

WEST AFRICAN SORGHUM VALUE CHAIN DEVELOPMENT PROJECT
(GHANA AND SIERRA LEONE)
CFC/FIGG/34

MID-TERM EVALUATION REPORT

JUNE/JULY 2008

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1. INTRODUCTION

1.1 Project Overview

The project is a Public Private Partnership project with the objective to develop a stable and high quality sorghum supply chain that will increase incomes of sorghum farmers and enable national beverage industries to substitute imported grains by locally produced sorghum.

1.2 Project Summary

1.2.1 Title: West African Sorghum Value Chain Development

1.2.2 Number: CFC/FIGG/34

1.2.3 Location: Sierra Leone, Ghana

1.2.4 PEA: European Cooperative for Rural Development (EUCORD)

1.2.5 Start Date: April 2006

1.2.6 Duration: 60 months

1.2.7 Financing:

Total Project Cost: USD 2,897,000

CFC Funding: USD 1,527,000

Co-financing: USD 903,000

Counterpart Contribution: USD 467,000

1.3. Project Stakeholders

FUNCTION	GHANA	SIERRA LEONE
Project Management	Technoserve	VANCIL/CBAN
End User of sorghum	Guinness Ghana Breweries Ltd	Sierra Leone Breweries Ltd
Producer/Supplier	1.Nucleus farmers with out-growers 2. Farming associations and companies 3. Individual commercial farmers 4. Individual small scale farmers 5. Sorghum purchasers	
Input Providers		
1. Credit	Venture Capital Fund and Sinapi Aba Trust	Finance Salone
2. Agro-chemicals	Dizengoff Ghana Ltd	-
3.Agronomical support	Savannah Agricultural Research Institute(SARI), Wa Station	Community Biodiversity Action Network(CBAN), Rokupr Agricultural Research Centre
4.Post Harvest Handling		
4.1. Cleaning and drying	Farmers	Farmers
4.2. Storage	Nasia Rice Mills Company, Tamale	1.Bolon community farm warehouse 2.Sella Kafta community farm warehouse
4.3. Transportation	Various transporters	Various transporters and Brewery

1.4. Objectives Of Mid-Term Evaluation

The objective of the mid-term evaluation is to determine the progress towards the achievement of the goals of the project and to find out whether the planned structures to ensure the achievement of the goals are in place and being effectively implemented.

The evaluation will provide opportunities for finding out if any interventions may be necessary to ensure the achievement of the project goals.

1.5 Methodology

The evaluation comprises three main activities, namely:

- Interaction with stakeholders i.e. farmers, agro-processors (breweries) and input providers (credit providers, suppliers of agro chemicals, providers of technical services such as ploughing, drying, storage and transportation) to elicit their opinions on the project regarding project implementation, challenges, their concerns, benefits and suggestions for improvement.
- Visits to farms, collection/bulking points, processing centres and storage facilities to find out about their operations.
- Review of project reports and documents to evaluate progress of project implementation, to verify the performance and results of planned activities, and to assess the extent and adequacy of documentation of project implementation activities

1.6 Evaluation Team

The evaluation team is made up of Nicolaus Cromme of CFC, Clement Djameh of FAO-IGG Supervisory Body, Ivan Carroll of Vancil, International Project Coordinator and Stephen Mwinkaara of Technoserve, Project Manager of the Ghana component.

1.7 Schedule Of Activities

1.7.1 Ghana

June 28, 2008

- Arrival in Tamale
- Meeting with farmers from Saboba
- Visit to cleaning and storage facility, Nasia Rice Mills Ltd
- Meeting with farmers from Wa area
- Visit to Seed Multiplication centre

June 29, 2008

- Meeting with Sinapi Aba Trust
- Meeting with Technosreve
- Meeting with Guinness Ghana Breweries Ltd
- Meeting with Dizengoff, Ghana Ltd

1.7.2 Sierra Leone

July 1, 2008

- Arrival In Freetown Sierra Leone
- Meeting with Finance Salone

July 2, 2008

- Meeting with Prof Ruoss of CBAN
- Meeting with Ministry of Food and Agriculture
- Meeting with Vancil
- Meeting with Sierra Leone Brewery Ltd
- Departure for Kambia

July 3, 2008

- Meeting with farmers at Bolon and inspection of community warehouse
- Meeting with farmers at Sella Kafta and inspection of community warehouse
- Meeting with various nucleus farmers, outgrowers and commercial farmers at Rokupr Agricultural Research Centre
- Meeting with CBAN

July 4, 2008

- Debriefing and close of evaluation

July 7 to July18, 2008

- Report preparation

2. EXECUTIVE SUMMARY

The project is on track to achieve the set objectives. The planned structures to ensure a successful achievement of the goals are in place and are being effectively implemented. A remarkable success has been achieved regarding the supply of sorghum to the breweries for the partial substitution of barley malt.

All the stakeholders are satisfied with their participation in the project. Farmers in both countries are very enthusiastic about the project. Sorghum has been transformed into a cash crop for which there is a ready market. Sorghum farming has become a profitable and secure agricultural venture.

Economic incentives for all stakeholders are real and perceived. The project is making positive economic impact on the livelihood of farmers. For the service providers, there is increased business. Credit recovery is high with low risk of default. The breweries have access to a reliable supply of a major raw material locally at a competitive cost.

The stakeholders have all realized the need for the sustainability of the value chain beyond the project implementation phase and are considering measures for its achievement. The facilitation of private sector investment in warehousing, purchasing, treatment, storage and supply of sorghum has been identified to be necessary for the sustainability of the supply chain.

The project is being managed operationally and financially very well in both countries. Funds are disbursed according to the budgetary allocations. There is timely release of funds by contributors.

The rationale of the project continues to be relevant. There is increased production and industrial utilization of sorghum. Having successfully established the supply chain, the focus is now directed on ensuring its stability and quality. Traceability and food safety related quality issues need to be addressed. New farming technologies have been introduced and are being implemented. Research activities are on-going to establish the appropriate practices for improved productivity. Local and foreign varieties are being tested for adaptation as high yielding industrial sorghum.

The price offered by the breweries plays a critical role in maintaining the economic attractiveness of sorghum farming. The price needs to be revised alongside the price of other cash crops cultivated by the farmers and the rising costs of inputs which erode rapidly the margin the farmers make.

Drought and floods are real threats to production output in Ghana. Trials are being made with rain-fed irrigation systems to assess their viability.

There is confidence that the project goals and objectives will be successfully achieved within the planned duration of project implementation. The project can already be described as a success for replication in other countries.

3. NARRATIVE / ANECDOTAL REPORTS

3.1 GHANA COMPONENT

In the Ghana the Guinness Ghana Breweries Ltd (GGBL) is the Private Sector Partner with TechnoServe (TNS) as the implementing partner.

Specific Objectives

The specific objectives of the project are to enable sorghum farmers to increase productivity through greater access to improved inputs, processing technologies, and marketing options provided through commercial agribusinesses and producer associations. Assisted by the project, sorghum seed farmers should be able to supply required high yielding varieties and private input suppliers and marketing entrepreneurs would improve the quality of their services to their client farmer groups. The objectives are summarized below:

- Identify and introduce high yielding sorghum varieties with high quality industrial processing characteristics.
- Establish rapid-multiplication farms and sorghum collection centers.
- Form and train village level producer associations and credit groups providing services and financing that enhance the ability of farmers to market increased amounts of quality sorghum.
- Assist reliable producer groups and leading commercial farmers in entering into longer-term partnership with the beverage industry, to coordinate input delivery, to provide post-harvest collection and storage facilities, and to multiply improved sorghum varieties for the next growing season.
- Train private sector input dealers in supplying inputs to sorghum farmers through market mechanisms.

The Ghana program is managed through the nucleus (lead) farmer concept. The project management team selects the lead farmers using a set of criteria. The criteria among other things takes into account the ability of an individual or an organization to organize out-growers to produce and supply sorghum to the brewery. The nucleus farmer must possess or have access to land preparation equipments. The individual or organization must be a trusted member of the community with high integrity. The main stakeholders are Guinness which provides the market for the sorghum produced. The others are service providers. The service providers range from credit providers, inputs suppliers transporters, tractor owners and operators, warehouse operators and cleaning centres. The others are the primary producers who are the out-grower.

Fig 1 Structure and Management of the Ghana Program

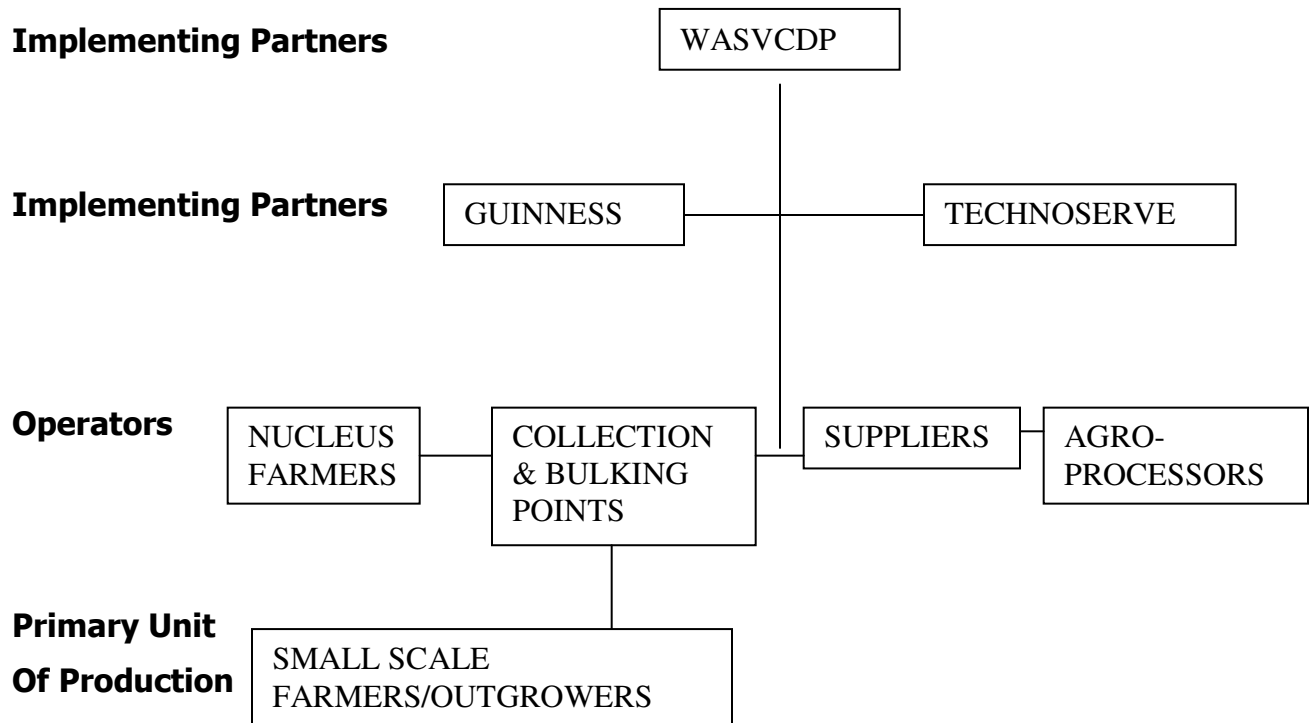
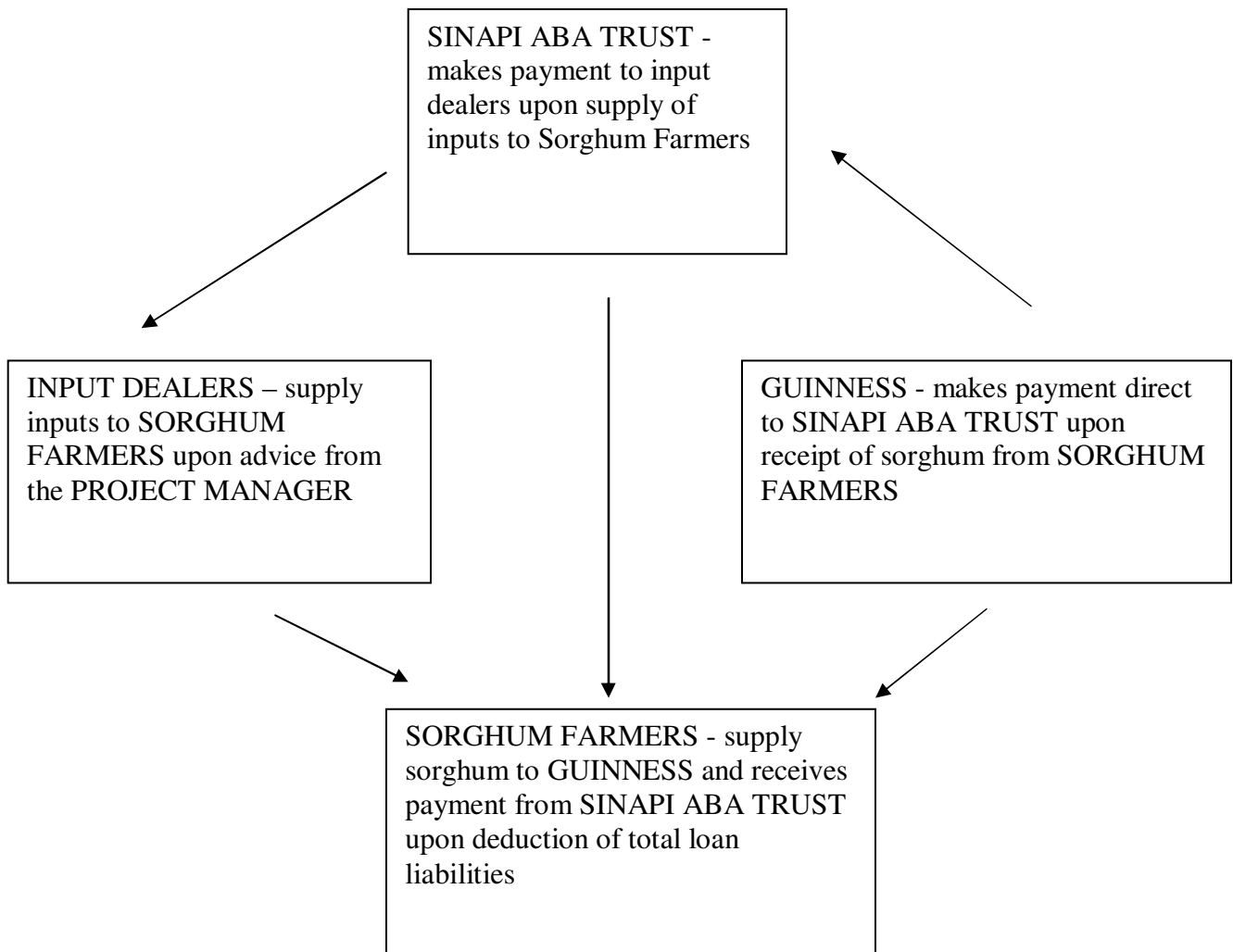


Fig 2: Stake holders and their Roles

Stakeholder	Role
Technoserve	<ul style="list-style-type: none"> • Project implementing agent; coordinates entire project
Guinness Ghana Breweries Ltd	<ul style="list-style-type: none"> • Provides market
Research Scientist	<ul style="list-style-type: none"> • Varietal testing and technical backstopping
Nucleus Farmer	<ul style="list-style-type: none"> • Organize production • Provide market and credit linkages • Mobilize sorghum from out-growers • Undertakes cleaning, packaging and delivery to Guinness • Supervises the production and supply of sorghum • Intermediary between the primary producers and the rest of the stakeholders
Out-growers	<ul style="list-style-type: none"> • Primary producers of the crop • They produce and supply sorghum under contract to the nucleus farmer
Sinapi Aba Trust	<ul style="list-style-type: none"> • Provide credit for inputs and related production activities • Pays for inputs on behalf of farmers
Dizengoff	<ul style="list-style-type: none"> • Suppliers of inputs • Provides technical advice of safe use of agro-chemicals •
Tractor operators	<ul style="list-style-type: none"> • Land preparation • Distribution of inputs
Transport owners	<ul style="list-style-type: none"> • Haulage of sorghum • Haulage of inputs

Fig 3 STRATEGY FOR CREDIT MANAGEMENT



ACHIEVEMENTS TO DATE

The impact of the project has in effect, made the entire supply chain very efficient. The project ensures that farmers have easy access to inputs in a timely manner. The overall impact has been the phenomenal increase in the annual supply from less than 100MT to 1,300MT (see table 2 and fig 3 below). As a result more farmers have gotten involved resulting in a corresponding increase in their family income. Similarly, various beneficiaries along the supply chain have witnessed an improvement in their socio-economic well being. Others have used the income from sorghum to build houses, acquire motorbikes, donkeys and donkey carts to help them improve upon the efficiency of their production.

Fig 4 Output of the Sorghum Project in Ghana

Indicator	2005/6	2006/7	2007/8
Sorghum Output (MT)	112	904	1,272
Spread (No of communities)	44	56	204
Number of participating Farmers	>900	3,210	5,670
Cash income generated 1000GHC	35.84	372.90	524.70

Over 2,000 temporal jobs have been created

3.2 SIERRA LEONE COMPONENT

BACKGROUND/DESCRIPTION

Sierra Leone situated in the west coast of Africa has a population of about 4.9 million. It has a monomodal type of rainfall pattern with at least 6 months of rainfall during May to November. In effect, Sierra Leone has one growing season. The economy is agrarian of which agriculture accounts for over 49% of the national income. Despite the importance of the agriculture sector for Sierra Leone's economy, agriculture continues to decline resulting in the reduction in per capital income.

The development of agro-based industry is a major agricultural policy in Sierra Leone. In the early nineties, rice was used as a source of malt in beverage production as an alternative to barley. However, the continued increase in the price of rice, the staple food, it became an issue of national concern. It was considered necessary to look at the alternative of *Sorghum bicolor* that is underutilized as food crop. But, the production level of sorghum in Sierra Leone is low. The latest crop survey report (2002) indicated that the total sorghum production in 2002 was 31,000 metric tonnes of which only 48% was net available. In effect, there is need to increase sorghum production in order to meet the demand of the beverage industry.

The Community Biodiversity Action Network (CBDC) and the Rokupr Agricultural Research Center (RARC) are the only organizations working on sorghum in Sierra Leone. However, their work has been limited to germplasm collection, characterization and evaluation. Little or no work has been done on improved production techniques such as fertilization, seed rate when planted as sole crop and performance in rotation as a second year crop after rice or intercropped with groundnut. Unlike Nigeria and Ghana, with the monomodal rainfall pattern only one cropping is pattern is permitted. Experiences with exotic sorghum genotypes in trials conducted in Sierra Leone indicate that most of the exotic materials mature early at the peak of the rains and with their compact heading pattern, they suffer extensively from grain mould.

SPECIFIC OBJECTIVE

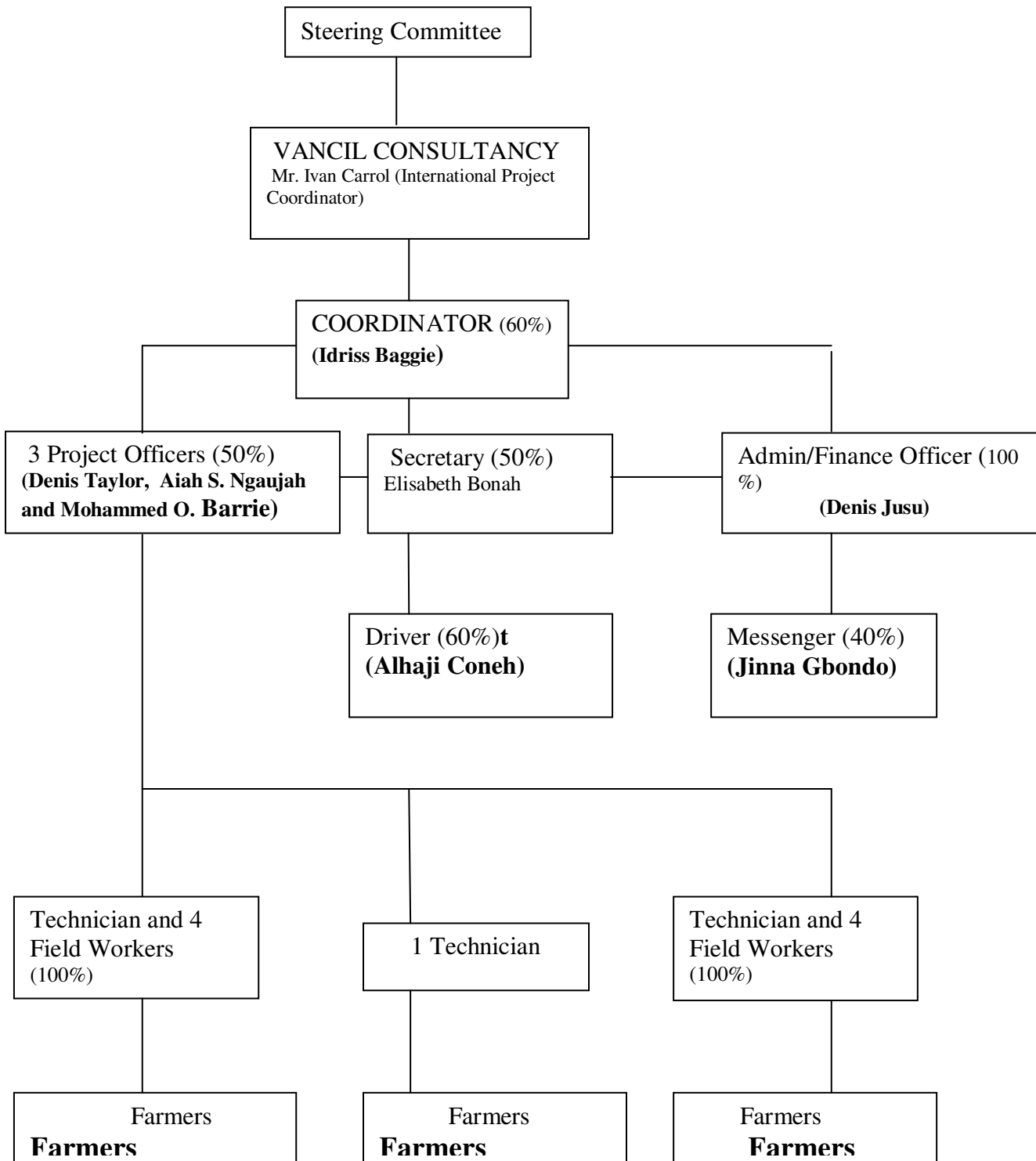
The main objective of the project is to develop a stable and high quality sorghum supply chain in Sierra Leone that will allow the national beverage industry to substitute imported barley with locally produced sorghum.

ORGANISATIONAL STRUCTURE AND MANAGEMENT

The Sierra Leone component is made up of the **VANCIL** Consultancy that is responsible for the administrative and financial disbursement and the Community Biodiversity Action Network (**CBAN**), a local Non Governmental Organization is responsible for the technical implementation of the project activities. The CBAN team consists of the Scientists, Farmers, Community Based Organization (CBO), and Extension workers that form a broad spectrum of expertise for an effective value supply chain. Figure 1 shows the component of CBAN organogram that are involve in the Sorghum Project. The value supply chain is incomplete without the Private sector especially the input providers, credit providers and intermediaries.

ORGANOGRAM –VANCIL CONSULTNCY/CBAN

SORGHUM VALUE SUPPLY CHAIN PROJECT - SIERRA LEONE



Since, most of the traditional farmers grow sorghum on subsistence basis, one approach of working with farmers in enhancing sorghum production is through the contract farming scheme with farmers associations. The contact person of an association is the *group leader*. He or she coordinates activities for and on behalf of the association. He signs for loan given to the association and distributes it to members. Generally, farmers associations operate using two models; some associations established communal farms of sorghum with collective ownership while others prefer working on their individual farms but sell harvested produce collectively. The disadvantage of the communal farming model is that proceeds from sales are shared equally amongst members despite some members contributing very little to the establishment of the farm. With the individual farm model, each farmer is remunerated according to his or her input.

Within an area of more than 10 associations, *nucleus farmers* are normally encouraged. The nucleus farmer is responsible for purchasing the sorghum from the individual farmers/ associations, processing and bagging for onward transmission to the Sierra Leone Brewery Limited. The areas of coverage or the number of farmers under a nucleus farmers control depends on his capacity. The structure is now operating in Port Loko, Kambia, Koinadugu, Bombali, Kono, Kenema, Bo and Moyamba districts.

In addition to the models of working with subsistence farmers, large scale growers of sorghum are strongly encouraged to grow sorghum as sole crop. During the period under review, 5 large scale growers have been identified who have cultivated over 100 acres of sorghum as sole crop.

Roles and Activities of stakeholders

The main role of CBAN is to facilitate all activities to increase sorghum production for the beverage industry. CBAN trains farmers in appropriate production techniques, harvesting, processing and standardization of sorghum. In effect, CBAN develops and evaluate appropriate sorghum genotypes and associated technologies; facilitate the establishment of large scale production sites and collection centers; train farmers, credit providers and input dealers and facilitate partnership contract between farmers, input providers, intermediaries and the Sierra Leone Brewery Limited. One important role of CBAN also is to periodically negotiate price with the SLBL for the farmers.

The SLBL is currently the sole buyer of the processed sorghum while the input providers provide inputs such as fertilizers, pesticides and herbicides. Intermediaries such as CBOs and small scale retailers could also provide inputs directly to farmers. The farmers play the pivotal role of producing the sorghum. The credit dealers provide seasonal credit to the sorghum farmers.

Current status/ achievements to date

To date, only one sorghum variety has been developed and supplied to farmers for planting. Fourteen local sorghum germplasm are currently being evaluated for good agronomic and brewery qualities. Appropriate sorghum based cropping systems have been developed and 2,500 farm families grow sorghum throughout the country. Five large scale growers have been and 3 collection centers have been identified. Two stores

have been built in two villages in the Kambia district, Northern region. For the cropping season of 2007/2008, a total of 65 metric tonnes of sorghum has been supplied to the Sierra Leone Brewery Limited. Over the years, a total of 350 farmers' representatives have been trained in sorghum production, harvesting and processing techniques. Credit facilities for farmers have been finalized through funding from the Robobank in the Netherlands. FinanceSalone is the implementing agency. One contract agreement between farmers and input providers has been facilitated. For the 2008 cropping season, pricing negotiation of harvested sorghum with the Sierra Leone Brewery has been initiated after consultation with the nucleus farmers. Four intermediary agents have been identified.

4. FIELD VISITS AND FINDINGS

4.1. Ghana

4.1.1 Farmers

In Ghana, sorghum is cultivated under the project by nucleus farmers and their out-growers, individual commercial farmers and farming companies and associations. A nucleus farmer typically works with about 100 to 300 out growers. The farms are in blocks with each out-grower cultivating between 1 and 5 acres of field. The out-growers are made up of both men and women.

The evaluation team met and held discussions with groups of farmers from various locations. The farmers evaluated the project positively and are happy with their participation. They mentioned the introduction of high yielding varieties, training received on agricultural practices such as land selection, land preparation, correct planting distances, thinning and provision of credit facility as some of the benefits they are enjoying from their participation in the project. They were all unanimous in acknowledging an increase in their incomes through cultivation of sorghum. The increase in income is estimated to be about 40%.

Their major concerns are the increasing cost of production. Labour costs and tractor services in particular are reported to be rising sharply. It is feared that if price increases for the produce are not effected the business will become unprofitable. It was also reported that the open market price of sorghum has more than doubled within the year and the price of other cash crops such as maize and groundnuts have become more attractive than the price of sorghum.

They suggested the establishment of irrigation systems to counter the uncontrolled rainfall pattern which sometimes leads to low outputs.

4.1.2 Nasia Rice Mills Company

The team visited Nasia Rice Mills Company in Tamale which has been contracted to clean and store sorghum for the project. The company has the necessary equipment and capacity to provide the required services but the facility was found to be in a

deplorable state of housekeeping. There was evidence of the presence of rodents and birds were observed flying in and out of the processing areas.

4.1.3 Sinapi Aba Trust

This is the outfit that provides credit facility to the farmers. The funds are received from Venture Capital Fund for disbursement. Sinapi Aba Trust bears the entire risk of financial loss. Credit recovery is reported to be good. The Trust is so far satisfied with its participation in the project. They expressed particular satisfaction of achieving their vision of providing assistance to the poor and facilitating increased production of cash crops. Their concern is the bureaucracy at Venture Capital Fund and consequent delay in sourcing the funds. Forging of linkages with financial institutions such as CFC and Rabobank to provide guarantee for credits has been suggested as a means of improving their operations.

4.1.3 Project Management – Technoserve.

The director Mr. Nick Railston- Brown rated the project progress and achievement as good. He however expressed the need for improving productivity. He suggested the application of improved technologies such as introduction of hybrids which have yields of 3 to 3.5 tons per hectare compared to 1 to 1.5 tons per hectare of the normal sorghum varieties. He named availability of warehouses as a requirement for increased production. The challenges reported are the management of risk of unreliable climatic conditions and the sustainability of the supply chain after the end of the project. For the later he suggested good pricing and investment by entrepreneurs in the supply chain in areas such as warehouses, quality and credit facility.

4.1.4 Guinness Ghana Breweries Ltd

Guinness Ghana Breweries views the project as still being in the developmental stage. The tremendous increase in sorghum grain production and supply has been well acknowledged. An improvement in production yield in the second year of the project over the low yields of the first year was noted and commended. The supply schedules of the brewery have been met with satisfaction. The projected use of 2000Mt of sorghum per annum amounts to only 10% of the entire grain requirement of the brewery. In Guinness stout brand, sorghum makes up 20% of the grist material and could be increased to 40%. Sorghum could also be used in the production of other brands. The brewery has reported the prospects for the use of sorghum in the brewing industry to be very good but requiring incentives from the government to be realized. The reason for the use of sorghum was given as fulfillment of corporate responsibility and the preference of sorghum over maize grits because of the limited shelf life of maize grits.

Concerns over the next two years were given as factors that affect food safety, namely:

- traceability – ability to trace consignments to the source of supply, verification and control at production centres.
- the employed agronomic practices - non use of unsafe and contentious methods such as genetic modification

- post harvest treatment of grains – use of acceptable treatment chemicals for fumigation
- level of contaminants – residual levels of pesticides, herbicides, and mycotoxins within the acceptable levels

On sustainability of the supply chain from the end of the project, Guinness Ghana Breweries Limited considers two possibilities: private sector investors taking over grain handling and supply or the brewery drawing off grains held for it in warehouses. The brewery wishes to monitor the management of warehouses and post harvest treatment of grains. It proposes to visit farms during harvest time to observe threshing processes.

The brewery has indicated that it has no experience with malting sorghum but will be interested in using malted sorghum if a good source of supply is available. The brewery would also prefer the use of malted sorghum to the use of enzymes with unmalted sorghum for its brewing processes.

4.1.5 Dizengoff Ghana Ltd

Dizengoff supplies agro chemicals such as fertilizers, pesticides and herbicides to the farmers. The company reported that it provides support to farmers by way of advice to nucleus farmers on the use of their products. They also monitor the use of the chemicals and the response on the field. The chemicals are provided at dealer prices. The relationship with the project was described as very satisfying and profitable.

4.2 SIERRA LEONE

4.2.1. Finance Salone

Finance Salone is a micro finance institution which has undertaken to provide credit for farmers participating in the project. It has a financial outlay of USD2.5 million. An amount of USD60,000 provided jointly by Finance Salone and Rabobank will be committed initially for the credit scheme at 2.5% interest rate per month. Finance Salone has previous experience with the provision of credit for market women with 98% loan recovery. It will rely on the project to recommend farmers for the credit. VANCIL shall collect payments from the brewery for Finance Salone. It is intended to use the credit facility with the farmers as a pilot project.

4.2.2 CBAN

CBAN in collaboration with Rokupr Agricultural Research Centre is providing agronomical support for the project. The outfit has the expertise to carry out needed research activities to enhance sorghum production.

CBAN also purchases sorghum from the farmers and processes it for supply to the brewery.

It was reported that local sorghum variety available is suitable for brewing purposes but has a low cultivation yield. The challenge therefore lies in meeting the demand of the brewery at a competitive cost. The two options available for achieving this were given as increasing the acreage planted with the involvement of a relatively high

number of farmers or the improvement of yield. Improvement of yield requires the adoption of good practices and development of hybrids of exotic and local varieties. High yielding varieties from ICRISAT with resistance to pests and diseases are being tested. The project has been described as a good model for the development of value chain of other crops such as rice. It is reported that AGRA and WARDA have already adopted the model.

4.2.3 Ministry Of Agriculture, Forestry And Food Security

A meeting was held with the Acting Director General of the ministry, Mr. Francis Sankoh and some of his senior staff to discuss the project. The Ag. Director General observed that the project was making good impact and was on the right track of poverty alleviation. He however cautioned on the risk of cultivating specific cash crops for their immediate cash at the expense of other staple crops which may endanger food security. The project was rated positively and he gave the assurance that the ministry will provide all necessary support to facilitate the successful implementation of the project.

4.2.4 Sierra Leone Brewery Limited

The evaluating team was conducted round the production department of the brewery by the Managing Director during which he explained how sorghum supplied is received, tested, stored and processed. This was followed up with a presentation on the impact of the project on poverty alleviation. The Managing Director was very enthusiastic about the project and commended it highly. He reported that the brewery was highly satisfied with the progress and achievement of the project. He stated that 65MT of sorghum grain had so far been supplied to the brewery. The planned usage of 5% and 10% of sorghum grain in Star lager beer and Maltina respectively, will yield an annual requirement of 150MT of sorghum. Trials were also being carried out to incorporate the use of sorghum in the remaining product brand, Guinness stout. The projected usage rate of 20% will bring the total requirement to 200MT per annum. The brewery has installed a grain processor at the cost of 400,000 Euro to enable the increased usage of sorghum grains.

The director observed that sorghum has been rapidly transformed into a cash crop and that the brewery could replace its entire requirement of grist material of 20,000MT with sorghum ultimately. This however, he stated would be undertaken with the use of commercial enzymes rather than malting sorghum for enzyme development. He gave the reason that the small grain size of the local sorghum does not favour malting as the accompanying malting losses will be excessively high.

The brewery expressed its satisfaction with the quality of the grains supplied and also with the delivery schedule. The physical constraint is the low cultivation yield.

On sustainability of the value chain after the end of the project, the brewery plans to use the nucleus farmers as an interface between it and the farmers.

With pricing, the brewery as the sole user determines the price as applies the "buyer's market" principle but with due consideration to the farmers interests.

4.2.5 Bolon Farming Community In Kambia District

Members of the farming community received the evaluation team in a festive mood. After the introduction of team members and announcement of their mission, the farmers were invited to comment on the progress of the project implementation, their concerns and the impact of the project on their livelihood. The Lead Farmer on the behalf of the community made an assessment of the project. He reported that the project was bringing money into the community and they hoped that it would continue doing so. They treasure the project and as there were indications that it would relief poverty in the community. He indicated that they were capable of producing a lot more sorghum if they were empowered to grow more through the provision of cash credit. For the present, the ready market for the sorghum was reported as the only incentive for growing sorghum and the driving force behind the project. Comments from individual farmers were also centered on the provision of cash credit.

A poor harvest of rice during the year combined with the general increase in food prices was reported to have made the purchase of rice beyond their means. They were therefore compelled to keep the sorghum for food instead of selling to the project. A community storage facility constructed at the cost of USD1500 financed equally by the project and the community was inspected. All the sorghum grain harvested and purchased are kept in the store for collection to the brewery.

4.2.6 Sella Kafta Farming Community, Kambia District

In this community also, the farmers welcomed the evaluation team with jubilation. The farmers embrace the project with joy and are willing to put in more effort. The project, they reported, is providing them with ready cash to look after their families. The farmers were provided with credit in form of seeds but have been unable to pay back the seeds. The shortage and high price of rice compelled them to keep the sorghum for their feeding.

A community warehouse to provide storage for sorghum was inspected. The farmers find the availability of the warehouse useful as they were not having adequate space to store the sorghum and other produce.

4.2.7 Meeting With Nucleus Farmers, Lead Farmers And Out Growers At Rokupr Agricultural Research Centre

A meeting was organized at the Rokupr Agricultural Research Centre for individual farmers and entities providing sorghum for the project. The farmers gave their reason for participation in the project as the knowledge that the price of sorghum will be good and that it will bring instant cash. The farmers cultivate groundnuts, rice, cow pea and soya beans in addition to sorghum.

Under the project, new farming skills have been acquired such as inter-cropping with groundnuts, planting in rows and cultural practices for sorghum. The farmers are happy with the project as the participation has brought improvement in their livelihoods. They appreciate the benefits of the training they are receiving as it translates into improvement of yield. The average yield per acre was reported to increase from 3 x 50kg bags before training to 8 x 50kg bags after the training.

There ready market for sorghum has encouraged the cultivation of sorghum. Many more farmers are willing to participate in the project.

The major concern is the high cost of transportation. The poor road network and bad condition of the roads contribute to the high transportation costs. The farmers expressed the urgent need for the brewery to increase the price offered for sorghum to keep the cultivation of sorghum profitable. Some sorghum suppliers reported of frequent losses they make when farmers fail to deliver sorghum to them after they have pre-financed the cultivation. The farmers and sorghum suppliers have expressed their desire to form an association to protect their interests, especially in the negotiation of price with the brewery. They have requested the project to assist them with access to loan from banks by way of introduction letters.

There are both males and females participating in the project as out-growers and individual farmers. The project does not place any sex at a disadvantage.

4.2.7 Presentation By CBAN on Varietal Improvement and On Best Practices For Sorghum Cultivation.

CBAN made a presentation to the team on their approach to varietal improvement, the trials carried out and the results obtained. The peculiar characteristics of local sorghum varieties were described and how these characteristics are being modified. The presentation also covered documentation on best practices for cultivating sorghum in Sierra Leone.

5. DOCUMENT REVIEW

The team members from CFC and the Supervisory Body, FAO-IGG requested the project managers for some specified documentation that are required for the evaluation of the progress of project implementation, to verify performance and results of planned activities, and to assess the extent and adequacy of documentation of project implementation activities. A report on the documentation is presented below.

DOCUMENT	COUNTRY	AVAILABILITY	ADEQUACY OF CONTENT	REMARKS
1. Manual for developing Best Practices	Ghana	Not presented		Best practices are being developed. There are however no manuals to indicate the development plan.
	Sierra Leone	Not presented		

2. Report on Best Practices Developed e.g. Planting distance , use of fertilizer, pesticide, harvesting, post harvest treatment	Ghana	Yes	Covers investigations into grain yield potential as a function of plant population, fertilizer requirements for Dorado. General information on best practices is presented in Training Manual	Other specific investigations are foreseen
	Sierra Leone	Yes	Covers appropriate management practices for sorghum production	

3. Varietal Selection Procedure Manual	Ghana	Not Presented		Procedure manuals specifying methodology and evaluation criteria have not yet been developed
	Sierra Leone	Not presented		
4. Reports on Varietal Performance e.g. yield, resistance to disease and pests, brewing performance	Ghana	Not presented		Information is available but scattered.
	Sierra Leone	Presented	Adequate	
5. Training Manual-Farmers i.e. Topic and kind of training	Ghana	Presented	Training content available but kind of training not specified	
	Sierra Leone	Not presented		
6. Training/Workshop Reports – Farmers Training held, list of participants, training evaluation	Ghana	Reports presented		
	Sierra Leone	Two reports were presented on workshops to acquaint producers on strategies for enhancing Sorghum production and to discuss production constraints.	Adequate for the purpose	No report was presented on specific training for farmers

7. Training Manual – Private sector i.e. Topic and kind of training	Ghana	Not presented		
	Sierra Leone	Not presented		
8. Training/Workshop Reports – Private sector Training held, list of participants, training evaluation	Ghana	Not presented		
	Sierra Leone	Not presented		
9. Impact Assessment Report – Increase in farmers income	Ghana	Not presented		
	Sierra Leone	Presented	Report is comprehensive but has not quantified the increase in income derived from sorghum cultivation.	

The cyclical project progress reports and presentations during steering committee meetings were used to evaluate the progress of the project.

6. PROJECT ASSESSMENT

6.1 Overall Assessment

The project has progressed steadily and is on track to achieve the set objectives. The planned structures to ensure a successful achievement of the goals are in place and are being effectively implemented. A remarkable success has been achieved regarding the supply of sorghum to the breweries for the partial substitution of barley malt. In both Ghana and Sierra Leone, the requirements of the breweries for sorghum are being met. Deliveries are on schedule and the quality of the grains is satisfactory.

Farmers in both countries are very enthusiastic about the project. The benefits of their participation in the project are felt and appreciated. There is an appreciable increase in income derived from sorghum farming. Sorghum has been transformed into a cash crop for which there is a ready market. Sorghum farming has become a profitable and secure agricultural venture. The technical knowledge of the farmers has been enhanced through the provision of training.

For the service providers, there is increased business. Credit recovery is high with low risk of default.

Economic incentives for all stakeholders are real and perceived. The stakeholders have all realized the need for the sustainability of the value chain beyond the project implementation phase and are considering measures for its achievement.

The project is being managed operationally and financially very well in both countries. Funds are disbursed according to the budgetary allocations. There is timely release of funds by contributors. Communication between stakeholders is effective. Steering committee meetings are held annually where progress of the project implementation is reported and discussed. Farmers' days and durbars are held to bring farmers and other stakeholders together to share experiences.

The rationale of the project continues to be relevant. There is increased production and industrial utilization of sorghum. New farming technologies have been introduced and are being implemented. There is a significant increase in productivity. Research activities are on-going to establish the appropriate practices for improved productivity. Local and foreign varieties are being tested for adaptation as high yielding industrial sorghum. Even though these activities result in increase yields per hectare, the rising costs of inputs erode the margin the farmers make. The rising cost of imported barley malt however leaves room for pricing that will keep sorghum cultivation attractive to the farmers, especially when the parity pricing concept is applied.

Drought and flood are real threats to production output. Trials are being made with rain-fed irrigation systems to assess their viability.

There is confidence that the project goals and objectives will be successfully achieved within the planned duration of project implementation. The project is making positive economic impact on the livelihood of farmers. The project can already be described as a success for replication in other countries.

6.2 Progress Towards Achievement of Set Targets

PLANNED ACTIVITY	TARGET TO BE ACHIEVED AFTER 5 YEARS	LEVEL REACHED AFTER TWO YEARS	PERCENTAGE OF TARGET	REMARKS
High yielding sorghum varieties for industrial use	3 varieties	1		In both Ghana and Sierra Leone, varietal selection trials are being carried out to identify or develop high yielding varieties.
Commercial sorghum seed multipliers operational	At least 20	10	50	
Bulking Points	20	25	125	
Commercialized industrial sorghum	10,000MT	2213MT	22	The output is driven by the demand from the breweries. The breweries' requirements were met in the second year.

Farmers growing industrial sorghum	10,000	4,000	40	A lot more farmers express interest to participate in project.
Seasonal credit/95% credit repaid at due date	USD900,000	USD1,000,000	111	Credit recovery is above 95% in Ghana. Credit provision is yet to commence in Sierra Leone.
Increase of household income from sorghum	40-60%			Benchmark study is yet to be reported.
Private sector agricultural input and service providers trained	120	120	100%	Training is yet to commence in Sierra Leone
Credit inventory projects	4	-	-	Credit inventory system has not yet been introduced
Prototype contract partnership mechanisms	3	2		The 3 contracted were concluded in Ghana. Sierra Leone is processing contracts

6.3 Observations

6.3.1. Good price and the ready market available for sorghum are the motivation for the farmers to participate in the project

6.3.2. In both countries, the focus is at present on the development of infrastructure for the production of sorghum to meet the demand of the breweries.

6.3.3. The breweries are using sorghum for now, in the unmalted form as adjunct. Suitability for malting has not been taken into consideration when selecting varieties for cultivation.

6.3.4. In Sierra Leone the local sorghum variety usually cultivated by farmers is the variety being produced for the brewery. It meets the breweries requirement as a brewing adjunct but is not a high yielding variety. In Ghana, a local sorghum variety, (*Kyereh*) and two introduced varieties (*Kapaala and Dorado*) are being produced for the brewery. Kapaala and Dorado have good potential for malting but are highly susceptible to mould development. For all the varieties being produced for the breweries the results of tests to enable their classification as high yielding varieties are yet to be compiled and evaluated.

6.3.5. Farmers have reported 0.7 to 0.8MT/ha in Ghana and 0.2 to 0.4MT/ha in Sierra Leone. The project has reported an increase from 0.8MT/ha at the beginning of the project in 2006 to 1.6MT/ha in 2008. FAO reports the following yields for the year 1992:

Country	Ghana	Nigeria	Gambia	Mali	Burkina Faso	Niger	Togo	Burkina Faso
Yield (t/ha)	0.6	0.92	0.90	0.82	0.82	0.36	0.64	0.82

Country	Ethiopia	Uganda	Zimbabwe	Tanzania	India	Sudan	Argentina	USA
Yield (t/ha)	1.00	1.42	0.59	0.86	0.78	0.55	3.42	4.31

6.4.6. In Sierra Leone, most farmers are individual farmers with very small acreage and output. The number of farmers involved in producing the total output of sorghum is relatively high as compared to Ghana where farms are larger. The collection, bulking and processing of sorghum for delivery to the brewery is more labour intensive in Sierra Leone.

6.3.7. Farmers participating in the project do not exclusively cultivate sorghum. They are also in the cultivation of other staples. In Ghana however, they are more focused on sorghum cultivation.

6.3.8. The project appears to be considered more as an aid or assistance project in Sierra Leone than a business venture. The farmers are dependent on the project for their activities.

6.3.9. Documentation of project activities is generally inadequate. Some of the documentation specified in the project document for monitoring, evaluation and verification of activities were not available. Among them are training manuals, training reports and evaluation of training, Varietal Selection procedure manual, training manuals for private sector specifying topic and kind of training.

6.3.10. Agronomical trials and research to support the project is extensive in Sierra Leone and handled by a team of scientific officers. In Ghana, it appears to be limited in scope and engagement.

6.3.11. Demonstration farms are very effective means of communicating best practices. Farmers' day and durbars bring together stakeholders to share experiences.

6.3.12. All stakeholders are sensitized on sustainability of the supply chain after the project implementation phase and it is being adequately addressed. Credit groups have not been established at village level to enable farmers benefit from possible lower interest rates.

6.3.13. Efforts are being made to stem the increasing cost of production by the introduction of inter-cropping system and the use of organic manure as substitute expensive chemical fertilizers.

6.3.14. Inventory credit pilot projects have not been implemented.

7. RECOMMENDATIONS

7.1. Farmers, in particular, nucleus farmers should be educated to consider the cultivation of sorghum as a business venture into which they should invest resources. The farmers should be empowered through appropriate training in entrepreneurship.

7.2. Price paid for sorghum by the breweries should be reviewed alongside other cash crops cultivated by local farmers using the parity pricing system in order to maintain the economic attractiveness of sorghum cultivation.

7.3. Now that the infrastructure for sorghum production has been sufficiently established, efforts should now be directed to the development of the quality and stability of the supply chain. Key performance indicators such as quantifying performance by the use of appropriate performance indicators e.g. yield per acreage, failures on the field, on time delivery, rejected deliveries, , Entrance control reports on grains supplied to the breweries, credit access and recovery.

7.4. Breweries to involve their procurement and quality assurance staff in the various components of the supply chain to keep them informed on issues and to help establish quality.

7.5. The nucleus farmer with out-growers system needs to be expanded in Sierra Leone to reduce the associated high transportation cost arising from the collection of very small quantities over a wide area.

7.6. Credit groups to be established at village level with farmers' participation.

7.7. Relevant project activities to be adequately documented and archived to facilitate transfer of knowledge in the event of replication of the project in other countries and to enable monitoring, evaluation and verification of project activities.

7.8. The government should be approached to provide incentives to breweries to encourage the expanded use of sorghum

7.9. Private sector investment in warehousing, purchasing, treatment, storage and supply of sorghum should be facilitated for the sustainability of the supply chain. Appropriate training to be provided to identified nucleus farmers to empower them to take up the role as direct suppliers to the breweries when the project comes to its end.

7.10 Sorghum breeders to embark on programmes to increase yield through the development of new agronomical better sorghum hybrids by active, selective breeding.

8. ANNEXES

8.1. Status of Project Implementation.

Table 1 summarizes the progress of the project in the two countries, Ghana and Sierra Leone for two years of project implementation (April 2006 to March 31, 2008).

Table 1.

Planned Activities	Targets Set	Present Status	Remarks
Component I: <i>Development, Test and Introduction of New Industrial Sorghum Varieties and Technologies</i>			
<ul style="list-style-type: none"> • Development, of a varietal selection program through participatory variety screening and laboratory testing • Participatory development of best practices for the cultivation of sorghum and training of farmers through on-farm testing and demonstration trials 	<ul style="list-style-type: none"> - 3 varieties - 10,000 families farming improved sorghum 	<p>TOTAL:</p> <ul style="list-style-type: none"> - 4 varieties identified - 4,000 registered farmers growing commercial sorghum <p>GHANA:</p> <ul style="list-style-type: none"> - 3 varieties currently under investigation - More than 3,000 farm families currently registered 	<p>GHANA:</p> <ul style="list-style-type: none"> - 'Kyeré' is a local variety which is being investigated for its malting properties and field performance. It will be supplied and used as a raw material for the use as adjunct in addition to Dorado. About 20 acres of a Dorado seed program being implemented make certified seed available. In addition, the cleaning of the existing farmers variety is being cleaned under the <i>participatory farmer selection program</i> The research stations are working on modifying Kapaala to make it adaptable to the ecological zones though this is not really a priority to the project

		<p>SIERRA LEONE:</p> <ul style="list-style-type: none"> - 1 sorghum variety identified and supplied to farmers - 6 selected local germplasms are currently being evaluated for good agronomic quality - 5 sorghum germplasm materials (from 20 original crosses of the guinea and exotic types from ICRISAT) have been selected for further evaluation - Appropriate sorghum-groundnut mixed cropping systems are being developed to reduce inorganic fertilizer use - 1,000 farm families registered 	<p>SIERRA LEONE:</p> <p>More farmers are willing to participate in the on-station and on- farm participatory trials.</p> <p>More farmers are intercropping sorghum with groundnut in their farms.</p> <p>Research continues to identify adaptable white sorghum genotypes.</p>
Component II: <i>Establishment of Rapid-Multiplication Enterprises and Collection Centers</i>			
<ul style="list-style-type: none"> • Recruitment and training of large scale farming entrepreneurs who are willing to engage in collaborative outgrowers programs with surrounding farmers and farmer groups 	<ul style="list-style-type: none"> - 5 seed multipliers active - 20 bulking points - 10,000 MT commercialized sorghum 	<p>TOTAL:</p> <ul style="list-style-type: none"> - 2,213 MT commercialized sorghum (of which 943 MT during year 1 of project) - 25 bulking points - 10 seed multiplier active 	
		<p>GHANA:</p> <ul style="list-style-type: none"> - 5 seed multipliers active - 16 bulking points - 2,123 MT (903 MT in previous year) 	<p>GHANA:</p> <p>4 see multipliers have been identified and being assisted to multiply seed under irrigation for the coming season.</p> <p>Nucleus / lead farmers also serve as the bulking points</p>

		<p>SIERRA LEONE:</p> <ul style="list-style-type: none"> - 3 large scale sorghum growers identified - 9 collection centers identified - 2 stores constructed and in use - 90 MT of sorghum supplied to SLBL (40 MT in previous year) 	<p>SIERRA LEONE:</p> <p>Activities extended to more areas involving more nucleus farmers. And farm families</p>
Component III: Training of Producers Associations and Credit Groups			
<ul style="list-style-type: none"> • Identification, formation and training of Producers Associations in improved sorghum cultivation, storage technologies and administrative management • Identification, formation and training of village level Credit Groups in order to provide sustainable savings and credit services for their members 	<ul style="list-style-type: none"> - # farmers trained - 40-60% increase in household income derived from sorghum - \$900,000 in seasonal credit - 4 inventory credit pilot projects 	<p>TOTAL:</p> <ul style="list-style-type: none"> - 2,211 farmers trained - \$1,000,000 in seasonal credit - no inventory projects 	
		<p>GHANA:</p> <p>1,811 farmers trained</p> <p>Over \$1 million of credit leveraged in addition to the \$500,000 in the previous year. Thus, total credit leveraged to date is approximately \$1,500,000.</p>	<p>GHANA:</p> <p>A total of over 3,000 farmers are currently registered as sorghum farmers and have benefited from both direct and indirect training programs. Out of this, 700 farmers have been trained directly bring the total number of farmers benefiting from such trainings to 1,811</p> <p>Total credit leveraged to date is over \$1,5m - A total of over 3,000 farmers are currently.</p>

		<p>SIERRA LEONE:</p> <ul style="list-style-type: none"> - 350 nucleus, lead and master farmers in 5 districts trained in improved sorghum production techniques - 30 nucleus and lead famers trained in post-harvest operations - Modalities for credit facilities to sorghum farmers finalized between FinanceSalone, CBAN, EUCORD, and SLBL, Agreement has been signed by all parties. - An impact assessment study showed an estimated 15-20% increase in household income. The number of female farmers growing sorghum did increase by 10%. 	<p>SIERRA LEONE:</p> <p>No training of credit groups has been conducted yet, since funds have recently been secured</p>
Planned Activities	Targets Set	Present Status	Remarks
<i>Component IV: Development of Contract/Partnership Mechanisms between Producers, Input Providers, Intermediate Agents and Agro-Processors</i>			
<ul style="list-style-type: none"> • Broker contract discussions between nucleus farmers and outgrowers in order ton identify and test prototype of • Broker contract discussions between agro-processors and nucleus (commercial) farms and/or 	<ul style="list-style-type: none"> - 3 prototype contracts 	<p>TOTAL:</p> <p>3 prototype contracts</p>	
		<p>GHANA:</p> <p>Training sessions aimed at formalizing agreements are ongoing</p> <p>3 prototype contracts</p>	<p>GHANA:</p> <p>Contract between Dizengoff (Input Supplier) and Sinapi Aba Trust (credit provider) , and Between Venture Capital and Sinapi Aba for a 10 bn cedis (\$1m) credit facility effected Between the Nucleus farmers and Sinapi Aba finalized</p>

<p>producer associations in order to identify long-term contract mechanisms between two or more actors in the sorghum supply chain.</p>		<p>SIERRA LEONE: Facilitate the development of 2 contract agreement between credit/input providers and farmers Facilitate pricing negotiation of harvesting sorghum w/SLBL</p>	<p>SIERRA LEONE: Since the area of coverage has been recently increased, intermediary agents and input providers continue to be identified</p>
<p>Component V: Training of Input dealers and Credit Providers</p>			
<ul style="list-style-type: none"> • Training of input dealers in order to establish a private sector led input distribution • Training of credit providers in order to provide short and long-term credit to groups of smallholder farmers 	<p>- 120 service providers trained</p>	<p>TOTAL: 120 service providers trained</p> <p>GHANA: 120 service providers trained</p> <p>SIERRA LEONE: 5 input providers identified and to be trained</p> <p>Two potential credit providers identified</p>	<p>GHANA: Service providers in the transport, processing, land preparation sectors such as tractor owners and operators are more relevant. Thus a total of 50 currently are being assisted to integrate into the system and to meet the standards of the industry</p> <p>SIERRA LEONE: Input and credit providers are yet to be trained.</p>

Resource Utilization

Table 2 summarizes the expenditures occurred by the project during the first 24 months of the project.

Table 2.

CFC/FIGG/34		RESOURCE UTILISATION (USD)				April, 2006 - March 31, 2008				
CAT.	PROJECT BUDGET FOR 5 YEARS				ACTUAL EXPENSES TO DATE			BALANCE TO DATE		
	TOTAL COST		CO-FINANCE	COFINANCE	CO-FINANCE	CO-FINANCE	COFINANCE	COFINANCE	COFINANCE	
		CFC	PRIVATE	NGO	CFC	PRIVATE	NGO	CFC	PRIVATE	NGO
1	184,300	184,300	0	0	127,257	0	0	57,043	0	0
2	10,500	8,625	1,875	0	6,465	41	0	2,160	1,834	0
3	230,406	115,203	115,203	0	55,181	54,305	0	60,022	60,898	0
4	930,816	368,301	368,301	194,215	136,154	116,243	88,042	232,147	252,058	106,173
5	64,350	0	32,175	32,175	0	0	31,427	0	32,175	748
6	99,741	99,741	0	0	56,164	195	1,864	43,577	-195	-1,864
7	237,309	153,655	83,655	0	44,500	46,958	3,471	109,155	36,697	-3,471
8	779,784	334,697	227,017	218,070	130,867	88,288	62,839	203,830	138,729	155,231
9	190,000	190,000	0	0	0	0	0	190,000	0	0
10	169,980	72,726	74,615	22,639	0	0	0	72,726	74,615	22,639
TOTAL	2,897,186	1,527,248	902,841	467,099	556,588	306,031	187,642	970,660	596,810	279,457

CFC expenses to date* 36%
Private Sector 34%
NGO match 40%

Samples Of Questionnaires Used For Interviewing Stakeholders

8.3.1. Questionnaire for Breweries

1. How would you assess the progress of the project so far towards the achievement of the set objective of development of a stable and high quality sorghum supply chain that will allow the national beverage industry to substitute imported grains by locally produced sorghum?

Slow Good Very Good

Please comment on the following:

1.1 Stability of the supply chain

- Is there any consistency in the supply of grains at the present planned level?
- Are supplies delivered on schedule?
- Can the supply of grains be maintained over a long period of time?
- Can the consistency be maintained at increased levels?
- In instances of sudden unplanned rise in demand, was supply able to cope?

1.2. Quality of the supply chain

1.2.1. Are your expectations being met (or even exceeded)?

1.2.2. Are you satisfied with the quality of the grains?

- Extract yield
- uniformity of grains
- mouldiness,
- dust
- foreign matter
- broken grains,
- weevil infestation,
- packaging
- overall brewing performance

1.2.3. Are you getting the value for the price you are paying for grains?

- 1.2.4. How do you assess the communication between the brewery and other members of the supply chain?
- 1.2.5. Is the communication line effective enough to ensure smoothness in operations?
2. Do you anticipate any price changes in the next contractual period?
3. What factors would influence a change in price you offer?
6. Can you describe any situation you may have identified that could be a threat to the achievement of the objectives of the project?
7. What do you consider as challenges in the execution of the project?
8. Do you have any particular concerns that you may wish to have addressed?
9. Can you propose any suggestions that could improve the overall performance of the project?
10. To what extent can you substitute imported grains with local sorghum at the moment?
11. What is the prognosis for the coming years?
12. Do you foresee a situation where supply of grains far outstrips your requirement?
13. If such a situation should arise, how would it be managed so that it does not adversely affect the supply chain?
14. How could such a situation be prevented?
15. To what extent are you involved in the selection of sorghum varieties?
16. What are your plans towards the use of malted sorghum?
17. How would the supply chain be sustained after the project implementation period?

8.3.2. Questionnaire For Project Managers

1. How would you assess the progress of the project so far towards the achievement of the set objective of development of a stable and high quality sorghum supply chain that will allow the national beverage industry to substitute imported grains by locally produced sorghum?

Slow Good Very Good

Please comment on the following:

1.1 Stability of the supply chain:

- Is there any consistency in the supply of grains at the present planned level?
- Are supplies delivered on schedule?
- Can the supply of grains be maintained over a long period of time?
- Can the consistency be maintained at increased levels of supply/demand?
- If there is a sudden unplanned rise in demand, can supply cope?

1.2 Quality of the supply chain:

1.2.1. Are you meeting (or even exceeding) the expectations of the brewery?

1.2.2. Does the brewery complain about any of the following?

- Extract yield,
- Uniformity of grains,
- mouldiness,
- dust
- foreign material
- broken grains,
- weevil infestation,
- packaging

If so, how do you plan to address the situation?

1.2.3. How would you assess the flow of communication between

- you and the brewery?
- you and the farmers?
- you and the input providers?
- you and the CFC/UNIDO Sorghum Malt Project?

1.2.4. Is the communication line effective enough to ensure smoothness in operations?

2. To what extent are following involved in the sorghum variety selection?

- Brewery
- CFC/UNIDO sorghum Malt Project
- Farmers

3. How would the following affect the supply of sorghum and how far do consider them as threats to the project?

- Drought
- Fire
- Floods
- Theft
- Pricing
- Pests

4. What measures are in place to manage these?

5. Can you describe any other situations you may have identified that could be considered as threats to the achievement of the objectives of the project?

6. What do you consider as challenges in the execution of the project?

7. Do you have any particular concerns that you may wish to have addressed?

8. Can you propose any suggestions that could improve the overall performance of the project?

9. Do you foresee a situation where supply of grains far outstrips your requirement?

10. If such a situation should arise, how would it be managed so that it does not adversely affect the supply chain?

11. How could such a situation be prevented?

12. What progress has been made towards meeting the following targets which are to be met at the end of the project? Please complete table.

TARGET	April 2006 to March 2008	COMMENTS
1. Three high yielding sorghum varieties for industrial use		
2. At least 20 commercial sorghum seed multipliers operational		
3. 10,000 farmers growing industrial sorghum		
4. 10,000Mt of sorghum used by brewery annually		
5. USD900,000 in seasonal credit/95% credit repaid at due date		
6. Income from sorghum-60% increase in household		
7. 120 private sector agricultural input and services providers trained		
8. 4 credit inventory projects		

13. What are your plans towards sustainability of the supply chain after the project implementation period?

8.3.3. Questionnaire For Farmers

- 1) NAME:
- 2) TYPE OF FARMING ACTIVITY: Nucleus Farmer Out-grower
- 3) LOCATION OF FARM:
- 4) TOTAL SIZE OF FARM:
- 5) HOW MANY ACRES DO YOU CULTIVATE AS AN INDIVIDUAL?
- 6) HOW LONG HAVE YOU BEEN CULTIVATING SORGHUM?
- 7) HOW LONG HAVE YOU BEEN PARTICIPATING IN THE PROJECT?
- 8) HAVE YOU ACQUIRED ANY NEW FARMING SKILLS FROM THE PROJECT?
- 9) IF YES, WHAT ARE THEY?
- 10) WHAT ARE YOU DOING DIFFERENTLY NOW AND WITH WHICH RESULTS?
- 11) ARE YOU HAPPY WITH YOUR PARTICIPATION IN THE PROJECT?
- 12) HAS PARTICIPATION IN THE PROJECT BROUGHT YOU ANY BENEFITS?
- 13) HAS IT BROUGHT ANY IMPROVEMENT IN YOUR LIVELIHOOD?
- 14) IF YES, WHAT ARE SOME OF THE IMPROVEMENTS?
- 15) WOULD YOU LIKE TO CONTINUE PARTICIPATING IN THE PROJECT?
- 16) DO YOU HAVE ANY CONCERNS?
- 17) DO WOMEN PARTICIPATE IN THE FARMING?
- 18) HAS THE PROJECT PLACED THE WOMEN AT ANY DISADVANTAGE?
- 19) IF YES, WHICH ARE THEY?
- 20) WHAT SUGGESTIONS WOULD YOU MAKE FOR IMPROVING THE PROJECT?