridev pumps installed on the wells are similarly appropriate to the conditions in the rural communities because it is suitable for village level maintenance. The training of pump caretakers and WATSAN committees has also been appropriate. The supply of cloth filters and tube filters concurrent with guinea worm prevention training is appropriate and effective as demonstrated by the reduced incidence of the disease. The adoption of covering feces after defecation, should be considered a positive first step (although ineffective) along a difficult road of promoting appropriate hygiene and sanitation practices.

4.4.4. Relationship between safe water and sanitation and food security

The provision of safe water has contributed to an improvement in the health and living standards of residents of beneficiary communities. Specifically, the reduction of guinea worm cases in the intervention communities has resulted in the existence of a healthy and more productive workforce for agricultural production and its related activities. Program beneficiaries interviewed by the evaluation team also report noticeable reduction in diarrheal disease that inhibits food utilization.

5. CROSS-CUTTING ISSUES

5.1. Brief Description of Cross-Cutting Issues

5.1.1. Baseline and indicators

Baseline data collection, indicator development, and impact monitoring were poorly integrated for this program. This deficiency is a product of the program design (1998) viewed from a 2002 perspective of program monitoring and in no way reflects poorly on the program's monitoring and evaluation specialist who has done an excellent job and has shown initiative in completing tasks outside his scope of work. Specific problems are:

- Baseline data was collected from random households in communities that the program initially selected. This made the data unusable for impact assessment because the population within the surveyed community was different than the people selected for program activities and the communities surveyed were not representative of the communities the program eventually served. One way to avoid this problem is to have each newly recruited participant complete a questionnaire to establish a baseline for their household.
- Much of the baseline data collected was not related to many of the program indicators that were later modified because of apparent deficiencies. The revised indicators were generally good at monitoring program activities and effects although most of them were incomplete in defining the variables measured. They also did not adequately measure the program's impacts on achieving its food security goals. This obvious lack of integration is a product of inadequate support of monitoring and evaluation in the design and startup phases of the program. A common problem.

Although the baseline data collected and indicators developed for this program were weak in measuring program impacts, all three sectors had strong positive impacts that were easily measured retrospectively by the evaluation team's impact survey (Annex H).

5.1.2. Credit and savings

Common to all sectors was the difficulty households and communities have in acquiring credit or savings to provide sufficient funds to optimally manage their farms, businesses, and water supplies. Developing livestock production and using it as an instrument of savings is a potential solution to this problem and is discussed in the recommendations section.

5.1.3. Market linkages

Market linkages for raw materials (*e.g.*, fertilizers, paddy for processing, pump parts) and products (*e.g.*, maize, honey, *gari*) need to be established and strengthened to assure sustainability of program interventions and to reduce the negative impacts of market fluctuations or to take advantage of them when they occur. This is discussed further in the recommendation section.

5.1.4. Polyvalent trainers effective in adapting to the local needs

The program's strategy of adding knowledge to existing resources is very effective at producing noticeable improvements in food security for all three sectors. To accomplish this OICI uses a field team of Polyvalent Community Facilitators (PCFs), most of whom are highly motivated

college graduates who live and work with the selected groups in the communities. These extension agents promote changes in attitudes in addition to improving their clients' skills in the agriculture, business development, income generation, health, water management, and sanitation. They use participatory approaches to teaching and learning, and use technical materials developed by OICI.

The strategy of targeting people and households with resources and using highly trained field staff to improve upon what they are doing has worked very well. The polyvalent approach is adaptable to a wide range of constraints and opportunities occurring in the field. This allows the agents to respond quickly and at optimum times, leading to better rates of adoption. This strategy can be applied to the development continuum, effectively facilitating the transition from one state or level to the next.

5.1.5. Literacy and numeracy training

In all sectors the low level of literacy and numeracy was surfacing as a constraint to greater program impacts and food security. This appears to be the major barrier preventing subsistence farming from becoming production farming and micro-enterprises from becoming businesses.

5.1.6. Collaboration with government and other organizations

Collaboration with other organizations was a feature in the current OICI program and was documented by numerous signed Memorandums of Understanding (MOUs). Program activities were undertaken in collaboration with various supporting organizations including the Guinea Worm Eradication Program (GWEP) of the Ministry of Health, Ministry of Food and Agriculture (MOFA), Adventist Development and Relief Agency (ADRA), Amex International, and World Vision International Ghana (WVI-G). OICI collaboration efforts in all three sectors were complemented by every organization's representative that the evaluation team interviewed. The best collaboration occurred when the goals and methods were similar and especially when the collaboration was complementary (*e.g.*, contracting with WVI for borehole drilling, supporting MOFA's role of providing agricultural extension).

5.1.7. Building on successes

In every sector the evaluation team saw opportunities to build on program successes and the clients' confidence earned by the extension agents but the lack of funding and authorization prevented following-up with other intervention (*e.g.*, using the guinea worm reduction success as a lead-in for the introduction of more difficult interventions like pit latrines and other sanitation messages). This is a corollary to the above issue regarding polyvalent trainers. Timing can be important, especially for interventions with less dramatic effects or those that are situationally based (*e.g.*, using a drought to show the benefits of soil and water conservation).

5.1.8. Gender issues

The program targeted women for income generation activities but a gender framework was not instituted in the program design. Even though a framework was not instituted the program was able to successfully work through gender issues as they appeared. Part of the program's focus was on improving women's access to resources. The program achieved this and documented a significant increase of women's contribution to household expenses. Women also improved their post-harvest storage and have been assigned roles in community water management. Men appear

to be willing participants in women's empowerment. However there were some complaints expressed by the men who wanted to be a part of the training targeting women. One intervention, yam stakes, was abandoned because the gender issues were too complex for the short period of the program.

5.1.9. Trees

Trees are important source of fuel, construction material, shade, food, and nectar for bees. Their absence in program activities was most noticeable in the micro-enterprise activities but they would also have been complementary to activities in the agriculture sector (*e.g.*, green manure and animal feed) and the water and sanitation sector (*e.g.*, tree nursery sites near water points, building material for latrines).

5.2. Discussion of Cross-Cutting Evaluation Questions

5.2.1. Reaching target clients

Program staff report exceeding many of the program's target numbers of clients and the ones that the evaluation team interviewed were generally enthusiastic. Program staff also report that many more people requested assistance than they can support, in some communities creating resentment. The training messages are well presented and eventually understood through frequent follow-up visits.

5.2.2. Exit strategy

There did not appear to be a clear exit strategy for the program, probably because there remains one more year for implementation. The evaluation team found that there is a great demand for all the program's activities by both participants and non-participants. The program could develop an exit strategy that takes advantage of this demand so that it leaves within each community a local trainers and knowledge of how to pool and access resources to service community needs. For example, we found that many community members are willing to pay for the work and skill involved in building mud silos.

5.2.3. Environmental impacts

All program activities were given negative determinations for possible environmental impacts, some with conditions. No harmful environmental impacts were observed or were likely to have occurred.

5.2.4. Cooperating sponsor collaboration

OICI collaborated well with other cooperating sponsors. OICI's Ghana staff participated in CRS sponsored food security and monetization workshops. This served to increase OICI capacity to manage and implement this DAP. A CRS representative told the evaluation team that CRS and OICI have had a good relationship would like the collaboration to continue.

ADRA is a cooperating sponsor and mentoring organization for OICI on this DAP. ADRA staff in Accra and Tamale that were interviewed by the evaluation team said that collaboration was generally good and that they were willing to continue working together. Minor problems occurred early in their relationship and were resolved. They centered on the role of each organization and

the different methodologies of the two programs. ADRA employs three college educated extension staff that are based in Tamale where they train community volunteers so that they can train others in their communities. In contrast, OICI employs 14 college educated extension staff that are based in the communities they serve. ADRA services many communities through many trained volunteers. OICI services relatively fewer communities than ADRA as a result. The messages delivered to the communities are similar but necessarily different as a result of the different approaches.

Collaboration between cooperating sponsors is likely to be best when each sponsor has clearly defined and separate roles. ADRA and OICI who both do training, but differently, is not an ideal match. However, both should be commended for making their collaboration work. OICI's collaboration with other organization like Technoserve and Heifer International might provide an environment for better collaboration, even with synergistic results.

5.2.5. Sustainability

All the programs activities will be sustainable if during the remaining year (1) relevant market linkages are established and strengthened, and (2) key participants in each community can demonstrate the ability to conduct the activity under likely adverse conditions (*e.g.*, demonstrate ability to diagnose and repair a broken pump). These key participants could serve as ad hoc committee members. For example, the water and sanitation (WATSAN) committees have demonstrated the ability to provide household-level advice in hygiene and sanitation. The training can continue without program support if provided with community handbooks (refer to section 8.3). Similarly OICI could identify key participants for supplemental training and use them as committee members to help assure program participants retain the training provided by OICI and potentially continue the training for other members of their communities.

5.3. Building Institutional Capacity to Implement Title II Food Security Programs

One of the two objectives of the program was to build the capacity of OICI and OICG in technical and managerial capacity for food security programming. This was achieved by training staff in food aid regulations, planning, implementation, monetization, and monitoring and evaluation, sometimes by cooperating sponsors as with monetization training by CRS as described above. The program has allowed OICI to exceed nearly all of its LOA indicator targets. The program has organized 25 skill training workshops for its staff, 62% of it LOA target of 40 and expects to meet the target by the end of the program. The program has exceeded it LOA target of having 25 of its staff participate in food security workshops. To date 28 have participated (112% of the LOA target) and 38 are expected to have participated by the end of the program. All (100%) of the program's staff have scored above 60% on their performance reviews, exceeding the LOA target of 80%. The evaluation team was impressed by the capacity OICI and the capability of its staff. The training materials used are appropriate and state-of-the-art for what they were designed. OICI staff demonstrated good problem solving skills during program implementation and during this evaluation. The evaluation team has no doubts about OICI's capacity to effectively manage future food security programs. Training would be very beneficial to the staff now that they are much higher on the learning curve and have experienced a full program cycle.

OICT's Kumbungu Training Center

Additionally part of the program's capacity building of OICT included the construction of the Kumbungu Training Center. To conform to OICI's management structure OICT has set up a Kumbungu Management Committee to oversee activities. A consultant hired by OICI has developed a detailed marketing plan for the center. OICI has hosted MOFA trainings there and has received several requests from PVOs to use the new facility. The training center appears to be a self supporting component of OICT that will improve its capacity to conduct future food security programs.

6. SUMMARY OF MAJOR FINDINGS

6.1. Agriculture

The program has clearly reduced post-harvest losses with training alone. Data shows that just by improving harvesting and drying of grain losses can be reduced to the target levels of less than 5%. The demonstration and training of mud silos provides households with added protection of their harvest and further assures household food security. The program has also demonstrated that the use of Actellic Super® may not be needed if the other practices just mentioned are followed. A major constraint to improving household availability of food is the difficulty in farmers accessing sufficient funds to optimally manage their farms. The program found ways of providing production credit to it participants but the demand far exceeded the funds and resources that were available. The activities promoted by the program are being replicated by non-program farmer. This by itself demonstrates the success of the program's agriculture sector activities.

6.2. Micro-enterprise

The program's micro-enterprise women are reporting increased incomes and ability to manage their businesses. These women are reporting a significant increase in their contribution to household expenses. Their husbands are encouraging the women to increase their micro-enterprise activities. This suggests major changes in gender roles. Another impressive secondary impact is the increase in child education as a result of greater incomes. Women also report improved household access to food, for example mothers report that they now can give their sons and daughters school lunch money.

6.3. WATSAN

The water and sanitation sector is achieving is objective of improving household access to potable water through construction of borehole wells and education on water treatment. The program's stated objective to improve sanitation has fallen short, mainly because it was not supported in the program design or program implementation with activities and resources to significantly improve sanitation. Nevertheless, compared to other NGOs in Ghana, OICI has excelled in the breadth and quality of water and sanitation support it has offered communities. OICI in cooperation WVI with has set a new standard in well drilling success rates for the Northern Region. OICI has achieved much higher community contributions for borehole well construction than in other communities

in Ghana. OICI has demonstrated that the polyvalent approach is very effective for water and sanitation activities. A government representative of the Guinea Worm Eradication Programme attributes the striking reductions of guinea worm cases in the program communities to the quality of OICI's extension agents and their polyvalent approach. The men and women serving on WATSAN committees with the help of the program have improved household food security by improving food utilization through reduced incidence of diarrheal disease and by improving food availability through reduced morbidity caused by guinea worm.

7. LESSONS LEARNED

7.1. Agriculture

Substantial reductions in post harvest losses are achieved through training about improved harvesting techniques and sanitation practices. **Pesticide use or improved grain storage structures may not be essential** with good management. Mud-silos provide additional protection against the larger grain borer, a storage pest.

The program strategy is to work with households with resources. Even among those selected the **difficulty in households accessing funds constrained the impact** of program activities. The relatively small amount of supplemental resources expended on this constraint had big impacts.

Training alone achieved many of the project objectives. Farmers placed a high value on the program's training program.

7.2. Micro-Enterprise

Low levels of literacy and numeracy are a major constraint to micro-enterprise development.

Communities are willing to support activities **breaking from traditional gender roles** (*e.g.*, bee keeping, cassava mill operation)

Training alone significantly improved women's incomes (*i.e.*, rice processing).

7.3. WATSAN

Given the difficult hydro-geological conditions in northern region **borehole wells are more cost effective than hand dug wells** even though they cost more because they are effective in providing year-round potable sources of water.

The polyvalent, participatory, demand-driven, **OICI approach is more sustainable** than the current system of extension service delivery approach of most programs facilitated by CWSA.

OICI program communities will **contribute 50% more toward borehole construction** than other communities in Ghana (*i.e.*, 1.5 million cedis per borehole compared to the 1 million cedis suggested by the Community Water and Sanitation Agency).

7.4 Cross-Cutting Lessons

A **dependency relationship** between program staff and participants can develop in a short time, especially in communities with an expectation that projects will do things that they could do for themselves. OICI learned early in program implementation to quickly dispel those expectations if they appeared and to hold participants to their commitments.

OICI limited community participants to a maximum of 25 in order to foster participation and cooperation, reduce coordination problems, and assure accountability. However, limiting the number of participants created **rivalry and conflicts** between program and non-program community members.

District Assemblies (DA) work at the grassroots level of development planning, implementation, and local governance. Their participation is essential to the sustainability of NGO programs however **institutionalizing relationships is difficult** because of their wide ranging responsibilities coupled with the limited resources available to them. To help assure sustainability of activities it is necessary that a program's results provide enough incentive for the DA's to become involved. The program design needs to also include methods for building the capacity of the DAs to promote a smooth take over of activities when the program phases out.

Collaboration with other organizations is less problematic for alliances with groups that have similar philosophy, structures, polices, and implementation strategies.

A program is designed based on incomplete knowledge and assumptions so obstacles to achieving its goals are expected, whether due to oversight or events outside the control of the program. Programs need to have **flexible designs and access to supplemental resources** to over come or take advantage of the unexpected. OICI was fortunate to have a Mission that supported needed changes in program activities and to have access to other resources that could be integrated into the program (*e.g.*, USDA funding for production credit).

8. RECOMMENDATIONS

8.1. Agriculture Sector Recommendations

High population levels in some program communities contribute to the misuse of agricultural resources, mainly land and water. This results in low agricultural productivity. Farmer training in **soil and water conservation** techniques for sustainable agricultural production can contribute immensely to curbing rapid land degradation. Also MOFA identifies the need to develop small valley **irrigation** systems for vegetable production in the dry season. This will provide off-season employment for client farmers and other community members. The program should consider including soil and water conservation and small scale irrigation development in future food security programs.

Expansion on **animal traction and rural transport** will help meet farmers' need to reduce labor and access markets.

Increase support of **agricultural production credit** for agricultural chemicals, especially fertilizers. Current market prices are too high to be affordable by the small-scale farmer. **Improving market linkages** can lower cost, improve farmer net profits, and promote food production.

Increase funding of **ICP/ISS program** to help support farmers that follow improved harvesting and post-harvest storage of grains and legumes.

Increase **mud silo construction training** to increase the local availability of skilled builders.

Promote **integrated pest management** to help assure proper and cost effective pesticides use. A special focus could be on reducing the use of dangerous pesticides that are currently being used by promoting alternatives. For example the programs findings that improved harvesting and post-harvest storage can (potentially) eliminate the need for Actellic Super® to reduce losses cause by pests, especially the larger grain borer.

8.2. Micro-enterprise Sector Recommendations

Improve efforts to **assure raw material availability** by assessing production capacity of a micro-enterprise site (*e.g*., cassava and cassava processing) or responding quickly to unexpected demand by helping participant find markets and production credit (*e.g*., paddy and rice processing).

Keep encouraging participants to **invest in micro-enterprises** and investigate the promotion of ancillary enterprises that use the products or byproducts from micro-enterprises (*e.g*., batik and tie and die businesses that could make use of the beeswax).

Investigate and find ways to **expand the market** for micro-enterprise products. For example, cooperative selling of larger orders to distant buyers or development of high value products (*e.g*., clay roofing tiles and/or flower vases).

8.3. Water and Sanitation Sector Recommendations

Find ways for the program to **develop active participation by District Assemblies** and help assure sustainability of water and sanitation activities.

Consider **expanding water and sanitation extension services** by bidding on CWSA and Village Infrastructure Project contracts.

Increase hygiene and sanitation education in the communities and **promote VIP latrine** construction and use. This would make the program conform completely to the national sector strategy.

Prepare and provide a **WATSAN handbook to each community**. The handbook needs to use a very simple and symbolic system for recording WATSAN committee activities. The system should take into consideration, the low level of literacy in the communities.

8.4. Non-Sector Specific and Cross-Cutting Recommendations

OICI staff needs to develop an **exit plan** for the program where participants demonstrate that they can continue the activities without the support of the project[21]. The exit plan also needs to assure that participants develop and strengthen market linkages for raw materials, replacement parts, equipment, buyer and sellers of agricultural products. This may require group field trips for participants to market centers to show them the location of businesses and introduce them to buyers and sellers. Participants that depend on group decisions for their activities may need additional group development and management training to enhance group cohesion and sustainability.

Begin **testing methods and content for future program training and extension activities**. For example the next program could include HIV/AIDS prevention messages in its water and sanitation activities or for all its activities. HIV/AIDS and gender messages might be threatening to participants so they would be better tested in communities that the program knows and where community members trust the program. This testing could develop appropriate messages (*e.g.*, for hygiene and sanitation) and identifying the best audience or composition of the group (*e.g.*, adding a few men to the group can make interventions possible that otherwise could not be implemented because of socio-cultural restrictions).

For future programs consider including activities in all sectors for each community to exploit synergies. Begin testing how to **integrate activities from multiple sectors**, especially livestock production and agroforestry. Livestock production activities can involve more investments and require higher management capability of participants. The project could use demonstrated abilities of participants as a selection criteria. Agroforestry activities may be equally difficult because of potential resource tenure restrictions and because the benefits are not as apparent or immediate. To make agroforestry more effective the activity needs to satisfy multiple demands (*e.g.*, crop fertility improvement, livestock feed, construction material, firewood, and source of nectar). Success with agroforestry activities is more likely in integrated programs. Gender and other socioeconomic issues remain important considerations for achieving desired impacts. The complexity of a more integrated program can be made manageable through specialization and collaboration with other sector specific organizations where OICI's training expertise will be complementary (*e.g.*, Technoserve, Heifer International). With this arrangement it is vitally important the goals, objectives, desired effects, and planned activities are well thought-out and responsibilities are clearly assigned. OICI could start testing livestock and agroforestry activities that will complement each other as well as the existing sector activities, especially agriculture and micro-enterprise. Livestock can be a source of income (*e.g.*, primary and value added products), can also serve as an instrument of savings to purchase agricultural chemicals and raw material, and provide fertilizer for intensive cash crop agriculture. Livestock activities should avoid cattle because cultural restrictions severely restrict the transfer of cattle ownership due to inheritance practices.

[21] Program training indicators were based on attendance (an activity) and not on performance (an effect). This emphasis on training attendance as an indicator may have diverted attention from ensuring participants would be able to continue the activities after the program ended.

OICI could investigate the possibility of using the District Assemblies to promote inter-community contributions (contributions from those communities with boreholes) to pay for borehole well construction in communities (that are neighbors to contributors) that do not have access to year-round potable water. The direct benefit for contributing communities is increased assurance of year-round access of water through sharing of a neighboring recipient community's water when pumps break. This will be a difficult task considering the current level of collaboration between communities but is an opportunity for **promoting a more civil society**.

OICI could provide its **staff training** to build their capacity and to use trainings as a way to retain the knowledge gained by those leaving the program. Experienced staff would benefit from advance training because of the knowledge, experience, and perspective gained from working during a full project cycle. Also training of replacement staff for those moving to other organizations could be conducted before the experienced staff leaves. This will help assure that job-specific project knowledge is not lost.

8.5. Recommendations for Improving Program Design and Implementation

OICI's design and implementation of follow-on programs would benefit from **more clear definition of goals, objectives, and effects** than were developed for this program. The project implementation would be better focused if monitoring and evaluation were based on effects instead of activities. Training is an activity but demonstrating what was taught is an effect. For instance, the number of women trained in business management (activity) and number of new micro-enterprises functioning (effect). This would require frequent follow-up after a training session until the client or group of clients demonstrate the ability to complete the activity on their own. This would also help build in sustainability into project design and implementation. For rare events like pump or machine repair the project could stage tests for clients to demonstrate their ability to diagnose and fix a problem.

Do not use a participatory rural assessment to establish a baseline unless the assessed population will be representative of the population of project clients. Consider **establishing household baselines at the time of participant recruitment**. This will allow easier household based progress and impact evaluation and allow better time and condition based predictions of post project impacts. Intake questionnaire design and testing needs to occur before indicators and targets are finalized.

The program's design could **base targeting of participant and households on self selection and performance**. This could be structured to open participation to all members in the community but the program could set qualification criteria narrow enough to reduce the number of participants for those activities that require high levels of program support. This will assure that the demand on project resources is manageable. This open, transparent approach can lead to self selection of participants, potentially reducing competition and rivalries between community members over project resources. It would also help distance the program for these conflicts if they emerge.

Mentioned above, the OICI could **collaborate with organizations with complementary activities**. For example, Heifer International Ghana has considerable experience in livestock production promotion in the southern parts of the country is interested in extending its interventions to the Northern Regions. OICI could benefit from their experience with livestock and Heifer International can use OICI's knowledge of program participants to better target recipients of livestock. Through collaboration both organizations can be much more effective.

8.6. Recommendations for Including Food for Work or Direct Distribution Components in Future Program Design

Short of a major crop failure, the team is wary of recommending any food for work or direct distribution for future program designs that are based on activities and training like those conducted during this program. One reason is because it would send a mixed and confusing message to participants who are being trained and encouraged to produce more food or add value to food products. A certain level of food insecurity can help the program promote positive behavior changes.

Activities that might be appropriate for food-for-work (if cash-for-work is not an option) are rural infrastructure development projects such as road rehabilitation or maintenance, and bridge building. These activities could help improve rural community's access to markets and health care.

A potential activity for direct distribution is providing food to HIV/AIDS affected households. If the number of HIV/AIDS households are large enough then special training activities along with food could be provide to affected household members. The goal would be to provide support to affected households so that customary safety-nets in communities are not over taxed to the point that affected household members migrate to cities. Also the activity could assure that the survivors, especially the children have the means to continue productive lives with inherited assets.

ANNEX A. EVALUATION SOW

SCOPE OF WORK

For the

FINAL EVALUATION

Of the

OICI Ghana P.L. 480 Title II Program
Food Security Training and Outreach Services Initiative
(1999-2003) [22]

1. INTRODUCTION

The Food Security Training and Outreach Services Initiative – a P.L. 480 Title II Development Assistance Program (DAP) with the United States Agency for International Development (USAID), aims to improve food availability, access and utilization among target farm households in the Northern Region of Ghana. This will be achieved through training in post-harvest processing and storage, women's enterprise development and training in agro-processing, the provision of community water wells and training in well maintenance and sanitation. Additionally, the 5-year program aims to strengthen the organization's technical and managerial capacity in the area of Title II food security programming.

The Opportunities Industrialization Centers International (OICI) plans to submit to USAID a follow-on DAP for FY 2004-2008 in the first quarter of FY 2003. In order for OICI to incorporate the lessons learned from the current DAP in the new proposal, a Final Evaluation has to be conducted in the last quarter of FY 2002. This is one year earlier than projected in the Detailed Implementation Plan presented in the original proposal, but necessary to ensure the continuity of resources and smooth transition between DAPs.

1.1 Objective of the evaluation

The objective of the evaluation is to provide an external and impartial assessment of the results achieved by the program focusing on population-level impacts, establishing plausible links between inputs and impacts. Further, the evaluation will document lessons learned to serve as tool to strengthen the design and implementation of a follow-on DAP, as well as other development programs in the Northern Region.

1.2 Description of the program

1.2.1 Goal, Strategic Objectives and Intermediate Results

The goal of the OICI Title II program in Ghana is to increase food security among target populations in the Northern Region of the country through interventions that impact on the availability, access and utilization of food. Specific development activities are expected to contribute towards the goal. Training of target farmers in post-harvest processing and storage,

[22] Adapted from FANTA Technical Brief No. 2: Title II Evaluation Scope of Work, March 2002.

and construction of improved storage structures are expected to reduce crop production losses and therefore increase food availability. Food access meanwhile is promoted by increasing women's potential to earn income by providing technical skills and equipment in various agro-processing activities *e.g*. improved pottery production, rice processing, cassava processing, honey and beeswax production. Finally, the provision of potable water wells, well maintenance and sanitation training is expected to enhance food utilization by reducing the incidence of water-borne diseases.

1.2.2 Brief description of key intervention and implementation strategy

The key intervention provided by OIC is training, conducted by Polyvalent Community Facilitators (PCFs) and/or other professional trainers to community farmers and women groups organized by the program. The training interventions are complemented by the provision of key agricultural inputs such as improved planting materials/seeds, pesticide, grain silos and/or storage structures; improved agro-processing technologies such as the use of cassava graters, screw press and other equipment such as potters wheel, firing kiln, and bee hives and community borehole fitted with hand pump and furnished with concrete soak-aways.

1.2.3 Geographic coverage of the program

As of June 2002, the program covered 141 communities in 7 districts of the Northern Region, namely Savelugu-Nanton, Tolon-Kumbungu, Gushiegu-Karaga, Yendi, West Gonja, Saboba-Chereponi, and Tamale Rural. Specific interventions are targeted at selected communities based on selection criteria established by the program management. Therefore not all interventions are present in all communities.

1.2.4 Description of key partners and how activities are coordinated

Key Partner Organizations	Activities
Catholic Relief Services (CRS)	CRS being the Monetization agent in Ghana, acts as the lead in the development of a monetization plan for all CSs including OIC for approved commodity and present it to the coordinating committee for approval.
World Vision International (WVI)	WVI brings its several years of experience in well drilling in the relatively difficult geological formations in the Northern Region, to bear on OICI/OICG's efforts in the area of provision of potable water wells to OIC target clients; provides OICI concessional rates for the cost of drilling.
Ministry of Food and Agriculture (MOFA)	MOFA being the statutory government agency responsible for the development of agriculture has released its existing storage structures to OICT to be used for the implementation of an Inventory Credit Program to enhance the marketing of agricultural produce; possesses the technical know-how in the dissemination of information on improved storage structures (mud silos).
Guinea Worm Eradication Program (GWEP) of Ministry of Health	GWEP as the statutory government institution under the Ministry of Health has been making consistent efforts in reducing the incidence of guinea worm and other water related diseases in Ghana over the years. It provides OICT with water filters and posters for distribution to OICT and GWEP target communities. It also provides technical assistance to OICI in the development of appropriate training materials for communities.

Center for Agriculture and Rural Development (CARD)	CARD is a local NGO with rich experience in community mobilization. It has mobilized beneficiary communities to contribute towards the construction of community storage structures being promoted by OICT and links OICT storage structure provision with inventory credit scheme for maize/grain marketing.
Adventist Development and Relief Agency (ADRA)	ADRA is a sister Cooperating Sponsor funded by USAID. ADRA has rich field experience and huge development constituency that demand OIC's training services to complement ADRA's efforts in silo provision and community water and sanitation training. ADRA works with OICT in selected three districts (Tolon/Kumbungu, Savelugu/Nanton and West Gonja districts) in the Northern Region to enhance food security of target clients.
District Assemblies (DAs)	The DAs are the lead government statutory agencies with the mandate to oversee the overall physical development of the districts. OICT involves the decentralized departments of the DAs in the selection of beneficiary communities/clients as well as sharing of program documents and other information which are of mutual benefit to both OICT and the DAs.

1.2.5 Implementation history and issues to date

OIC Tamale (OICT) was launched in 1999 as a food security program utilizing resources from 100% monetization of PL 480 Title II commodities in Ghana. OICT is a partnership program between OICI and its affiliate, OIC Ghana (OICG), with OICI as the lead Cooperating Sponsor and OICG a Recipient Agency. OICI envisions that the OICT program will devolve to OICG at the expiration of PL 480 funding, hence the built-in institutional capacity-building interventions under the current DAP.

The program started to receive monetization proceeds in May 2000, nine months into the first fiscal year. As a result, there was considerable setback in program startup as the bulk of FY 1999 resources was received in FY 2000. Due to the consortium arrangement with other Cooperating Sponsors in Ghana, monetization proceeds are received from every call forward made throughout the year, and distributed proportionally across all consortium members. During FY 2000, the Ghanaian Cedi (GHC) suffered its worst drop in history (from 2,900 to 6,500 GHC to 1 USD from October 1999 to September 2000), which has decreased the amount of resources available to the program. Because of the local currency depreciation and domestic inflation, OICI scaled back program targets as reflected in the last Cooperating Sponsor Results Report and Resource Request (CSR4) submitted to USAID on 25 April 2001.

A Midterm Evaluation was conducted in November-December 2001 by a 4-person evaluation team led by Dr. Mark Langworthy of TANGO, using focus group discussion, field-level interviews and review of key program documents.

1.3 Brief description of how the program fits into the mission and local government's strategies and priorities

There have been conscious attempts by various successive governments of Ghana, NGOs, groups and few individuals to fight poverty and its associated food insecurity in the country. Food insecurity in the 3 northern regions of Ghana (Upper East, Upper West and Northern Regions)

however, remain the most serious problem compared to other regions of Ghana, hence the presence of many development organizations in these regions. They work in the areas of agricultural extension services, credit, infrastructure development, child survival, health and nutrition, agro-forestry and primary education.

OICI/OICG therefore by targeting the most food insecure households in the Northern Region for its development activities have fulfilled its mission of assisting the most vulnerable in the society and supporting government's efforts to improve standard of living in the country and the Northern Region specifically.

The training provided by OICI/OICG in post-harvest loss techniques, marketing and basic business management skills as well as the construction of household and community storage structures will help improve household food availability. The construction of community potable water sources coupled with training in pump maintenance and sanitation will also meet the target population's need for clean and safe water sources. Target women are also being assisted to diversify and augment their income through training in beekeeping, cassava processing, pottery-making and rice processing. All these activities will complement government poverty reduction strategy in the region.

The program's agricultural activities also directly fit within the Mission's objective to increase the marketed value of agricultural products. Specific intermediate results addressed by the program include increased use of improved production practice, improved management, improved post-harvest handling, and increased information dissemination. The program also complements the Mission's sub-goal, which is improved productive capacity of Ghana's workforce, specifically of those in the agricultural sector, by providing access to potable water. This intervention indirectly contributes to rural productivity in terms of improving health, reducing illnesses, and providing more productive work hours for adults and children.

2. EVALUATION TEAM COMPOSITION

The evaluation team will be composed of the following:

a. Team Leader – an expatriate international development and evaluation specialist with experience in West Africa, preferably Ghana, with skills to assume the overall management responsibility of the evaluation (*e.g.*, working with OICI on logistics, insuring that all team members fulfill their obligations, organizing and directing team interaction, planning a final in-country debriefing and workshop/meeting, etc.). The Team Leader must be skilled in articulating the different technical viewpoints of other team members, including statistical analysis, and will be responsible for the quality of the final evaluation report which shall have both qualitative and quantitative data to support findings.
b. Agricultural Specialist – a local agricultural expert with requisite skills and experience in Northern Region agricultural systems, preferably with background in post-harvest technologies as well as understanding of agricultural marketing and project impact evaluation methodologies.
c. Microenterprise Specialist – a local microenterprise specialist with requisite background and experience in organization of women's groups, particularly in the Northern Region, and understanding of agro-processing technologies, profit-making community-based microenterprises, and project impact methodologies.
d. Water and Sanitation Specialist – a local community water and sanitation expert experienced in the implementation and evaluation of rural community water projects including community mobilization in the Northern Region.

3. TEAM AND INDIVIDUAL TEAM MEMBERS SCOPE OF WORK AND EVALUATION QUESTIONS

3.1 Impact survey

An impact survey will be conducted and the data summarized *before* the evaluation team arrives in the field so that the results will be available to the team during the actual evaluation. OICT field staff will conduct the survey with guidance from the Team Leader. The Team Leader will direct the staff with regards to the design of the questionnaire, the sampling methodology, and the processing and presentation of collected data.

3.2 Evaluation methods

The evaluation team will use the impact survey data to provide quantitative as well as qualitative measures of final program impact. Although the emphasis of the final evaluation report will be in the analysis of quantitative data, further qualitative assessments will be provided through rapid appraisal methods such as focus group and key informant interviews, direct observation through site visits, and review of key program documents. Other strategies for data collection and analysis will be left open to the evaluation team to provide flexibility, however, the methodology will have to be submitted and approved by OICI prior to adoption.

3.2 Evaluation questions for the overall team and the Team Leader

The Team Leader, together with other team members, will answer the following questions. The list, including those in the specific technical sectors in the succeeding sections, is not exhaustive, and may be expanded during the course of the evaluation.

- Design, Implementation and AchievementsAre planned activities appropriate for the food security problems identified in the target areas? Does the framework, assumptions and design match the local food security conditions?
- How effective is the program at reaching target clients?
- Has the goal of increasing food security among target populations in the Northern Region been met?
- What interventions have been more or less successful in meeting targets and why?
- What improvements can be/could have been made to the design in order to improve results?
- What improvements can be/could have been made in the implementation of the program in order to improve results?
- What are unexpected but important benefits or impacts of the program that should be recorded?
- What are negative impacts or unintended consequences of the program that need to be addressed, and how?
- What are the prospects for including a Food for Work or direct distribution component in a follow-on DAP?

Behavior Change

- Are clients adopting desired practices or behaviors?
- Which practices have clients been more inclined to adopt, and why?
- Which practices have clients been more reluctant to adopt, and why?
- Are there certain groups within the population with lower rates of adoption and why?

- How can a follow-on program address these constraints to adoption?
- Is the client to field staff ratio and frequency of contact adequate for the type of behavior change envisioned in the DAP?

Capacity Building
- Are the training materials appropriate – tailored to the user, accurate and state of the art? Which materials need strengthening, if any, and how?
- Is the program effectively developing the capacity of OICT and OICG to manage food security programs? To what extent has the capacity been enhanced through partnerships with CRS and ADRA? If not, how could the design or implementation be altered to improve capacity building?
- Is the program effectively enabling, or developing the capacity of clients? If not, how could the design or implementation be altered to improve capacity building?

Sustainability
- Are the program impacts (increase in net yields, incomes, food utilization) sustainable?
- Are clients likely to continue adoption of better practices after the program ends? Which outcomes related to adoption of better practices are likely or unlikely to be sustainable, and why? What can be done to increase sustainability?
- Does the program have a community exit strategy? Has OICI been able to exit successfully from any of its communities?
- Has OICI moved forward to initiate some aspects of the strategy to turn over the program to local management?
- Has the program effectively collaborated with local administrative bodies such as ministries, local councils, etc? Has the program effectively collaborated with other development organizations? How does the program strengthen or expand the capacity of these entities? What concrete actions have they taken as a result of program interventions? Will they be able to maintain this capacity once the DAP ends?

Monitoring and Evaluation/Reporting
- Overall, did the program achieve its targets? If not, why not? (Provide an analysis of the Indicator Performance Tracking Table).
- Were the established targets reasonable given the program context?
- Were M&E data and anecdotal information used for management purposes? Were they shared with communities or clients? With other organizations in the area?
- Is the established M&E system effective?

3.3 Evaluation questions for the Agriculture technical sector

The Agricultural Specialist will have primary responsibility in answering the following questions:
- Which specific targets related to agriculture were achieved? What were success and limiting factors?
- Did agricultural interventions result in increased production and household food availability?
- Have farmers adopted whole technological packages or just components and why?
- Are the technologies and practices being promoted well established and appropriate to the local agro-ecological environments?
- Are farmers able to obtain improved and recommended inputs without program assistance (free or subsidized inputs)? If not, what would be required in order that they could do so?

- Are farmer and other community groups able to maintain new productive infrastructure on their own? If not, why and what could be done to address this limitation?

3.4 Evaluation questions for the Microenterprise technical sector

The Microenterprise Specialist will have the primary responsibility in answering the following questions:

- Which specific targets related to microenterprise were achieved? What were success and limiting factors?
- Are the technologies, practices and training being promoted appropriate to the target communities?
- Did microenterprise interventions result in increased knowledge of business and business plans?
- Did microenterprise interventions result in increased household incomes?
- Is there an accessible market for the products or services produced by the microenterprises?
- Are these microenterprises likely to remain in operation after the DAP terminates? If not, why and what can be done to enhance their sustainability?

3.5 Evaluation questions for the Water and Sanitation technical sector

The Water and Sanitation Specialist will have the primary responsibility in answering the following questions:

- Which specific targets related to water and sanitation were achieved? What were success and limiting factors?
- Are communities using the borehole wells? If not, why not?
- Are communities able to maintain the borehole well and pumps on their own? If not, why and what could be done to address this problem?
- What improved sanitation practices have been adopted by recipient communities?
- Are the technologies, practices and training being promoted appropriate to the target communities?
- How have the wells contributed to household food security? Can plausible links be established between improved access to potable water and sanitation and improved food utilization?

3.6 Performance and Program Information Sources

Performance data and information on the program are in the following documents:

1) Food Security Training and Outreach Services Initiative Development Activity Proposal
2) Baseline Survey Report
3) FY 1999 Annual Results Report
4) FY 2000 Previously Approved Activity (PAA)
5) FY 2001 Previously Approved Activity (PAA)
6) FY 2000 Results Report and FY 2002-2003 Resource Request (CSR4)
7) FY 2001 Results Report and FY 2003 Resource Request (CSR4)
8) Semi-Annual Portfolio Review Reports (SAPRs) to USAID/Ghana
9) Performance Monitoring and Evaluation Plan
10) Monitoring and Evaluation Reports
11) Program Monthly Reports
12) Midterm Evaluation Report
13) OIC Tamale Training Materials

14) Feasibility Study on Potable Rural Water Supply Systems in the Northern Region
15) Feasibility Study on Cereal and Legume Storage Systems in Northern Region
16) Memoranda of Understanding and Program Agreements with local partner agencies
17) FY 2002 and FY 2002 A-133 Audit Reports

4 DELIVERABLES

The Team Leader will be responsible for producing the draft and final reports to be submitted to OICI in Philadelphia in electronic form using MS Word. A first draft should be submitted electronically to OICI both in Philadelphia and Accra by Wednesday, 4 September 2002. Five (5) single-sided hardcopies of the final report will be required, in addition to the electronic files, by 20 September 2002. It is suggested that the report include true-to-life quotes, anecdotes, short case studies and photographs to enliven the report.

The following outline is suggested for the final report –

Title page with date
Executive summary
Table of Contents
Introduction
- Objective of SOW
- Brief description of program
- Complementarity with USAID and GOG strategies and priorities
- Significant challenges faced in program implementation
- Overall assessment of program goal achievement

Agricultural sector
- Brief description of interventions
- Achievement of results
  - Meeting targets
  - Other achievements
- Challenges
- Discussion of other agricultural evaluation questions

Microenterprise sector
- Brief description of interventions
- Achievement of results
  - Meeting targets
  - Other achievements
- Challenges
- Discussion of other microenterprise evaluation questions

Water and Sanitation sector
- Brief description of interventions
- Achievement of results
  - Meeting targets
  - Other achievements
- Challenges
- Discussion of other water and sanitation evaluation questions

Cross-cutting issues
- Brief description of cross-cutting issues
- Discussion of cross-cutting evaluation questions
- Building institutional capacity to implement Title II food security programs

Summary of Major Findings

Lessons Learned
Recommendations
- Agriculture sector recommendations
- Microenterprise sector recommendations
- Water and Sanitation sector recommendations
- Non-sector specific and cross-cutting recommendations
- Recommendations for improving program design and implementation
- Recommendations for including Food for Work or direct distribution components in future program design

Annexes:
- Evaluation SOW
- Composition of the team
- Evaluation Methods
- List of sites visited
- List of key informants
- References
- Indicator Performance Tracking Tables
- Survey tools
- List of Acronyms
- Others

5 TIME FRAME

Activities of the evaluation team in the field will be completed within a maximum period of 3 weeks, excluding time allotted for the impact survey, which will be conducted by OICT staff. The Team Leader will be contracted for 28 person days, while the rest of the evaluation team will be contracted each for a maximum period of 21 person days.

The following is a tentative schedule of activities. The Team Leader will develop a detailed time schedule for the evaluation team.

Schedule		**Activity**
Week #	**Date**	
1		Document review
1		Design of survey questionnaire
2-3		Pre-test and conduct of impact survey in the field
4		Processing of collected data
5	11 Aug	Arrival of Team Leader in Ghana and meeting with evaluation team
5-6		Field work of evaluation team
7		Data analysis and report writing.
7	31 Aug	Team Leader departs Ghana.
8	4 Sep	Submission of first draft.
9		Report writing
10	20 Sep	Submission of final report

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ANNEX B. COMPOSITION OF THE TEAM

Team Leader: Joe Tabor (M.S., M.P.H.) is an expatriate international development and evaluation specialist with over 20 years of experience in natural resource management, agriculture, and public health in North America, Caribbean, Africa, and Asia. Experience includes the disciplines of agronomy, pedology, forestry, ecology, and epidemiology. Analytical skills include statistical analysis, GIS, satellite image processing, and household survey techniques. He can be contacted at jtabor@ag.arizona.edu.

Agricultural Specialist: Gordon K. Ekekpi (M.Phil.) is a local agricultural expert with over 25 years of experience and experience in Northern Region agricultural systems. Mr. Ekekpi has worked with government institutions in advisory capacity in the formulation and review of national agricultural policies, design and management of agricultural programs at the Regional and Sub-regional levels. He has provided technical assistance to various district and regional agricultural directorates of government. He has been involved in various agricultural research studies including program design, implementation and impact evaluations including that of international development NGO partners. He has been involved in co-ordination of MOFA HIV/AIDS and gender mainstreaming program activities.

Microenterprise Specialist: Charles Nornoo (M.Phil.) is a Ghanaian development practitioner with over 11 years experience working with medium, small and micro-enterprises in West, East and Southern Africa for multilateral, bilateral, and national institutions. Until June 2001, Charles was the Program Manager for TechnoServe Ghana. He has proven skills in development planning, business plan preparation, design of baseline and field surveys; data collection and analysis; industry/sub-sector analysis; project analysis (from formulation to evaluation); project financing; designing viable credit programmes (micro-finance); produce marketing; gender analysis; growth linkages; small and micro enterprise development; and environmental impact assessment. He can be contacted at bds@africanus.net.

Water and Sanitation Specialist: Francis Mawuena Dotse (M.D.S.) the Managing director of MAPLE Consult, is a Ghanaian community water and sanitation expert with over 29 years of development experience in Ghana. For the past 11 years, he has operated at very senior levels in the rural water supply and sanitation sector. He has managed water and sanitation projects for UNDP and KfW (of Germany). He has been involved in the evaluation of water and sanitation programs for DANIDA in 1995, 1999 and 2001 as well as for DFID in 2000 where he was team leader. He is currently involved in the implementation of water and sanitation projects in the Greater Accra, Eastern/Ashanti and Northern Regions being funded by DANIDA, KfW and the European Union, respectively. Previously a Senior Lecturer at the Ghana Institute of Management and Public Administration (GIMPA), he has extensive knowledge and expertise in Ghana's decentralization process and its local government system. He is a member of the Kpando District Assembly where he is the chairman of the Development Planning sub-committee. Mr. Dotse has undertaken assignments for other international agencies such as the World Bank and UN Habitat.

ANNEX C. EVALUATION METHODS

The findings of this evaluation were based on the convergence of evidence gathered from multiples sources. The evaluation team gathered relevant information using rapid appraisal techniques (*i.e.*, focus group and key informant interviews, direct observations during site visits), a household impact survey, and document review (*e.g.*, Baseline Study Report, CSR4s, program monitoring data).

An impact survey was developed by the evaluation team *after* their arrival to Tamale. In July 2002 OICT staff conducted an impact survey (Amevor & Donkoh, 2002) on current attitudes and conditions of its program clients. OICI/G staff and the Team Leader decided to conduct a second impact survey to measure program impacts that were not addressed in the July study. This survey was administered by OICT field staff concurrent with the final evaluation field work (Annex H). The results were analyzed after the evaluation field work and the finding were incorporated into the final draft of this report.

At the beginning of field work the Team Leader and Micro-enterprise Specialist met with representatives from USAID, CRS, and ADRA in Accra (August 12-13) before traveling to Tamale. The team reviewed the TOR with OICT office staff and developed a plan for conducting the evaluation and impact survey. Each consultant developed a list of questions and topics to guide discussions during focus group and individual interviews of OICT clients during site visits. This list was developed from the "Evaluation Questions" listed in the TOR.

The team met with OICT extension agents (Polyvalent Community Facilitators) during the training session on administering the impact survey. Together the evaluation team and extension agents identified communities to visit and schedule meeting times so that the extension agents could set appointments with community committees and representatives of District Associations. Communities were selected both randomly and on the advice of program extension agents for each sector. The mixture of purposeful and random sampling of communities allowed the team to evaluate the full range of program impacts as well as to maintain a balanced view of those impacts. The three sector specialists planned and conducted four days of community interviews (August 21-24). In order to use each consultant's time efficiently, the evaluation team split into three groups with separate vehicles. This was required because the program selected many of communities for sector specific interventions. The team met each evening to discuss the day's findings and any cross-cutting issues. The Team Leader accompanied each sector specialist on some of their community visits.

The team drafted the report together in the same office to help stimulate discussion and efficiently share information. The OICT staff was briefed on the evaluation teams finding and were provided draft sections that were reviewed for accuracy. OICG and USAID were also briefed on the teams finding and suggestions were noted for inclusion into the final report. A second draft of the report was prepared by the Team Leader in the US. This draft included results of the impact survey. This draft was distributed via e-mail to the consultants for including finding and interpretation based on the impact survey and to OICI staff for review for accuracy and correction of errors. The final draft was edited by the Team Leader and submitted to OICI, Philadelphia USA.

ANNEX D. LIST OF SITES VISITED

Communities Visited and Sector Information Collected (August 21-24, 2002)
Bagurugu, Agriculture
Busunu, Agriculture, Microenterprise, Water & Sanitation
Cheyohi, Water & Sanitation
Damdu, Agriculture
Dugshegu, Microenterprise
Fazihini, Microenterprise
Gbambu, Water & Sanitation
Gbayong, Microenterprise
Gbirima, Water & Sanitation
Gbullung, Agriculture
Gushegu, Water & Sanitation
Jakariyilli, Microenterprise
Kangbagu, Agriculture
Kanshegu, Agriculture, Microenterprise
Kawankura, Agriculture, Microenterprise
Kipilo, Agriculture
Kumbungu, Microenterprise
Kusawgu, Agriculture
Laanga, Agriculture
Logshegu, Microenterprise
Naprisi, Water & Sanitation
Nyong-Nayili, Agriculture
Sahanayilli, Water & Sanitation
Sankpala, Microenterprise
Savelugu, Water & Sanitation
Tailorpe, Water & Sanitation
Tali, Agriculture, Water & Sanitation
Tindang, Microenterprise, Water & Sanitation
Tolon, Water & Sanitation
Wambong, Agriculture
Yangu, Agriculture
Yiborgu, Agriculture
Zagyuri, Microenterprise
Zantele, Agriculture
Zori-Yapala, Water & Sanitation

ANNEX E. LIST OF KEY INFORMANTS

Date	Organization/Location	Name	Job Title
12-Aug	CRS-Accra	Augustina Addae	
13-Aug	USAID Mission to Ghana	Sharon Cromer	Director
		Andrew Krefft	Food For Peace Officer
		Roger Lapp	Assistant Controller
		Thomas Asare	Financial Analyst
		Jemima Tettey-Cofie	Program Assistant
		Adeline Ofori-Bah	Agricultural Economist
		Fenton Sands	Private Sector Office Chief.
13-Aug	ADRA-Accra	Mildred Taylor	Program Manager
		Vincent Djarbeng	Coordinator, Agric & Natural Resources
		Victoria Darko	Coordinator, Health, Nutrition, Water & Sanitation
19-Aug	Ministry of Health – Guinea Worm Eradication Program	Emmanuel Kanjo	Project Officer
		Anthony Gingong	
20-Aug	ADRA-Tamale	Samuel Woode	Field Project Officer: East Gonja, Nanumba, Saboba/Chereponi
		Elvis Agyei	Credit Officer
		Adu Boahen	Credit Officer
		Mrs. Eunice Odum	Health /Nutrition Coordinator for Northern Ghana
		Ochere Boadu	Field Officer for Tolon,Savelugu & West Gonja
20-Aug	CARD	Naresh Shukula	Program Manager
20-Aug	World Vision – Ghana	Stephen Ofosu	Water Res.
		Patrick Amoateng	Project Manager
		Amponsah Mensah	Acct. Mgr.
		Carl Ofan-Aguyeman	Operations Mgr.
		Jarvis Abonang Ayamsegna	Water Quality Manager
		Angelina Nhirakwah	Adm. Assistant
20-Aug	Technoserv-Tamale	Christopher Bakawerei	Sr. Business Advisor
		Joseph Banikon	Regional Accountant
		Raman	Business Advisor

21-Aug	Ministry of Food and Agriculture	Sylvester Adongon	Regional Director of Agriculture – N/R
		Robert Dodoo	Livestock Specialist
21 Aug	Gushegu/Karaga District Assembly	Ms. Rita Iddi	District Chief Executive
		Mr.Abdul Karim Adam	District planning Officer
22 Aug	West Gonja District Assembly	Mr. Zakaria Yakubu	District Chief Executive
		Mr. H. Banda	District Coordinating Director
30-Aug.	USAID-Ghana Mission	Alexander Newton	Deputy Mission Director
		Andrew Krefft	PL Title II Program Officer
		Adelaide	
		Jim Wright	
30-Aug.	Heifer International – Ghana	John Heloo	Country Director
30-Aug.	TechnoServe – Ghana, Accra	Nick Railston-Brown	Country Director
		Scott Clark	Program Director
	OICI-Ghana	Leon Sakho	Interim Country Director
		Carla Denizard	Country Director
		John Azu	Technical Advisor
		Francis Kotobridjah	Finance and Monetization Advisor
	OICI-Tamale	Isaac Gyamfi	Project Manager
		Florence Pul	Technical Services Coordinator
		Samuel	Agric. Technical Specialist
		Osman	Micro-enterprise Technical Specialist
		Patrick	WATSAN Technical Specialist
		Paul Amevor	M&E Specialist
		El Haj. BA Fusseini	Board Member
		Fati Paul	Board Vice-Chairperson
		Nurideen Moomen	Executive Board Member

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ANNEX G. INDICATOR PERFORMANCE TRACKING TABLES

Note the strike-through entries have been amended or deleted. They are included for a historical perspective.

(INSERT 3 PAGES FROM EXCEL FILE)

ANNEX H. IMPACT SURVEY

A. Introduction

This impact survey was conducted as part of the final evaluation of OICI's Food Security Training and Outreach Services Initiative Development Activity Proposal. OICI/G staff and the evaluation team leader decided to supplement the impact survey conducted by Amevor & Donkoh (July 2002) in order to measure impacts not addressed in the July study and the program's monitoring and evaluation program. This survey was administered by OICT field staff concurrent with the final evaluation field work. The results were analyzed after the evaluation field work was completed. Interpretation of the finding were incorporated into the main text of this final evaluation report.

The program is starting its fourth and final year of field activities. Currently program activities occur in 141 communities located in seven Districts of Ghana's Northern Region, however only 87 communities have participated in program activities longer than a year. These communities provided the population on which program impacts were evaluated.

B. Baseline study

The baseline study was not used for the impact study because its population was not representative of the program's participants. It also did not address some of the impact variables. The baseline survey (Asuni, 2000) contracted by OICI was administered February 23-28, 2000 by paid interviewers and followed a participatory rural appraisal approach. The interviewers were accompanied by program extension agents (PCF) to train the PCFs in survey research techniques and helped them understand and integrate into their assigned communities. The objectives of the survey were to (1) provide baseline values of key indicators (2) provide information for reassessing target objectives for the program and (3) identify any factors that might influence program activities. The survey was conducted in first three of the seven districts OIC selected for program activities. Households (n=322) were the primary sampling unit. A household was defined as the people who live together and eat from a common pot. Half of the survey households were randomly selected from ADRA's lists of program participants. The other half were named "controls," and were selected based on their distance from ("third house beyond") the selected ADRA participant households. Approximately 11% of the households in 28 communities were interviewed. Baseline information was not collected for 13 of the impact indicators identified in the DAP (indicators 1.1.1, 1.1.3, 1.1.4, 1.1.5, 1.2.1, 1.2.2, 1.3.2, 1.3.3, 1.4.1, 1.4.2, 1.4.3, 1.5.1, and 1.5.2; OICI, 1998a&b and Annex G.). Eight of these indicators may have been interpreted as program output (activity) indicators with baselines of zero. The lack of baseline information on these indicators makes attribution of impacts from this program more speculative since DAP participants might also have received training and support from other programs. For example, Asuni (2000, p. 18) noted that a "large percentage (45%) of women interviewed earn money through processing agriculture products." These women run business were classified as micro enterprises but no questions were ask about past business training they may have received.

C. Survey Design

The evaluation team designed the impact questionnaire; each consultant was initially responsible for developing questions to evaluate program impacts in their assigned sector, especially those

not directly measured by the program's monitoring and evaluation section. The questions were review with the program's extension agents (PCFs). As a result some questions and sets of questions were modified to be more culturally appropriate.

We used the same definition of household as the baseline survey and included some of the its questions so that the baseline data could be used to help validate some of the impact survey questions and be used to compare results from communities common to both surveys. However the essential baseline data could not be found to validate the impact survey. Data entry of the baseline questionnaires was contracted out. The questionnaires were not retained by the program and the names of the interviewees were not recorded in the database. If the baseline data can be retrieved it can be used to assess the validity the impact study questionnaire and impact analysis of those communities with the same interviewees.

Due to time constraints the survey was not pre-tested, we expected that baseline data would be available to validate many of the questions. The questionnaire were not translated into local languages, however the extension agents and the evaluation team thoroughly discussed each question so that all the extension agents/interviewers would clearly understand the intent of each question.

D. Selection of Interviewees

The program maintained a database of participants. This data allowed us to select interviewees probability proportional to size within each activity stratum. A total of 2441 participants were identified as having been with the program longer than a year. The program generally concentrated on one activity in each of their participating communities. We stratified the selection of communities based on activities (*i.e.*, agriculture, water & sanitation, cassava processing, rice processing, bee keeping, and pottery making). We then selected up to 5 communities in each activity strata, only 4 communities in rice processing and 3 communities in cassava processing had participants that were active for more than a year. From the 6 strata, 27 communities were randomly selected probability proportional to the number of participants in each strata. Because some communities have more than one program activity some activities were better represented by selected interviewees. For each of the 27 selected communities a list of up to 20 randomly selected participants was made. The interviewers selected the first 8 participants on the list that were available and willing to be interviewed. Five control communities were also selected to compare program participant responses with people residing in non-program communities. One control community was selected from each district based on similar size and close proximity to a randomly selected impact survey community (n=27). Household compounds in Northern Region communities are numbered so a randomized list of numbers from 1 to 50 was provided to the interviewers for each assigned control community. The interviewer selected from the randomized list the first 8 compounds with people that were available and willing to be interviewed. Some compounds are composed of more than one household so an additional list of randomized numbers was provided so that the interviewer could randomly select households within the same compound. A total of 216 qualifying program participants were interviewed out of a possible 2441. A total of 40 non-program community households were interviewed for controls, 8 households form each of the 5 regions.

E. Survey Implementation

The program extension agents (PCFs) are college graduates and had experience conducting the baseline and other surveys (Asuni, 2000; Amevor & Donkoh, 2002). The one day of training and discussion about survey implementation was all that was available but seemed sufficient

considering the capability of the PCFs. Impact study was conducted by PCFs from 21-28 August 2002. They reported that the interviews required an average of 20 minutes to administer.

F. Data Entry

Epi Info 6.04 software program was used for the data entry. A template was developed and 4 data entry clerks, graduates of University of Development Studies in Tamale were contracted to enter the data. The data was merged and cleaned by programs monitoring and evaluation specialist and sent to the team leader of the evaluation team for further cleaning and analysis.

G. Data Analysis

The household data on types of crops grown were consistent among the communities sampled, within and outside the program; therefore it was assumed that the population was relatively similar across strata. Descriptive statistics and comparison of means using MS-Excel (ver. 2002) and odds ratios were calculated using Stata (ver. 5.0).

H. Results

The results are reported and interpreted in the main report. OICI was provided the raw and transformed data in MS-Excel format. The nature of the retrospective survey design and its administration makes it very susceptible to recall error (*i.e.*, interviewee can not correctly remember what occurred in 1999), and response and reporting bias (*e.g.*, the interviewee responds in a way to make the program look good). Also the small sample size reduced the statistical significance of values reported so that only large impacts could be identified.

I. Questionnaire

Refer to following four pages.

District: _____ Community: _____

Client Number: _____ Sex: _____ Date: _____

1. How many people live in this house and eat from the same pot now?

_____, "We will call these people the *household now*."

2. How many people lived in this household and ate from the same pot 3 years ago (1999)?
_____, "We will call these people the *household 3-years ago*."

3. Has anyone else in your compound taken this survey?
No O
Yes O, 4. Who took the survey? _____
5. Is this person in your household now?
No O
Yes O

6. What types of cereal and grain crops did you grow on the household farm …

(check all that apply)	3 YEARS AGO (1999)?	LAST YEAR (2001)?
Maize	O	O
Rice	O	O
Millet	O	O
Sorghum	O	O
Do not know	O	O

7. What storage method do you mostly use for cereals and grain …

(check one each)	3 YEARS AGO (1999)?	LAST YEAR (2001-2)?
Gourds	O	O
Pots	O	O
Grass & clay granary (*kambong*)	O	O
Mud silo	O	O
Basket	O	O
Grain bank	O	O
Bags	O	O
Do not know	O	O

8. What protection methods were used for cereals and grain crop storage …

(check all that apply)	3 YEARS AGO (1999)?	LAST YEAR (2001-2)?
Plant material (neem, etc.)	O	O
Chemicals (actellic, etc.)	O	O
Other	O	O
None	O	O
Do not know	O	O

9. How many months did the food harvest last …

	3 YEARS AGO (1999)?	LAST YEAR (2001-2)?
Number of months	_____	_____
Do not know	O	O

10. What proportion of your grain harvest did you lose in storage (throw away) ...

(check one each)	3 YEARS AGO (1999)?	LAST YEAR (2001-2)?
0-3%	O	O
4-10%	O	O
11-20%	O	O
20-35%	O	O
>35%	O	O
Do not know	O	O

11. What period of the year did you sell the grain after the 1999 and 2001 harvest?

(check one each)	3 YEARS AGO (1999)?	LAST YEAR (2001)?
October to December	O	O
January to March	O	O
April to June	O	O
July to September	O	O
Did not sell grain	O	O
Do not know	O	O

12. How many people suffered from guinea worm in your household during the year

	3 YEARS AGO (1999)?	PAST YEAR (2001-2)?
Number of people from household	_____	_____
Do not know	O	O

13. How much did your household pay as water user fees per year …

	3 YEARS AGO (1999)?	PAST YEAR (2001-2)?
Cedis	_____	_____
Did not pay	O	O
Do not know	O	O

14. How much time does it take your household to collect water daily during the dry season …

	3 YEARS AGO (1999)?	PAST YEAR (2002)?
Time in TZ (tuozafi) preparation units	_____	_____
Do not know	O	O

15. What were your sources of DRINKING water during the dry season …

(check all that apply)	3 YEARS AGO (1999)?	PAST YEAR (2001-2)?
Pond/dug-out/dam	O	O
River/stream	O	O
Well, unprotected	O	O
Well, protected	O	O
Borehole with a pump	O	O
Piped water to your compound	O	O
Public stand pipe	O	O
Truck delivered	O	O
Other	O	O

16. What were/are your sources of DRINKING water during the rainy season …

(check all that apply)	3 YEARS AGO (1999)?	NOW?
Rain water	O	O
Pond/dug-out/dam	O	O
River/stream	O	O
Well, unprotected	O	O
Well, protected	O	O
Borehole with a pump	O	O
Piped water to your compound	O	O
Public stand pipe	O	O
Truck delivered	O	O
Other	O	O

17. Where did/do you go to the bush (toilet)?

(check all that apply)	3 YEARS AGO (1999)?	NOW?
Traditional pit latrine, home	O	O
Traditional pit latrine, public	O	O
VIP, home	O	O
VIP, public	O	O
KVIP, home	O	O
KVIP, public	O	O
Free range	O	O

18. When did you become involved in OIC Tamale activities?

Year _____ Season _____ Activities: _____

Not involved O

19. Have you been involved in any enterprise activities between 1999 and now?

No O (END OF INTERVIEW)

Yes O (CONTINUE)

20. Three (3) years ago (1999), did you have resources to undertake any enterprise activity?
    No O
    Yes O

21. What about now, will you say you have enough resources to undertake enterprise activities?
    No O
    Yes O

22. Three (3) years ago (Year 1999) were you able to plan and implement business decisions that earned you good returns on your investment?
    No O
    Yes O

23. Are you able to plan and implement profitable business decisions on your own now?
    No O
    Yes O

24. What has happened to your PERSONAL income the past 3 years (since 1999)?
    Changed Positively O
    Changed Negatively O
    Remained Unchanged O
    Not Applicable O

25. If we are to divide total household expenses into 10 portions, how many portions were you contributing 3 years ago (1999)?
    _____ (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10)
    Do not know O

26. If we are to divide total household expenses into 10 portions, how many portions are you NOW contributing?
    _____ (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10)
    Do not know O

27. Do you participate in the OIC enterprise training program?
    Yes O "What type of enterprise?" _____
    No O (END OF INTERVIEW)

28. If OICT support is to stop soon, will you be able to continue with this enterprise?
    No O
    Yes O

ANNEX I. LIST OF ACRONYMS

List of Acronyms

ADRA	Adventist Development and Relief Agency
CARD	Center for Agricultural and Rural Development
CRS	Catholic Relief Services
CS	Cooperating Sponsor
CWSA	Community Water and Sanitation Agency
DA	District Assembly
DADO	District Agricultural Development Officer
DAP	Development Activity Program
DCE	District Chief Executive
DWST	District Water and Sanitation Team
FSA	Food Security Advisor
GWEP	Guinea Worm Eradication Project
LOA	Life of Activity
LPC	Local Programme Committee
M&E	Monitoring and Evaluation
MOFA	Ministry of Food and Agriculture
MOH	Ministry of Health
MT	metric ton
NGO	Non-governmental Organization
OICI	Opportunities Industrialization Centers International, Inc.
OICG	Opportunities Industrialization Centers - Ghana
OICT	Opportunities Industrialization Centers - Tamale
PCF	Polyvalent Community Facilitator
PM	Project Manager
RDA	Regional Director of Agriculture
TNS	TechnoServe Inc
TNS/GH	TechnoServe Ghana
TO	Technical Officer
US$	United States dollar
USAID	United States Agency for International Development
WATSAN	Water and Sanitation
WVI	World Vision International