

SAFGRAD SHELLER
IMPLIMENTATION PROGRAM IN
UGANDA

6313
USA



Submitted by USAID IDEA Project
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Initial Background documentation requesting support from SAFGRAD

The following represents the IDEA project summary of the activities proposed for SAFGRAD support.

Grain Processing Hubs to Strengthen Producer Organization in support of Rural Access to Markets

Background

Over the past 5 years, the USAID IDEA project has been promoting improved efficiency of production, particularly for small-holder producers of maize and beans. This promotion has been particularly successful with regards to maize, which has been responsive to management (low or no cost inputs) as well as to fertilizers (higher external inputs). Improved seeds in the form of disease resistant open pollinated materials as well as high yielding hybrids have contributed much to the success of this crop.

The USAID IDEA project is a 9-year effort, which has focused essentially on productivity enhancement activities, from research through regional marketing to include small holder growers as the principal target group. The IDEA project has as its goal the raising of incomes at the farmer level. Any activity through the whole commodity system which adds value at the farm level contributes to this goal. The IDEA project has worked at three principal activities – Technology transfer, Input Supply and Marketing. It is only where these three activities overlap that enhanced rural incomes result.

The program has been highly successful by using some innovative interventions. Rather than focus on a single technology package, the project has presented a range of practices that can be adopted in sequence. This has enabled farmers to use what they see as immediately of benefit and are able to afford. Utilising available extension workers rather than import an employed staff has been of significant benefit. Extension workers have for the first time been able to demonstrate something that really works. This has given them a renewed sense of professional pride. Additionally, the level of responsibility given to the district coordinators has moved them to develop really suitable programs for their farming clients.

The technology transfer mechanism in combination with a real response to demand for inputs has lead to the emergence of a growing group of commercially orientated farmers. This is an essential development. Uganda, and other agricultural based economies in Africa must develop a commercial market reputation. The only sustainable way of doing this is to intensify and commercialise the agricultural base.

Commercial farmers have begun to aggregate through real producer lead associations. Their principal aim is to benefit themselves through improved input purchases as well as to generate better opportunities for output marketing. In this way they are able to ensure a sustained production system.

A past USAID Uganda supported the Post Harvest Handling Project (PHHP) developed appropriate equipment and stimulated local capacity to produce post-harvest machinery. However, no support was provided for **commercializing post-harvest technology**. In order to fully utilize the post-harvest project outputs, stimulate the private sector suppliers and get the machinery into the hands of the producer, some additional support mechanism is required. Any support to the output side of the production – marketing chain - would help in ensuring the financial stability of the producer groups.

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Strengthening Producer Organization with Production Support Service

Farmers who have grouped themselves into producer organizations have shown their ability to move from subsistence to commercial production and are now accessing credit from one of two banks recently active in the agricultural sector. The loan program is in the third or fourth cycle and repayments have been excellent. Increased commercialization of these farmers (with farm size averaging 3-10 ha), has stimulated interest in group procurement of inputs, group accessing of credit, as well as group marketing of output. However, as volume increases at the group level, marketing is constrained both by volume of product and by the capacity for processing. Direct market access requires value-added and uniform quality product on a timely basis. There is therefore need for enhanced capacity to process the product at the farm level.

The groups formed to date are typically 40 or 50 farmers with a range 30- 160^{ha}. Although the average area under production varies from region to region, the average size is 4 hectares, cropping twice a year. Aside from technical assistance from the IDEA project, the groups currently do not receive direct financial or material assistance from any donor. The Groups are self-financed and their elected volunteers provide direction within the groups. Typical per group output averages 1000 mt. grain per season, which if processed within 6 weeks can avoid substantial post harvest losses, and enable growers to service loans and carry out production preparation in time for the following season.

Being able to handle the grain centrally through a processing hub puts small-scale growers "on the map." For the first time, these growers have access to the end user, or very close to the end user. Price received by the farmer increases and rural incomes are enhanced. Addressing the needs at the process end forms the final link in the already established production, input supply and marketing chain.

The Approach

- **Producer group formation** under the IDEA strategy has been unique particularly because there are literally thousands of associations formed with the sole objective of accessing donor funds. There has been little or no "grass roots" support for the association for mutual benefit. For the first time since the collapse of the cooperative movement, farmers are seeing the need of associating and are doing so in order to benefit themselves without the promise of financial support or otherwise. The approach - offering income-enhancing technologies to the broad community and then to "watch" groups form has been shown to be a better intervention strategy than to "promote" group formation at the outset.
- The approach to **enhancing efficiencies of production** is unique in that it addresses the needs of what would usually be called an elite group of farmers. Traditionally, developmental assistance would be targeted at the poorest of the poor- those having no resources at all, and being unable to respond immediately in any commercial way. This may lead to few tangible results and no upward spiral in terms of economic growth. The IDEA approach is to address the concerns of the middle of the target group - early adopters who can be effectively used as farmer trainers and motivators. If their peers see these as successful, then a real multiplier effect can be achieved. The middle range farmer is also able to very early on establish commercial off take. This is important in that it develops a commercial core in terms of market. The small scale producer not yet at the level of sustained market orientation has a market on which he can depend. This further encourages his development and more farmers are pulled into the market economy. Even the subsistence grower benefits by being able to place his variable surplus onto an established market chain.

Grant support following a period of self-determined association development would tend to strengthen groups. Farming groups would be deemed to have "made it" if they could sustain market penetration on behalf of their membership with financial benefits. Such groups would serve as excellent role models for newly emerging groups. Of particular importance is support to post harvest handling and processing to market requirements.

Productivity enhancement is clear – farmers who are growing more efficiently would now be marketing as efficiently as possible. Employment opportunities are clearly increased as farming takes on a commercial outlook. Each hectare generates 0.2 full time jobs at the field level and 10% of that at the processing and input supply level. These new opportunities are created at a fraction of the cost in traditional industry and present the only opportunity for employment under Ugandan (and most other African). In this way additional support has a unique opportunity assisting an intervention that has changed totally the way people think about agriculture and opened the way for significantly improved incomes for rural people.

Specific Grant Support mechanism:

The IDEA project has seen the rapid development of these groups. Currently they are at the stage where market penetration is vital for their successful operation. The IDEA project does not have a funding mechanism to support the expansion of successful group processing hubs. Support is required for at least 4 groups to complete the production, marketing linkage. This intervention will enable a complete intervention package.

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Following an indication from SAFGRAD that support was possible for this activity, the following list of criteria was drawn up by the project for inclusion of rural marketing groups (RAMS centers) into the activity.

The following selection criteria was used in group selection

Selection Criteria	Essential	Desirable
Group registered at least at the Local Council Level	•	
Membership Lists Drawn up and Current	•	
Records of Financial Transactions available in at least a basic form	•	
Prior exposure to the use of mechanical shellers		•
Confirmed interest on the part of members to pay for the service	•	
Willingness to Assign and pay for permanent sheller supervisor	•	
Initial producer base per sheller to equal or exceed 200 acres		•
Number of member s per sheller to equal or exceed 40		•
Established links with exporter already in place		•

Following the assessment of criteria for group inclusion, the following was sent as a tender request to suppliers of maize shellers which would be suitable for small group activity.

26th March 2002

Invitation to tender: Maize grain shellers 3/02

The Agribusiness Development Center Kampala is seeking bids from qualified suppliers to supply the following:

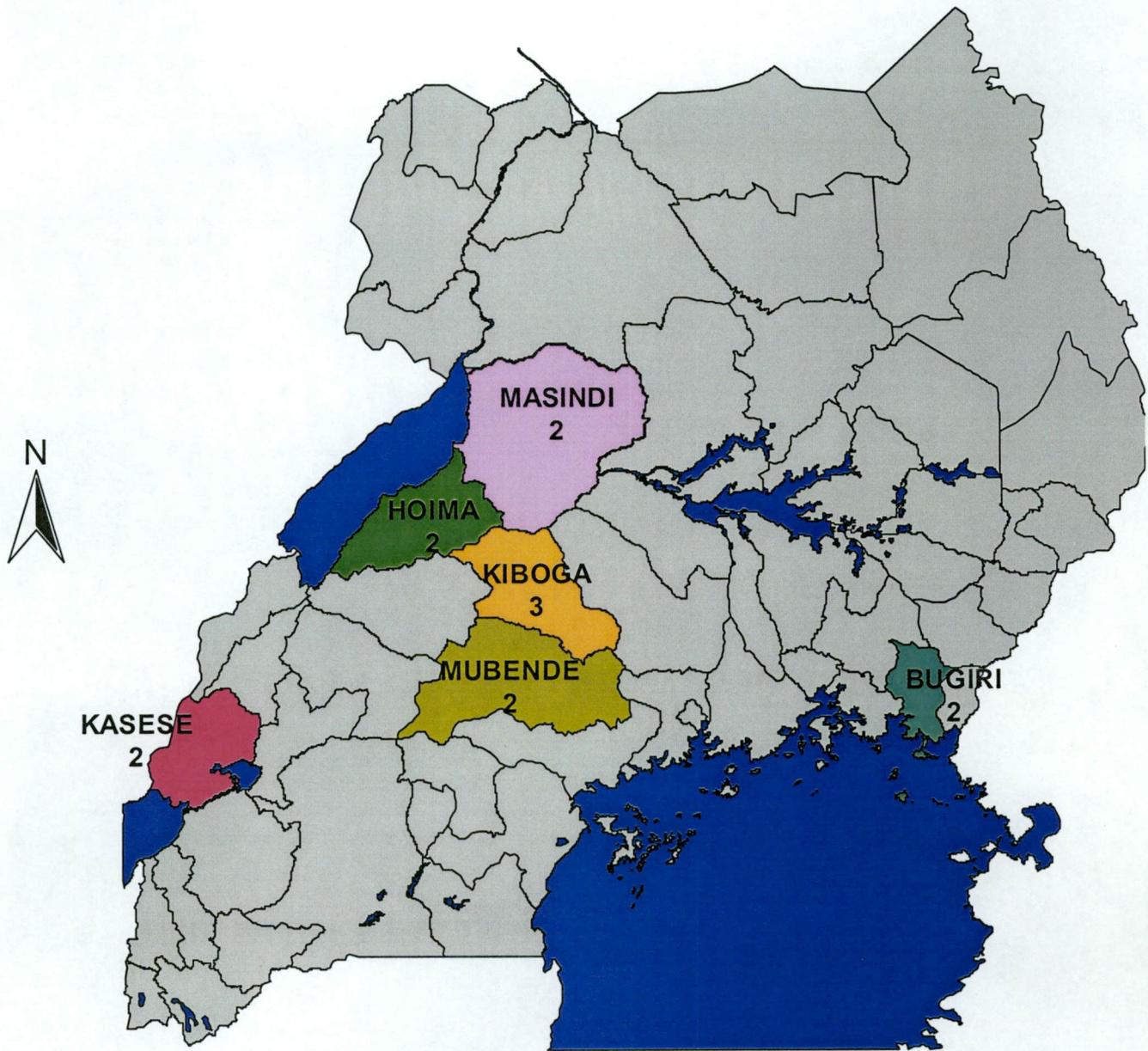
- 12 (twelve) x Maize grain shellers capable of handling maize cobs, which have had their sheath, removed.
- Capacity 1.5-2.0 mt grain per Hour
- Independently powered (diesel or petrol engines)
- Capable of being mobile and not requiring fixed floor mounts.
- Spares for both power supply and sheller for the first year of operation. Assume two periods of operation for two months each. – working 6 days per week 6 hours per day. The equipment will be placed in 4 regions in Uganda – likely Kasese, Kiboga-Mubende, Kapchorwa and Hoima. Three or four units will be placed with each of these areas. The supplier should include in the bid price for each unit, the cost of a one day training on site in machine use and maintenance as well as the cost of 2 routine maintenance visits to each of the 4 sites during the first year of operation. Spares will be maintained by the supplier for these visits and supplied as part of the initial bid price.

The Procurement Manager at the Agribusiness Development Center must receive bids at 18 Prince Charles Drive Kololo Kampala by 1700 Hrs Friday 5th April 2002.

Following the tender process, only one firm was found to be qualified to produce and support maize grain shellers in Kampala. This was a company that had been visited previously by the SAFGRAD representatives. An appropriate purchase order (ADC PO ref 022/2002) was made to JBT Engineering on 23rd April 2002 for the fabrication, supply and training in the use of 12 maize shellers. A Bank account was opened styled SAFGRAD – IDEA Project a/c # 4220271 at Barclays Bank Kampala . It was into this account that the funds (\$25 600 ex SFAGRAD)) were transferred and the account managed. Funds were transferred into the account on 21st May 2002 and closed out on 26th August 2002. (see Annex I) The total number of shellers procured was 13 after evaluating exchange rate gains and performance on the initial procurement. 6 Groups were selected as represented in the following distribution.

- How many farmers are members of each of these groups?
- Brief description of these groups activities before the project.
- Brief mention of what was scheduled to be done through the project (activities?).

GROUP SHELLER DISTRIBUTION – 2002



Source: IDEA Project and FEWS NET, December 20

The Results of the intervention:

The ADC did not dictate the mechanism that was to be adopted by each RAMS operation. The groups were told that the charging mechanism should be competitive with hand shelling in order to attract sufficient throughput, should ensure that all costs are covered and that there remains sufficient funding to cover repairs and maintenance. Depreciation was explained to them. The supplier, as per the ADC contract agreement, trained the groups in proper maintenance of the equipment. Monthly reports were received from the groups and the results are tabulated in table 1 below. All the groups have utilized the machinery except for Mubuku Irrigation scheme, which will begin in January 2003. The only group that was able to utilize the shellers for 2 seasons was Kiboga. It is of interest that the number of farmer benefiting in Kiboga increased by 56% over the 1st season activity.

Location	Shellers	Bags shelled	Number of farmers	Shelling charge per bag	Income season b	Cost incurred	Balance
Gukwatamanzi	2	4,322	58	755	3,259,550	1,313,360	1,946,190
Bugiri	2	1,383	12	200	276,600	-	276,600
Kiboga season 1	3	1,836	82	800	1,468,800	1,156,680	312,120
Kiboga season 2	3	2,066	128	400	826,400	378,900	447,500
Hoima	2	306	5	1,000	306,000	214,900	91,100
Mubende	2	461	11	1,000	461,000	271,000	190,000
Mubuku	2	-	-	-	-	-	-
Totals		10,374	296	4,155	6,598,350	3,334,840	3,263,510

Table 1 Summary Activity as reported by Producer groups

The cost of shelling a 100kg bag of maize grain by hand using sticks to beat the bag of unshelled maize is generally 1000 Ug sh. Charges therefore were all less than the competing rate over the first season. Some groups chose to provide and charge for a full service while others chose to charge a partial rate and make the client pay for fuel, oil and labour in some instances. These differing costings and charge out situations resulted in differing margins and costs as outlined in table 2 below.

Output Analysis	Kg's per farmer	Cost per kg to association	Charge per kg	Margin per kg
Gukwatamanzi	7,452	3.04	7.55	4.51
Bugiri	11,525	-	2.00	2.00
Kiboga season 1	2,239	6.30	8.00	1.70
Kiboga season 2	1,614	1.83	4.00	2.17
Hoima	6,120	7.02	10.00	2.98
Mubende	4,191	5.88	10.00	4.12
Mubuku	-	-	-	-
Average	4,734	3.44	5.94	2.50

Table 2. Analysis of reports by producer group

Gukwatamanzi group from Masindi district obtained the greatest margin per kg processed. They processed more product than any other group (432.2mt) and would therefore have been operating at closer to the installed capacity of the equipment (estimate 60% over the time utilized). Their charge out rate was attractive to the clients, being 75% of the traditional cost by hand.

The lowest margins were obtained by the Kiboga group during season 1. This was due to the high cost of transport incurred by the group in moving the sheller from farmer to farmer. The distances involved are great and the costs were not effectively covered by the charge out rate. This was rectified during season 2, where farmers were asked to arrange and pay for the transport of the machine to their farms. This brought down the cost to the association from 6.3/= per kg to 1.83/= per kg.

Using the average from all groups, but bearing in mind that these performances will be improved with better management based on first season experience, an analysis of financial performance was carried out to determine the viability of a commercial sheller operation. The results are represented in tables 3 and 4 below.

Financial Analysis	
Purchase cost	3,200,000
Amortized over 4 years @ 18%	-1,189,564
Total payment	-4,758,255
Maintenance/kg *	0.69
Depreciation SL 4 years (pa)	800,000
Annual cost loan Rep + Dep	-1,989,564

Table 3. Financial Analysis of performance

* Maintenance calculated at 20% of operating costs

Throughput mt per annum	Maintenance charge	Operating costs	L/Repay	Total cash out	Revenue	Surplus/Defecit	Less Dep
100	68,783	343,917	1,189,564	1,602,264	593,571	-1,008,692	-1,808,692
200	137,567	687,833	1,189,564	2,014,963	1,187,143	-827,821	-1,627,821
300	206,350	1,031,750	1,189,564	2,427,663	1,780,714	-646,949	-1,446,949
400	275,133	1,375,666	1,189,564	2,840,363	2,374,286	-466,077	-1,266,077
500	343,917	1,719,583	1,189,564	3,253,063	2,967,857	-285,206	-1,085,206
600	412,700	2,063,499	1,189,564	3,665,763	3,561,429	-104,334	-904,334
700	481,483	2,407,416	1,189,564	4,078,463	4,155,000	76,537	-723,463
800	550,266	2,751,332	1,189,564	4,491,163	4,748,571	257,409	-542,591
900	619,050	3,095,249	1,189,564	4,903,862	5,342,143	438,280	-361,720
1000	687,833	3,439,165	1,189,564	5,316,562	5,935,714	619,152	-180,848
1100	756,616	3,783,082	1,189,564	5,729,262	6,529,286	800,024	24
1200	825,400	4,126,998	1,189,564	6,141,962	7,122,857	980,895	180,895

Table 4. Financial performance vs Throughput

The assumption that a sheller operation for the group will enhance quality, timeliness and overall response in the market was tested. A commercial loan was assumed to be over 4 years at an annual rate of 18%. The amortisation would have to be covered, as would maintenance and the depreciation charge on the equipment. From the above it is clear that a commercial sheller loan over the period suggested, would be viable (on a cash flow basis only) at an annual throughput of 700mt. This assumes 2 seasons of production and represents 350 mt per season. This is equivalent to 3500 x 100 kg bags. Only Gukwatamanzi achieved this output rate. In the first year of operation. In order to fully cover depreciation, a throughput of 1200mt per annum would be required. This approaches 95% of installed capacity. The following table Outlines the possible performance levels of each machine:

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Assuming 7 week shelling window	Mt per day over 2 seasons	% of installed capacity
100	1.19	8%
200	2.38	16%
300	3.57	24%
400	4.76	32%
500	5.95	40%
600	7.14	48%
700	8.33	56%
*800	9.52	63%
900	10.71	71%
1000	11.90	79%
1100	13.10	87%
1200	14.29	95%
1300	15.48	103%
1400	16.67	111%
1500	17.86	119%

Table 5. Installed capacity

From the work carried out by the SAFGRAD grant activity, it is clear that small-scale maize shellers locally fabricated and utilised by well-coordinated producer groups are an effective tool for post harvest handling and marketing. The machinery is a vital first step in establishing viable rural processing hubs. The groups are able to respond effectively to market demand in terms of quality and quantity. Future work based on the SAFGRAD initiative will develop the processing hubs, with the introduction of dryers and cleaning equipment.

This information will continue to be refined and recommendations will be made to all groups involved as to the most cost effective and profitable ways to operate the machines to maximize benefits to the producers and to the groups as a whole. Additionally, the information will be transmitted to the financial institutions in order to develop a commercial finance mechanism for expanded group access to these machines.

Annex I
Financial Records and Accounts

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African Union Common Repository

<http://archives.au.int>

Department of Rural Economy and Agriculture (DREA)

African Union Specialized Technical Office on Research and Development

2002

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