

Poor farmers in Uganda boost their income with new groundnut varieties

RIU

Validated RNRRS Output.

Farmers throughout Uganda are using new disease-resistant groundnut varieties—validated in on-farm trials—to overcome a rosette disease, a problem that was seriously limiting their yields. Previously, their only recourse was chemical control, but this was too expensive for poor farmers. To make seed of the new varieties widely available, a farmer-led multiplication plan was developed under the supervision of parish development committees. These committees oversee repayment and redistribution of seed to ensure that women and poor households receive priority. Farmer groups also learned improved groundnut production and seed handling techniques, as well as how to process the groundnuts using a manual grinder. Finally, collective marketing associations are building their links to markets.

Project Ref: **CPP03:**

Topic: **5. Rural Development Boosters: Improved Marketing, Processing & Storage**

Lead Organisation: **AT (Uganda), Uganda**

Source: **Crop Protection Programme**

Document Contents:

[Description](#), [Validation](#), [Current Situation](#), [Current Promotion](#), [Impacts On Poverty](#), [Environmental Impact](#),

Description

Research into Use

NR International
Park House
Bradbourne Lane
Aylesford
Kent
ME20 6SN
UK

Geographical regions included:

[Uganda](#),

Target Audiences for this content:

[Crop farmers](#),

CPP03**A. Description of the research output(s)**

1. *Working title of output or cluster of outputs.*

In addition, you are free to suggest a shorter more imaginative working title/acronym of 20 words or less.

Commercial incentives for groundnut production and farmer led multiplication

Alternative Title: Commercial Incentives For Sustainable Groundnut Multiplication

2. *Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.*

This activity was funded by: Crop Protection Programme

With additional support in the first year from DFID Uganda as part of Livelihood Initiative for Eastern Uganda (LIFE) Project 1st July 1999- 30th June 2003.

Additional activities related to value addition were funded by McKnight Foundation and carried out in collaboration with Compatible Technology International out of Minneapolis

3. *Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities.*

CPP R8105 Farmer-led Multiplication of Rosette Resistant Groundnut varieties for Eastern Uganda. 1 February 2002- 31 March 2005

CPP R8442 Commercial Incentives For Sustainable Groundnut Multiplication 1 April 2005 - 31 December 2005

Institutional partners:

Serere Agricultural and Animal Research Institute (**SAARI**)

Dr. C.M. Busolo-Bulafu, Groundnut Breeder,
P.O. Soroti, Tel: 256-77-488727 / 256-77-700261,
Email: cbusolo@hotmail.com, fax:077-280351

Sustainable Agriculture Centre for Research, Extension and Development in Africa (SACRED-Africa)

Dr. Eusebius J. Mukhwana

Executive Director, P.O. Box 2275 Bungoma, Kenya
Tel: 254-55-30788/30293
sacred@africaonline.co.ke

4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? (**max. 400 words**). This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address. Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.

AT Uganda's groundnut work from 2002-2005 was undertaken to address the expressed need of farmers in Eastern Uganda to be able to access planting material of the newly released disease resistant groundnut varieties, in a situation where foundation materials were in exceeding short supply and not being commercially multiplied by the formal seed companies. These resistant varieties had been developed at ICRISAT Malawi and verified for dissemination in Uganda by CPP research conducted by Chancellor and Overfield from NRI (R 7445) in collaboration with NARO, ICRISAT, AT Uganda, and SOCADIDO.

Groundnuts is a staple food in this region with a higher return to labour than any other crop. Production had declined significantly in recent decades, however, because of the increasingly high risk from rosette disease and the lack of suitable planting material. The recommended approach to chemical vector control had proven too expensive for poor farmers whose resulting risk of crop failure was unacceptably high.

The CPP promotion project was therefore designed to enable poor farmers to overcome this problem and reverse the declining trend. Seed availability was enhanced through **farmer-led multiplication of rosette resistant varieties of groundnuts** under supervision of the local leaders. Value addition and marketing activities were included to ensure that increased production could be translated into improved livelihoods for the poor.

The Cluster of Outputs addressed included:

- **Research validation of rosette resistant varieties** through at least 40 **on-farm trials** per season for two years
- **Farmer group evaluation** of trial results to identify varieties with preferred qualities for multiplication
- Development of a sustainable **farmer led multiplication** plan that targeted **poor but able households** and develops a clear sense of local ownership and responsibility for enforcement of the repayment and onward distribution process. Multiplication carried out through farmer groups under the guidance of parish development committees who oversaw repayment and redistribution according to an agreed **multiplication tree** that prioritized women and poor households. Repayment of double the quantities of seed received on "loan" ensured rapid expansion of area under production.
- Farmer groups trained in improved groundnut production and seed handling.
- Value addition through **peanut butter production** was introduced using a manual grinder designed by CTI. Adopting farmers were trained in its use.
- **Collective marketing** associations were formed to enhance market linkages for these organized farmers.
- Farmers were trained on **post harvest handling** to improve marketed produce quality and control **aflatoxin** contamination.

5. What is the type of output(s) being described here?
Please tick one or more of the following options.

Product	Technology	Service	Process or Methodology	Policy	Other Please specify
X	X		X		

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

The main commodity was rosette resistant varieties of groundnut, *Arachis hypogaea*. AT Uganda has, however, successfully used a similar farmer led multiplication process for other self pollinating or vegetatively propagated crops including newly released varieties of cassava, beans and millet.

7. What production system(s) does/could the output(s) focus upon? Please tick one or more of the following options. Leave blank if not applicable

Semi-Arid	High potential	Hillsides	Forest-Agriculture	Peri-urban	Land water	Tropical moist forest	Cross-cutting
X	X	X		X			

Especially if one considers the general methodology for farmer led multiplication or the approach to collective marketing which are not limited to groundnut production in semi-arid area.

8. What farming system(s) does the output(s) focus upon? Please tick one or more of the following options (see Annex B for definitions). Leave blank if not applicable

Smallholder rainfed humid	Irrigated	Wetland rice based	Smallholder rainfed highland	Smallholder rainfed dry/cold	Dualistic	Coastal artisanal fishing
X			X	X		

The marketing approach is potentially useful to any smallholder producers.

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).

Successful implementation of the farmer led groundnut multiplication under R8105 led directly to identification of the need to add value and improve farmer market linkages. AT Uganda became actively involved in promoting local private sector manufacture and distribution of an improved **manual peanut butter grinder** in collaboration with CTI. Similarly, they collaborated with Sacred Africa, to promote the **cereal bank approach to collective marketing associations** in eastern Uganda under R8442. As part of the facilitation of collective marketing, it is important to ensure appropriate **post harvest handling and quality control** to protect consumers against threats such as **aflatoxin**. AT Uganda collaborated with Makerere University and Uganda Grain Millers to train

farmers in post harvest handling and aflatoxin control. Marketing associations were assisted to secure basic drying and grain handling equipment with funding from DANIDA ASPS. Access to **market information** is a critical factor in the success of collective marketing efforts, and collaboration with Foodnet and KACE has been important. To successfully compete with commercial traders, however, the marketing associations urgently need access to revolving loan funds (**inventory credit** schemes) to be able to offer part payment to farmers at harvest to allow them to meet emergency cash needs and still hold product for later marketing at a better price. Each of these additional interventions is essential to successfully address the critical constraints of smallholder farmers, and ensure a significant impact on livelihoods of the poor.

AT Uganda is collaborating with Nkoola Development Associates, SACRED Africa, and IITA on an ASARECA project entitled “Facilitating **Collective Marketing Best Practices** in Kenya and Uganda”. This project seeks to establish a **learning alliance** of promoter agencies to identify and promote best practices in linking farmers to markets. We expect the results of this study to significantly inform our future work in groundnut marketing.

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

AT Uganda’s farmer-led multiplication approach for groundnuts is clearly appropriately clustered with the following RNRRS projects.

RNRRS	Title of output/cluster	Related R Nos	Lead organisation	Lead person	Other partners
CPP	Reducing aflatoxin levels in groundnut	R8483, R7809, R8298	ICRISAT	Dr F Waliyar International Crops Research institute for the Semi-Arid Tropics (ICRISAT) Patancheru 502324, Andhra Pradesh, India Tel: +91-40-23296161 Fax: +91-48455-282828 E-mail: F.WALIYAR@CGIAR.ORG	Dr D V R Reddy/Dr F Waliyar (R7809) Principal Scientist, Genetic Resources and Enhancement Programme, ICRISAT, Patancheru 502324, Andhra Pradesh, India Tel: +91-40-3296161 ext. 2669 +91-8455 82669 (direct line) Fax: +91-40-3296182 E-mail: D. REDDY@CGIAR.ORG
CPP	Rosette resistant groundnut varieties	R7445, R6811	NRI	Dr T Chancellor, Natural Resources Institute	Dr D.Overfield Natural Resources Institute
CPHP	Peanut butter processing	R7419	Development Technology Centre (DTC), University of Zimbabwe,	Rukuni, T (Dr) rukuni@agric.uz.ac.zw PO Box MP167 Mt Pleasant, Harare, Zimbabwe	

Looking at the collective marketing promotion aspect of the work, however, the following projects also form a closely related cluster. It should be noted that AT Uganda has been directly involved in the PMCA work in Uganda for example under R8418.

RNRRS Programme	Title of output/cluster	Related R Nos	Lead organisation	Lead person	Other partners
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<i>CPHP</i>	Farmer access to markets	R8275	Centre for Development and Poverty Reduction, Imperial College Wye, Wye, Ashford, Kent TN25 5AH	Dorward, A (Dr) Imperial College at Wye Email: A.Dorward@ic.ac.uk Tel : +44 (0) 20 759 42679 Fax: +44 (0) 20 759 42838	
<i>CPHP</i>	Farmer access to markets	R8274 R8498	National Post Harvest Programme, Kawanda Agricultural Research Institute, P. O. Box 7065, Kampala, UGANDA	Agona, A (Dr) karihave@starcom.co.ug Tel: +256-41-567708 Fax: +256-41-567649	
<i>CPP</i>	Farmer multiplication systems (potato)	R8104 R8435	AT Uganda Ltd, Plot 1 Muwafu Road, Ntinda, P.O. Box 8830 Kampala, Uganda. Tel: 256-41-285803, Fax: 256-41-285564.	Dr. Rita Laker-Ojok, email: rojok@spacenet.co.ug Tel: 256-077-550958, Fax: 265-41-285564	
<i>CPHP</i>	inventory credit schemes	R8113	Kenya Network for Draught Animal Technology	Kaumbutho P (Dr)	
<i>CPHP</i>	inventory credit schemes	R 6344 R7013 R7668	Natural Resources Institute (NRI) UK,	Dr Gideon Onumah Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, United Kingdom	
<i>CPHP</i>	inventory credit schemes	R8114	Natural Resources Institute (NRI) UK,	Klieh, U (Dr) Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, United Kingdom	
<i>CPHP</i>	inventory credit schemes	R7496	Natural Resources Institute (NRI) UK	Goodland A (Mr) Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, United Kingdom	
<i>CPHP</i>	market information tools	R7151	Centre for Development and Poverty Reduction, Imperial College Wye, Wye, Ashford, Kent TN25 5AH	Poole, Nigel (Dr) Centre for Development and Poverty Reduction, Imperial College Wye, Wye, Ashford, Kent TN25 5AH	
<i>CPHP</i>	market information tools	R8250	Natural Resources Institute (NRI) UK,	Klieh, U (Dr) Natural Resources Institute,	

				University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, United Kingdom	
CPHP	market information tools	R7494	Natural Resources Institute (NRI) UK	Orchard, J (Dr) j.e.orchard@gre.ac.uk Natural Resources Institute (NRI) UK, Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, United Kingdom	
CPHP	market information tools	R8422	Uyole Agricultural Research Institute (UARI), P.O. Box 400, Mbeya, Tanzania. E-mail: uyole@ud.co.tz, nsemwalth@yahoo.co.uk,	Nsemwa, L T HMr & Dr Nick Lyimo nicklyimo@yahoo.co.uk Tel: 255 (0)25 2510363 Mobile: 255 (0)744 895994 Fax: 255 (0)25 2510065	Richard Lamboll and Tanya Stathers Natural Resources Institute, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, UK
NRS	Participatory market appraisal tool	R8084	SAFA, University of Wales	Robert Brook SAFA, University of Wales r.m.brook@bangor.ac.uk	M.S. Subhas Karnatak University, Dharwad, India drmssubhas@gmail.com
CPHP	Participatory Market Chain Analysis (PMCA)	R8182 R8418	CIP, Peru	Devaux, Andre (Dr) Papa Andina, International Potato Center (CIP), Apartado Postal 1558, Lima 12, Peru Tel.: +51-1-349-6017; Fax.: +51-1-317-5326; Email: a.devaux@cgiar.org	

Validation

B. Validation of the research output(s)

10. How were the output(s) validated and who validated them?

Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the “who” component detail which group(s) did the validation e.g. end users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation (**max. 500 words**).

The rosette resistant varieties Serenut 2, Serenut 3R and Serenut 4T were first validated under R7445. The overall objective was to incorporate rosette resistance with other key traits in order to meet the requirements of farmers in the Teso farming system. In addition to disease resistance, the most important traits were identified as being high yield potential, short duration and drought resistance as well as quality characteristics that would meet the requirements of consumers in the market place. On station multi-locational trials were conducted in collaboration with the National Agricultural Research Organization (especially the groundnut research programme at Serere) over a four year period. These on station results were validated through on farm trials in 2001. The trials were conducted across the 3 main districts of the Teso farming system (Soroti, Katakwi and Kumi) involving a total of 24 farmers in each district and 72 farmers overall. Each farmer had 7 varieties; 4 new resistant lines, Serenut 2, Erudurudu (control), and the farmer's own choice. The trials were organised through the District Agricultural Officer in each District, and by two NGO's (SOCADIDO and AT Uganda). The new resistant varieties (12991, 93530, 93535 and 94581) performed well compared to the local control and farmers own choices, even in this season when rosette disease incidence was low. Consequently, in March 2002 ICG12291 and ICGV-SM93530 were officially released under the names of Serenut 3R (93530, R = red-seeded) and Serenut 4T (12991, T = tan-seeded), respectively.

Subsequently, over the three year life of AT Uganda's Farmer Led Multiplication project (R8105) 5,217 farmers (3,650 women and 1,567 men) benefited directly from seed multiplied and distributed through farmer groups under the coordination of the Parish Development Committees. In addition, impact surveys verified that many farmers received seed as gifts, payment in return for labour during harvest and through sale of the surpluses by beneficiaries. The survey conducted in September 2004 estimated that 5,910 farmers purchased seed from beneficiaries and 7,610 obtained seed as gifts or payments in kind. Total number of households, accessing seed as a result of the first phase of the project, is therefore estimated at 17,154. Under the second phase of the project (R8442) an additional 80 groups were trained and seed was distributed to over 2,880 farmers in 2005.

Projections from the 2004 survey results indicated that sufficient seed to plant 3,275.6 hectares had been availed by the project. Of this, 1,092 hectares was direct from the project and 2,183.6 hectares was the result of seed sales and gifts. Estimated production from 2004 alone was judged to be sufficient to plant 4,725.8 hectares. As a result of this extensive multiplication and promotion effort poor farmers accessed the new rosette resistant varieties, adopted improved production practices, resulting in increased groundnut productivity and production.

11. *Where and when have the output(s) been validated?*

Please indicate the places(s) and country(ies), any particular social group targeted and also indicate in which production system and farming system, using the options provided in questions 7 and 8 respectively, above (max 300 words).

The projects were conducted in Eastern Uganda in the Teso and Bagisu farming systems from 1999 to 2005. This area ranges from semi-arid lowland to rolling highland on the lower slopes of Mt. Elgon.

Through the projects, 4 NGO programme staff, 16 government extension staff with their 15 field assistants, 1,470 community leaders, and more than 8,000 farmers from 400 groups in 5 Districts were trained in groundnut production, storage and multiplication. 6,000 copies of simplified groundnut production guides were distributed thus enhancing dissemination of production practices.

Participatory poverty assessment verified that the project beneficiaries were widely representative of the parent communities with over 52% of the group members falling within the poorest to poor category. First priority for project seed distribution was given to women and poor households with the result that 85% of the project seed distribution went to poor households (70% women). Undoubtedly, however, much of the seed sold was purchased by better off households.

Current Situation

C. *Current situation*

12. *How and by whom are the outputs currently being used? Please give a brief description (max. 250 words).*

A recent follow-up visit to the project area revealed that farmer-led multiplication and redistribution under the leadership of the Parish Development Committees is still continuing. In most subcounties, an additional 10 to 15 partner groups have received seed since the end of the project in December 2005. A rough estimate would indicate therefore that approximately 3,000 additional households have either received seed or are in line to receive seed before the next planting season. It was encouraging to learn that in many areas even the training of new groups by the PDC's is continuing. Some of the project trainers have now become farmer facilitators under NAADS.

In locations where NAADS has recently begun operating in area neighbouring the project, the demand for resistant varieties has been strong. Other NGO's such as VECO (Vredislander Coopibo) have adopted the AT Uganda approach to farmer led seed multiplication in several locations in Eastern Uganda. In addition, some of the subcounties have elected to use their Poverty Alleviation Funds from central government to launch similar multiplication schemes at the local government level.

Most of the marketing associations are still struggling to continue to operate and market produce on behalf of their members. Several of them have obtained contracts to supply NAADS, or other NGO's with seed in addition to selling on the local consumer market. They are seriously constrained, however, by lack of capital to enable them to pay cash down payments to members at harvest.

13. *Where are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used (max. 250 words).*

The rosette resistant varieties have enjoyed widespread adoption in all the major groundnut growing areas of Uganda.

14. *What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading (max 250 words).*

There are no national statistics to tell us what proportion of the groundnut market in Uganda is filled with Rosette

Resistant varieties. It is clear, however, that the proportion is growing rapidly.

A 2005 study by IFPRI [1] found that adoption of improved groundnut varieties had reached 13% in the first NAADS Districts, 9% in the second tier of NAADS districts and 7% in the non-NAADS districts by 2004.

A recent study by CRS [2] found that 83% of households in Gulu, Kitgum and Pader Districts of Northern Uganda were growing groundnuts. This is an area that has suffered from extensive displacement and political instability for the last 20 years with nearly 1.6 million people displaced into IDP camps. Groundnut production is on the rise because it is a high-value crop, with about 35% of production sold. Groundnut production is expanding because it is a crop that can relatively easily be converted to cash, and because it is short in stature and favoured for security reasons. Serenut 4 and Serenut 2 are widely grown alongside a number of local varieties.

Increasingly the new rosette resistant varieties are also dominating the commercial seed production. Uganda has 7 local seed companies all of whom have access to foundation seed from NARO. Between 2003 and 2005 groundnut seed sales rose from 130mt to 288mt while the proportion of red beauty seed sold fell from 69% to 7% and conversely the rosette resistant varieties contribution to seed sales rose from 31% to 93% (USTA 2005 [3]).

[1] Benin, S., Nkonya, E., Okecho, G., Pender, J., Mugarura, S and Kato, E. (2005). Quantifying the impact of the National Agricultural Advisory Services in the Uganda Rural Livelihoods. NAADS Household Survey, Study supported by World Bank via NAADS.

[2] CRS, 2005. "SEED SYSTEMS OF ACHOLILAND, NORTHERN UGANDA: AN ASSESSMENT" Consultants report. Limited Distributor.

[3] Tibaijuka, B and B. Bua. 2005. Technical Report on The Development of the Seed Database. USTA. Kampala. Mimeo.

15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success? (max 350 words).

The technology is being promoted by the **National Agricultural ADvisory Services (NAADS)**. NAADS was launched in July 2001 in the six districts of Arua, Kabale, Kibaale, Mukono, Soroti and Tororo. In the second year, 2002/03, the programme expanded to 10 more districts of Bushenyi, Busia, Iganga, Kabarole, Kapchorwa, Kitgum, Lira, Luwero, Mbarara and Wakiso. In many of these first 16 Districts groundnuts production was popular. When it came time to selecting the three priority enterprises for NAADS extension groundnuts was selected by a total of 36 of the first 177 subcounties (20%), making it 6th in popularity after poultry, bananas, goats, piggery and bee keeping. In Tororo (SE Uganda) groundnuts was declared a "strategic enterprise" for the District. Other areas that have rapidly adopted the new varieties under NAADS include Busia, Kamuli, Soroti and Arua.

Since 2002 the IFAD Vegetable Oil Development Project (VODP) has also been supporting Serere to multiply the rosette resistant varieties.

In northern Uganda Serenut 4 was introduced to the area by CRS for testing on farmers' fields. It proved disease resistant, high yielding and popular with farmers. CRS began distribution to collaborating farmers and active dissemination through seed vouchers and fairs. Other organizations began to distributed it. Serenut 4 has now become one of the most popular groundnut varieties in Gulu district and is making inroads in Kitgum and Pader. The relatively high rate of adoption of improved varieties by farmers is undoubtedly due largely to the widespread distribution of seed by various organizations [4].

In summary, the technology is being encouraged by the following institutions/situations:

1. NAADS system of enterprise promotion with Private Service Providers
2. Extensive seed aid in Northern Uganda, including free seed distribution and seed fairs managed by international bodies and NGO's.
3. The rapid growth of commercial seed companies producing seed for the aid and relief markets

Through these mechanisms it is reaching a broad spectrum of small holder producers. Much emphasis has been on distributions that target women, poor households and the displaced.

[4] in 2005 alone, AVSI, OXFAM and World Vision all distributed Serenut 2 and Serenut 4 groundnuts to displaced households in Northern Uganda. Number of beneficiaries is probably in excess of 56,000 households but quantities distributed to each was quite small. Serenut 4 was also a very popular variety in the CRS seed fairs.

Current Promotion

D. Current promotion/uptake pathways

16. Where is promotion currently taking place? Please indicate for each country specified detail what promotion is taking place, by whom and indicate the scale of current promotion (max 200 words).

See section C. above.

17. What are the current barriers preventing or slowing the adoption of the output(s)? Cover here institutional issues, those relating to policy, marketing, infrastructure, social exclusion etc. (max 200 words).

1. While NAADS groups are fairly effective in extension they have not provided an effective forum for collective marketing activities. Most farmers lack the necessary skills and access to market information to effectively bulk and wholesale their production [5].
2. The previously mentioned capital constraints are also a problem for the marketing groups. Most farmers cannot afford to hold their crop in order to secure higher prices later in the season. Failure to address these constraints will limit participation in collective marketing and reduce benefits to farmers.
3. The widespread relief market has significantly distorted the seed industry which is hostage to unpredictable relief orders. Widespread seed distribution has expanded awareness of the varieties at the expense of continuity in foundation seed production, seed quality. Much of what is distributed as relief is grain that has simply been treated and bagged by the seed companies. This can be substantiated by the fact that only 26 kg of foundation seed has been handed over to seed companies in the last three years (13kg Serenut2 and 10kg Serenut3 in 2004). The National seed certification service reports having inspected just over half as much acreage as the seed companies harvested (Tibaijuka and Bua, 2005).
4. The ubiquitous relief effort has undermined commercial input distribution mechanisms for seed and other essential farm inputs. The network of input stockists in Uganda is weak and farmers travel long distances to

purchase inputs.

5. There is high demand for red seeded varieties. Serenut3R has a slow multiplication rate due to the tendency to rot when harvested under wet conditions. Yield is also negatively affected by late planting and highly inconsistent. Much of what is distributed as Serenut 3 is actually a non-resistant local variety which it closely resembles.
6. There is also some indication that the rosette resistance of Serenut4, which is resistant to the vector, may break down during seasons of high disease pressure.

[5] Pound, B., Adolph, B., Uli Kleih, U. and Manzi, J. 2005 Working Document on Current Market Information Systems for the NAADS Enterprise Selection Process (Participatory Planning Process) Report to DFID Crop Post-Harvest Research Programme, Project R8421 (Zb0371)

18. What changes are needed to remove/reduce these barriers to adoption? This section could be used to identify perceived capacity related issues (max 200 words).

1. Greater emphasis on facilitation of collective marketing, especially building on the learning alliance approach to identification of best practices.
2. The marketing groups need to be facilitated to initiate aggressive savings mobilisation to build a capital fund for part payments to members who sell through the collective groups. This needs to be supplemented with a revolving capital fund similar to that established for the cereal banks in Kenya by Rockefeller Foundation. There is also a need for aggressive links to larger players in the market, and regular access to market information.
3. Efforts to strengthen the seed production and distribution system, including improved access to foundation seed, closer monitoring by NSCS and strengthening the rural input distribution system. Replacement of free relief distribution with a vouchers for work programme that enables poor households to earn vouchers to purchase the improved inputs of their choice. This approach, funded by DANIDA and implemented by AT Uganda and Uganda National Agro Input Dealers' Association, simultaneously strengthens the input distribution system while encouraging private sector market participation.
4. Continued work on identification and testing of additional resistant varieties is needed, with an emphasis on the red seeded varieties demanded by the market.

19. What lessons have you learnt about the best ways to get the outputs used by the largest number of poor people? (max 300 words).

If community multiplication systems are to effectively reach large numbers of poor and female headed households, then empowerment of the local authorities to enforce a systematic mechanism for repayment of multiplied seed, and redistribution to other group members with first priority given to poor households is essential. Too many government multiplication schemes are simply give away programmes that reach a limited number of lucky households in the first round and then stop.

While giving seeds away is the fastest way to get it into the hands of people, if the varieties are to be maintained,

available to farmers on demand, and the quality assured, then the commercial seed production, certification, and distribution systems have to be strengthened. The vouchers for work approach seems to be an excellent way to promote adoption of improved production practices by vulnerable households. To strengthen demand, however, access to income by poor households, has to be supported with intensive farmer training so they can see for themselves the potential benefits of adoption and have the necessary skills to do so effectively.

If farmers are to have the necessary incentives to adopt they must have access to profitable markets for the surplus at fair prices. To strengthen the farmer's hand with respect to marketing they must have readily available market information, skills in collective action, and sources of capital for inventory accumulation.

Impacts On Poverty

E. Impacts on poverty to date

20. Where have impact studies on poverty in relation to this output or cluster of outputs taken place? This should include any formal poverty impact studies (and it is appreciated that these will not be commonplace) and any less formal studies including any poverty mapping-type or monitoring work which allow for some analysis on impact on poverty to be made. Details of any cost-benefit analyses may also be detailed at this point. Please list studies here.

Tino, G., R. Laker-Ojok, and S. Namisi, December 2004, Impact Assessment Report for Farmer Led Groundnut Multiplication in Uganda. AT Uganda. Mimeo

Eusebius Mukhwana, Vitalis Ogemah and Miriam Kuloba. Dec. 2005. Evaluation of Farmers Marketing Initiative Activities Implemented by AT Uganda, Sacred Africa

Bagnall-Oakeley H. 2005. Gross Margin Training Course. NAADS: Kampala

Benin, S., Nkonya, E., Okecho, G., Pender, J., Mugarura, S and Kato, E. (2005). Quantifying the impact of the National Agricultural Advisory Services in the Uganda Rural Livelihoods. NAADS Household Survey, Study supported by World Bank via NAADS.

CRS, 2005. "SEED SYSTEMS OF ACHOLILAND, NORTHERN UGANDA: AN ASSESSMENT" Consultants report. Limited Distributon.

ScanAgri Ltd. 2005 Mid Term Evaluation Survey. Cited by Adipala, E., and Brown M. (2005). "Four years of NAADS Implementation Programme Outcomes and Impact".

21. Based on the evidence in the studies listed above, for each country detail how the poor have benefited from the application and/or adoption of the output(s) (max. 500 words):

- *What positive impacts on livelihoods have been recorded and over what time period have these impacts been observed? These impacts should be recorded against the capital assets (human, social, natural, physical and financial) of the livelihoods framework;*

There is increased consumption of protein due to increased availability, hence improving nutrition of entire household members. 64% of ATU project beneficiaries reported improved nutrition.

Increased incomes as there was extra to sell as groundnut is a high value crop in the region. Increased production translates to increased surplus for sale since the varieties never fail because they are also drought tolerant especially serenut 2 and 4.

Increased use of resistant varieties eliminated need for use of chemicals to control aphids that spread the disease.

Strengthening of social capital through group activity for joint problem solving. distribution of seed has continued in most places through the PDC and production committees set up for seed multiplication.

In the ATU impact study at the end of phase one 28% of project beneficiaries reported buying physical assets as a result of increased income from sales of surplus groundnuts produced. This also agrees with the high numbers that sold seed. Income from sales helped beneficiaries to access essential household necessities and also buy bicycles, land, building materials and livestock. These are major sources of investment in rural areas and also a popular form of saving.

23% of the beneficiary households reported improved health as a benefit from the project. 18% reported increased incomes and 16% cited better education. All of these benefits involve cash expenditure therefore indicating increased availability of cash incomes as a result of the project.

- *For whom i.e. which type of person (gender, poverty group (see glossary for definitions) has there been a positive impact;*

The able poor were able to access the improved groundnut seed and produce their own crop. Women benefited since food crops are mostly handled by women and they were targeted as beneficiaries. Generally the entire household benefited from improved nutrition and greater access to protein and essential fatty acids. The well-to-do were also able to buy seed on the open market and expand production. Generally those who were targeted and accessed seed especially the poor and women, improved their production and were able to have surplus to sell.

- *Indicate the number of people who have realised a positive impact on their livelihood;*
By the end of 2004 income from groundnut sales of 2,734 direct ATU project beneficiaries had totalled over 170 million shillings and this was at a time when seed was still relatively scarce and households were keeping most of it for replanting.

Since that time, all 20,134 ATU project beneficiaries plus many neighbouring farmers who have accessed the varieties have experienced improved livelihoods. Beneficiaries increased production and had lots of surplus for sale as seed and grain as a result of higher yields compared to those growing local varieties.

- *Using whatever appropriate indicator was used detail what was the average percentage increase recorded*

Increase in area production of the new varieties in the target group , from zero to 4725.8 hectares.

Increase in yields new varieties generally higher compared to other varieties although impact study data was not formulated in such a way as to measure actual change in yield.

NAADS reports that in 2005, farmers in Arua district, realised a 3-5 fold yield increase through planting improved groundnut varieties (Serenut 2 and 3) and have organized themselves for purposes of marketing. From the revenue, some farmers have constructed a groundnut store while others invested in a solar dryer to further improve the quality of their produce. The NAADS Midterm Evaluation by Scanagri [6] estimated a 238% yield increase by groups adopting rosette resistant varieties under NAADS.

Early adopter groups have been well placed to earn substantial profits from sale of the improved seed. Several of the ATU marketing groups have secured contracts to provide seed to NAADS under ISFG. The earliest farmer groups in Soroti (NE Uganda), have benefited significantly as suppliers of groundnut seed throughout the country. NAADS reports that some 3,000 farmers from 210 farmer groups in Busia District in Eastern Uganda have adopted new groundnut varieties giving rise to US\$ 70.2 million whilst in 2005 alone 200 farmers in Kamuli District South Central Uganda generated US\$ 56 million from sales of improved groundnut seed.

[6] ScanAgri Ltd. 2005 Mid Term Evaluation Survey. Cited by Adipala, E., and Brown M. (2005). Four years of NAADS Implementation Programme Outcomes and Impact.

Environmental Impact

H. *Environmental impact*

24. *What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? (max 300 words)*

This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.

Use of rosette resistant varieties implies no use of chemicals to control the aphids that spread the virus which causes the disease. This means potentially reduced use of chemicals. However this does not rule out the use of chemicals in case of other pest attacks especially the leaf miner which is becoming important.

On the other hand since groundnuts is a legume that fixes its own nitrogen extensive cultivation of the crop will contribute to fertility enhancement from residual nitrogen and reduce use of artificial nitrogen fertilisers.

25. *Are there any adverse environmental impacts related to the output(s) and their outcome(s)? (max 100 words)*

There are no adverse environmental issues of concern.

26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience? (max 200 words)

The varieties promoted are tolerant to drought a common phenomenon in the farming system in the areas where the project was implemented in the past decades. This makes them appropriate for the poor since irrigation is not possible in many areas. It also means that they are able to get a crop to survive on where other crops fail. By eliminating the threat of rosette, the yield variability is greatly reduced and the risk faced by poor farmers is minimized.
