RIU

New techniques multiply success with potatoes

Validated RNRRS Output.

A new method for multiplying potato tuber seed is helping poor smallholders to overcome a deadly potato disease known as bacterial wilt. The seed production system includes field inspection and on-farm detection of bacterial wilt. Collective marketing activities through a new Seed Producer Association are ensuring that the increased production translates into improved livelihoods. The members of the association have acquired skills in marketing and post-harvest handling. Simple potato storehouses are preserving tuber quality and extending product life. Local committees control distribution of the seed potatoes to ensure that all members receive their fair share, giving priority to women and poor households. The successful techniques have now spread to farmers in Kenya and Uganda.

Project Ref: **CPP02:**
Topic: **1. Improving Farmers Livelihoods: Better Crops, Systems & Pest Management**
Lead Organisation: **AT (Uganda), Uganda**
Source: **Crop Protection Programme**

Document Contents:

Description

CPP02

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.

Farmer multiplication systems (groundnut/potato)
This is the title used in the list of all programmes for purposes of preparing the pro-forma.

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

Geographical regions included:

Kenya, Uganda,

Target Audiences for this content:

Crop farmers, Processors,

(Please note that neither of these projects dealt with groundnuts. Groundnut multiplication and marketing is being dealt with in another pro-forma for R8442 R8105 under the title "Commercial incentives for groundnut production and farmer led multiplication".)

Alternative proposed title:
Sustainable Potato Seed – Tuber Management and Marketing Through Commercialization

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 support for quality management training was provided by DANIDA ASPS.

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 R8104 **Promoting Potato Seed-Tuber Management For Increased Ware Yields in Kapchorwa District, Eastern Uganda.**

CPP R8435 **Sustainable Potato Seed-Tuber Management and Marketing through Commercialization**

Institutional partners:

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*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.*

These projects addressed the expressed need of farmers in the highlands of Eastern Uganda to access **Bacterial Wilt [*Ralstonia solanacearum*]** disease free planting material of the newly released Victoria variety of potatoes. The work built on earlier efforts in Kenya under R7858 which demonstrated the benefits of using clean **seed-tubers** [1]. AT Uganda had failed to promote potato production due to the lack of **disease free planting materials** for **large scale dissemination** to farmers.

Marketing constraints were also recognised including the absence of a **market pull** to command a **price differential** between formal and informal seed, and constraints in **marketing of ware potatoes**. Collective marketing activities were therefore included to ensure that increased production would translate into improved livelihoods.

The Cluster of Outputs addressed included:

- ***Research validation*** of **small seed plot system** for application in Eastern Uganda through ***on-farm trials.***
- Establishment of **Kapchorwa Seed Potato Producers Association** (KASPPA) to multiply **quality assured seed potato** of the new varieties on a commercial basis. KASSPA assisted to acquire clean seed, and trained in **Best Practice multiplication** of basic seed including monitoring and testing for BW. Grading system for seed potato established included coding to track identity of supply farmers, sorting by seed size, and selling seed potato according to the number of tubers per bag.
- **Branding** of **KASPPA** as a seed potato producer through use of the KASPPA logo and bag
- This **traceable system of seed production** put in place a farmer-based **decision framework for pest thresholds [voluntary standard]**. Field inspection and **on-farm incubation** were validated as methods for farmer detection of bacterial wilt within seed lots and used to determine acceptance/rejection of material as suitable for planting.
- Parish Development committees controlled the distribution of the seed potatoes to group members to ensure that women and poor households were given priority, and that all groups members got their turn to receive seed potato. Recipient farmers were trained in **farm level multiplication of BW free seed potato**. Simple **diffused light stores** introduced for improved sprouting and storage of seed potatoes.
- ***Collective marketing*** associations were formed to enhance market linkages. Groups were assisted with **constitution** development and trained in **association management**, **market information**, and **financial controls**.
- Marketing associations were trained on ***post harvest handling*** to improve produce quality. Simple **improved ware potato stores** to retain tuber quality and extend product life introduced with the help of CIP.

[1] The term seed potato is used, but technically this project cluster delivered tubers of a recommended size and low pest status suitable for planting.

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 potato, with specific emphasis on Bacteria Wilt Control and marketing of quality assured seed potato.

The seed quality and traceability outputs are widely applicable to other vegetatively propagated crops were pests are transmitted with planting material and the practice of farmer-saved planting material are dominant over formal systems. Similarly, the procedures and lessons learnt in establishing KASPPA and the farmer marketing collectives have generic value to associations supporting other commodities.

These outputs can be applied to any system where a quality product supported by a voluntary standard is appropriate and can command a higher market value through promotion and collective marketing by an association.

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 with respect to the approach to collective marketing which is more general and not limited to potato production which is more specifically highland oriented.

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*		

Especially with respect to the approach to collective marketing which is more general and not limited to potato production which is more specifically highland oriented.

*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 small seed plot system for seed potato multiplication under R8104 led directly to identification of the need to improve farmer market linkages to capture improved prices and open new marketing channels for potato farmers in Kapchorwa. AT Uganda sought collaboration with Sacred, Kenya, to promote the cereal bank approach to collective marketing associations in Eastern Uganda under R8435. Farmer groups were mobilized, assisted with constitution development and registration, trained in collective marketing, financial management, and product handling. As part of the facilitation of **collective marketing**, it is important to ensure appropriate post harvest handling and adequate **quality control** for marketed produce. AT Uganda collaborated with Makerere University and the Uganda Grain Millers Corp. Ltd. to train farmers in post harvest handling and aflatoxin control for their maize which they also planned to market collectively alongside potatoes. For potato, **post harvest handling** emphasis was placed on dehaulming, sorting, and grading to minimize rotting in the store. Marketing associations were assisted to secure basic drying and grain handling equipment with funding from ASPS. AT Uganda also collaborated with CIP Kenya to introduce improved table potato storage to extend the marketable life of the Kapchorwa produce.

Each of these additional interventions is essential to successfully addressing the critical constraints faced by smallholder farmers, and ensuring a significant impact on the livelihoods of the poor. Access to **market information** is a critical factor in the success of collective marketing efforts. In this regard, 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 needs and still hold product for later marketing at a better price.

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 multiplication approach for quality assured seed potato multiplication is clearly appropriately clustered with the following RNRRS projects.

RNRRS	Title of output/ cluster	Related R Nos	Lead organisation	Lead person	Other partners
CPP	Sustainable potato seed tuber management	R8435, R8104, R7856	Central Science Laboratory, Sand Hutton, York TO41 1LZ	Dr Julian Smith, Plant Pathologist, Plant Health Group, CSL Tel 01904 462415 FAX 01902 462111 julian.j.smith@csl.gov.uk	AT Uganda Ltd. on R8104 and R8435
CPP	IPM potato pests in Hilliside system Bolivia	R8443, R8044		Ing. Rayne Calderón, & Dr. Javier Franco, calderon@proinpa.org ; jfranco@proinpa.org Av. Blanco Galindo km. 12.5, calle C. Prado s/n Casilla: 4285, Cochabamba, Bolivia Phone: 00591 44 360800 -/360801; Fax: 00591 44 360802	
CPP	Strengthening technical innovation in potato based agriculture	R8485, R8182	International Potato Center, Apartado 1558, Lima 12, Peru	André Devaux CIP Tel: 51-1-3496017 Fax:51-1-3175326 e-mail:a.devaux@cgiar.org	G Thiele
CPHP	Participatory Market Chain Analysis (PMCA)	R8182 R8418		Devaux, Andre (Dr) CIP, Peru 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	**AT Uganda** was one of the partner organizations in the implementation of the PMCA approach for potatoes in Uganda under R8418.

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 for potatoes in Uganda for example under R8418.

RNRRS Programme	Title of output/ cluster	Related R Nos	Lead organisation	Lead person	Other partners
CPHP	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	
CPHP	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	
CPP	Commercial incentives for groundnut production and farmer led multiplication	R8442 R8105	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	
CPHP	inventory credit schemes	R8113	Kenya Network for Draught Animal Technology	Kaumbutho P (Dr)	
CPHP	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	
CPHP	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	
CPHP	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	

CPHP	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	
CPHP	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.	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 NRI, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, UK

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)**.*

Main method of validation/adaptation of outputs has been done by stakeholders in a participatory manner. Participating stakeholders have included:
End users: farmers,
Intermediary service providers: NAADS field personnel including those they contract,
Development partners/NGOs: Africare in Kabale, Kisoro and Rukungiri districts, CARITAS, Africa 2000 Network in Kabale, Private sector: INSPPA,

National Agricultural System: NARO)
For further details see table below.

*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)**.*

Targeted social group - Farming communities that practice mainly subsistence farming although most of the produce is used for cash generation. Production system - entirely rain-fed. Farming system - highland. Farmers grow potato-sorghum/maize- beans and sweet potatoes.

Question 10a ***How Validated***	*Questions 10 b* ***Who Validated***	*Question 11a* ***Where***	*Question 11b* ***When***
For Small seed Plot Technique and other BW control measures			
The small seed plot technique was validated by on-farm trials. The technique utilizes intensive management of bacterial wilt in potato fields by disease-free seed, cultural practices (rouging, destruction of diseased seed or plants, sterile farm equipment, non-host crops) and use of field plots with no previous history of bacterial wilt. Tuber numbers were significantly greater in the high planting density. The reduction in seed costs and low bacterial wilt disease levels were significant motivating factors which enhanced the desire of potato farmers to utilize the seed-plot technique for bacterial wilt management. **Ref**: Kinyua, Z.M., Olanya, O.M., El-Bedewy, R., Smith, J.J., Crissman, C. 2005. Seed-plot technique: empowerment of farmers in production of bacterial wilt-free seed in Kenya and Uganda. Bacterial Wilt, The Disease and Ralstonia Solanacearum Species Complex. APS Press, St. Paul, Minnesota, USA, pg 510	Julian Smith (CABI) and Z. Kinyua (KARI) under **R6629 & R7858.**	Kenya and Uganda	*1998-2002*
The project promoted the on-farm small-scale seed potato production system [SSPS] validated under CPP R7858. The project was built on the established Farmer Field Schools [FFS] and UNSSPA with support from National Agricultural Research Organization (NARO), Kachwekano Agricultural Research and Development Center (KARDC), Africare and CIP. The strengthening of linkages between formal and informal seed lines represented a central theme. The Project activities was to engage the National Agricultural Advisory Services [NAADS] in evaluating the prominence of potato in Kabale and in determining the policy, technical and infra-structural needs for scaling-up the formal and informal small-scale seed systems. Based on these justifications long-term uptake pathways for improved seed health for Uganda will be developed with local and national government, alongside international donors.	Kinyua *Africare/ CIP* **CPP R8016**	*Kabale in Southwest Uganda*	*March 2002-April 2003;*
13 demonstration sites were established (one per subcounty under R8104 and then 1 per parish under R8435). Each site had two varieties i.e. Victoria and Nakpot 5, and the two seed production methods of the SPS, and the ridge furrow for both seed multiplication and ware potato. Use of fertilizer was included in the demonstration design. At each demonstration site, five field days were organized at; planting, one month after emergence, flowering, dehaulming and harvest. The project worked with a total of 60 farmer groups from 7 subcounties. 1,410 of the trained group members received seed for multiplication for their ware production under R8104. Under R8435 an additional 315 farmer group members benefited. Farmers were given the choice of multiplying their quality assured seed using either **Small Seed Plot** technique or **ridge furrow** technique for the	*AT Uganda working with Julian Smith (CABI/ CSL)* **R8104 &*R8435***	*Kapchowa District Eastern Uganda*	*Jan 2002-Dec 2005*

seed plot. The multiplied seed was then used the following season to produce sufficient quantities of ware potatoes. Some seed was to be reserved to plant a new seed multiplication bed. Farmer groups were largely representative of the rural community with 42% in the poor to very poor category. 60% of the beneficiaries were women.			
For Collective Marketing			
The Cereal Bank approach was first developed for use by smallholder maize producers. Five Cereal banks were open to promote collective marketing of maize. Members were trained, linked to larger markets, assisted with transportation, and provided with a credit fund to purchase produce from members.	*SACRED Africa funded by Rockefeller Foundation*	*Bungoma District Western Kenya*	*2003-2005*
Beginning in 2004 the number of cereal banks was expanded to 20, with a membership of over 1500. The range of marketing activities expanded to address varied local farming opportunities including higher-value horticultural products and fertilizer marketing.	SACRED Africa in collaboration with Rural Outreach Program, Siaya Community-Oriented Development Project and Resource Projects Kenya	All located in Western Kenya in Bungoma, Mumias-Butere, Siaya and Vihiga Districts respectively	2004-2006
Potato collective marketing feasibility study conducted by SACRED Africa. 4 Potato Marketing Associations were established with a total of 156 paid up members as of December 2005. Members bought shares in order to create a capital base for the associations. Members were trained in association management, quality control, book-keeping, and project planning. All four associations were registered with the district, opened bank accounts, and established central stores for produce. Social and gender breakdown not available for marketing group composition.	*AT Uganda in collaboration with SACRED Africa* ***R8435***	*Kapchorwa District, Eastern Uganda*	*2005*

Current Situation

C. Current situation

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

Question 12a ***Output and How Used***	*Questions 12b* ***By Whom***	*Question 13* ***Where***	*Question 14* ***What Scale***
Best Practice protocols for seed production by medium sized landholders [primary multipliers]			
Best Practices use by KASPPA. A visit to KASPPA in Oct 2006 substantiated the protocols use outside of project support by 50% of KASPPA members. Notably KASPPA members within Kaproron sub-division were effectively using the scheme. KASPPA executive committee procured Victoria seed potato for some members from Buginyanya RDC and are preparing themselves to buy more seed for next season (2007A).	KASPPA [Kaproron sub-division]	Kapchorwa, Uganda	Approx. 14 of the 28 KASPPA members
Field incubation for Bacterial Wilt	As above		

Acceptance/rejection of seed based on pest thresholds: In discuss with the KASPPA farmers [Oct 2006] its was apparent that KASPPA was not selling seed outside the association but operating a Safe Haven environment for the movement of seed amongst members	KASPPA	Kapchorwa, Uganda	KASPPA members [28]
Further, aspects of the scheme have influenced the national seed programme at Kabale that now actively sorts and sells seed by size categories and is more aware of traceability of produce. These are being promoted with UNSPPA (Uganda National Seed Producer's Association.	NARO	Kabale, Uganda Branches are being formed in Kanungu and Kisoro (SW Uganda)	UNSPPA members = 42 (14 most active) Produce 1,000 bags of seed per year.
Seed Plot Technique			
The SPT has been exposed to farmers in Kenya [Njabini] and Uganda [Kabale & Kapchorwa]. Its use has remained as intended: for the safe multiplication of seed tubers by smallholder farmers with limited access to land and good quality seed, providing a flush-out mechanism for seed that lessons the impact of home saved seed practices. No direct measures of adoption are available, however, the following appears to be a realistic measure of adoption at the institute and farm level	Farmers trained by AT Uganda Farmer's trained by NARO, Africare, and Africa 2000 Network	Kapchorwa District in 7 subcounties In Kabale District	
Institute level: The SPT is reported as a central part of the training activities routinely provided by NARO [Uganda] and forms a component of the ASARECA project IRC04_C4-05 implemented in Kenya, Ugandan and Burundi.	NARS and NGOs	Kenya, Uganda &, Burundi	Demonstration plots and FFS
Farm level: No quantitative date is available. It is reported that farmers within Kabale use the method. In Kapchorwa,we estimate that of the 1,725 small scale farmers trained, about 40% are using seed plot system to multiply their own seed while 60% use the ridge/furrow system. This seed is used to raise their own seed for subsequent ware production. Adoption of the SSP method has been strongest among new producers, and those from less hilly areas. More experienced potato producers, and those in the steeper areas prefer to adapt the ridge/furrow ware potato method to the needs of seed production including pegging/rouging for disease control, dehaulming, early harvest, and exclusion of tubers surrounding pegged areas. Potato production for all regions has increased as a result of the projects. By example in Njabini the farmer groups involved in the project are now an association called Jetegemee Agriculture and General Development self Help group [JAGED-SHG] that continue to actively produce potato seed and ware.	Farmers	Kenya, Uganda	Not known
KASPPA members are providing extra services like advice on farm level seed multiplication and proper management of the potato crop to their customers (farmers). KASPPA has submitted a tender to become the private sector service provider to NAADS to supply seed and to offer training to Kaproron sub-county which selected potato as a promoter enterprise.	KASPPA members	Eastern Uganda	Ongoing
Farmer Associations and Community communication structures			

Marketing Associations: The Kapchorwa marketing groups are still buying and selling produce using the marketing working committees which were put in place. They are using the little capital they collected by selling shares to the members to buy produce i.e. maize, beans, and wheat from farmers. They buy unsorted produce. The produce is stored in the central store after being sorted and dried to the required moisture content. The produce is sold locally to the mobile traders and individual farmers who buy for their home consumption. The marketing groups have regular meetings to update the members on the business transactions and they are still managing their books of accounts. They have not been trading in potatoes because the perish ability of the commodity was more difficult to handle.	Farmers Marketing Initiative Groups	Kapchorwa, Uganda	156 members
Similar association active in other Districts in Eastern Uganda dealing with Groundnuts	Farmers Marketing Initiative Groups	9 Districts in Eastern Uganda	719 Members
Nyabumba Farmers' Association actively engaged in collective marketing of ware potato to NANDOS fast food restaurant	Farmer with assistance from Africare & CIAT	Kabale	141 Members
Cereal Banks in Kenya actively engaged in collective marketing of maize and other commodities.	SACRED Africa in collaboration with Rural Outreach Program, Siaya Community-Oriented Development Project and Resource Projects Kenya	Located in Western Kenya in Bungoma, Mumias-Butere, Siaya and Vihiga Districts respectively	Over 1,500

*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).***

See table above

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

See table above.

*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 current policy platform in Uganda is the Policy for Modernizing Agriculture (PMA) issued in 2000. The some of the strategies to achieve the PMA objectives are:

- Greater stakeholder involvement and ownership of the planning, implementation and evaluation of programmes.
- Supporting the spread and uptake of profound technologies. Addressing food security issues through the market rather than through self-sufficiency.
- Addressing the gender issues in the public service design and delivery.

These strategies are a marked improvement over the last ten to fifteen years in terms of public support of all Ugandan farmers and in support of new technology and in moving beyond a subsistence economy.

The implementation of AT Uganda's CPP projects was participatory in nature, involving different key stakeholders such as local farmers, extension staff, sub-county local authorities, NAADS and Research institutions. The local farmers are organised in group working committees with defined roles to ensure effective implementation. The extension staff are trained to provide technical backstopping to farmers. The sub-county local authorities are

involved in monitoring and evaluation of the activities to ensure success and sustainability. The NAADS programmes help to promote potato farmers who are performing well by identifying and advising them to secure quality potato seeds. NAADS has identified KASPPA as their potato seed source, and have recommended it to farmers in Kapchorwa and other districts where NAADS has programmes. This has made it easy for KASPPA farmers to sell their seeds. Research Institutions like Kalyegyere and Buginyanya play a role of ensuring the quality for foundation planting materials and advising farmers to use the best seed potatoes to maximize their potato production.

As a result of all of these activities, the NARO potato programme has more or less mainstreamed training in the use of small seed plot technique for small scale farmers in all its development activities i.e., where ever there is any experiment for potato improvement, SSP is demonstrated.

The approach has also been adopted by the farmer field schools in Kabale and this has been very useful in enhancing the adoption of SSP.

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).***

SSP promotion in eastern Uganda is undertaken by KASPPA members. NAADS is also promoting SSP but the scale of the NAADS promotion, is currently limited to one sub-county in Kapchorwa. KASSPA seed multipliers cover two sub counties in the central part of Kapchorwa district and are within easy reach of the farmers.

UNSPPA is involved in seed multiplication and promotion in Kabale with support of Kachwekano ARDC.

In Kabale district the FAO funded project “TAG 652” executed by NARO and Africare under the supervision of CIP is promoting SSP. 80 females and 60 males from 12 “Farmer groups” are involved.

SSP is also promoted by an ASARECA funded project entitled “Enhancing utilisation of quality seed potato by small scale farmers”. It is being implemented by KARI National Agricultural Research Laboratories, CIP, NARO and Institut des Sciences Agronomiques du Burundi (ISABU). In Kanungu district, Uganda, 10 farmer groups with a composition of 120 females and 82 males are involved. The project is also being implemented in Kenya and Burundi at a similar scale and will run for two more years.

Collective marketing promotion is being supported by NGO’s working on a range of crops in various parts of Uganda.

*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)**.*

MAAIF has failed to develop a coherent certification scheme for seed tubers. The private sector cannot realistically supply certified planting materials whilst seed health standards require a zero tolerance for bacterial wilt. Basic seed continues to be produced by the NARO potato programme, a situation that limits availability and inhibits private sector participation. Seed multipliers therefore have a problem getting enough basic seed from NARO. The basic seed is also costly especially when transport is considered.

NAADS lack of forward planning creates problems. NAADS service providers cannot predict when they will get funds for seed procurement. When money comes, they suddenly want large quantities, in excess of the available supply, and they resort to buying untested tubers from the local market.

Inadequate sensitization of the small scale farmers on the importance of disease free planting materials is a problem in most areas of the country.

For marketing groups, the main challenge is limited working capital. This constrains them from buying produce in bigger quantities and storing for later marketing at better price. The Groups' inability to pay cash for produce at harvest forces members to sell to commercial traders even when they get much lower prices in the long run.

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).***

Adoption is good where farmers have been trained, but large numbers have not been reached. Need to scale up/out the dissemination of the technique. More mass media forms of farmer education should be undertaken.

A coordinated effort is required to plan production and funds disbursement well in advance in order to ensure that quality planting materials are availed at the right time and in the right quantity.

The multipliers need a revolving fund to enable them to purchase the seed and repay later after harvest.

The research station should be encouraged to work more closely with the private sector – taking the lead in appropriate certification rather than direct production.

The marketing groups need access to revolving loan funds (inventory credit schemes) to be able to offer payment to farmers at harvest when prices for the produce are low and store the produce for later marketing at a better price.

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).***

Training of the farmer groups using FFS approaches is effective but expensive.

Emphasising the approach of participation of key stakeholders (i.e. the beneficiary farmer groups, production committees (PC) and Parish development committees, extension staff and sub county local government authorities), in planning, implementation and monitoring the project activities helps in ensuring sustainability of the process because the responsibilities are widely distributed calling for collective accountability. Success has already been noted where key stakeholders' involvement in implementation and monitoring of seed distribution was carried out to help the poor farmers.

Furthermore, it is important to give the target group (poor people) the opportunity to choose their own local leaders within the groups. This gives them a sense of ownership and empowers them to take on responsibility for the implementation process. For example, under this project the local leaders together with the farmers drew up a distribution plan of seed distribution among the poor farmers and were able to monitor to ensure that the members receive the seeds successfully.

Training of trainers approach provides technical skills to all the stakeholders through scaling out and thus giving an opportunity for poor farmers to access the knowledge and each beneficiary (poor farmers) was provided with a farmers' guide on potato production.

Setting demonstrations helps farmers to learn by seeing and to follow the recommended practices. Joint field visits to the stake holders at the demonstration sites promotes participatory learning and free exchange and sharing of ideas.

Joint review meetings and seasonal evaluation helps all members to come together and assess the progress and make necessary adjustments to ensure successful implementation.

Collective marketing approach where poor farmers are involved through affordable membership fee and shares deposit in form of produce helps to ensure participation of a large number of poor farmers, but it is essential that there own capital be supplemented with revolving loan funds.

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.

Under the DFID funded LIFE project, a poverty assessment survey was carried out within the same community where the potato projects were then implemented. The community itself set the criteria for categorising the wealthy status of group members as “very poor”, “poor”, “rich” and “very rich”. The study found that the 1,600 group members were were largely representative of the rural community with 42% in the poor to very poor category. 60% of the beneficiaries were women.

A impact survey was conducted at the end of R8104 to assess the impact of the project on cropping system, diet, wealth to the beneficiaries and non-beneficiaries in Kapchworwa district, Uganda. A total of 116 beneficiaries and 240 non-beneficiaries were surveyed. Impact Survey Report on Promoting Potato Seed Tuber Management for increased Ware Yields in Kapchorwa, Eastern Uganda. *Sarah Namisi, Rita Laker-Ojok, and Julian Smith December 2004. Draft Report not published.*

The Cost-benefit analysis of seed potato production in Kapchorwa was calculated with KASPPA seed multipliers in a participatory manner with technical guidance from the project. The production cost of seed production for one acre was found out to be 8,681/= per bag (11,000/= per bag when marketing costs were included). With the value of seed averaging 25,000 this resulted in a net profit per bag of 14,000/=, a very high return on investment.

At the end of R8016 in Kabale, 120 group members participated in a final project evaluation. The results are presented in the Final Technical Report.

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;*
- *For whom i.e. which type of person (gender, poverty group (see glossary for definitions) has there been a positive impact;*
- *Indicate the number of people who have realised a positive impact on their livelihood;*
- *Using whatever appropriate indicator was used detail what was the average percentage increase recorded*

Under R8104 more than 1,400 farmers were taught how to multiply clean seed potato and trained in improved potato production. According to the R8104 impact survey conducted in 2004, potato was ranked third after maize and beans respectively as a source of livelihood in these subcounties of Kapchorwa in contrast to 2002 before the project, when it was ranked forth (maize, beans, banana and potato respectively). In terms of food security, potato gained preference as a staple food among beneficiaries with a consumption of once to twice in a week compared to the pre-project period when potato consumption was rare. Eighty one percent of the respondents indicated that the project had promoted food security for the households as potato is also a short-term crop that is harvested during the hungry period before the main maize crop is ready.

It was noted that the potato project activities had influenced significantly the incomes of farmers. For instance in 2002 potato accounted for 34% of the household income of the beneficiaries but by 2004, with the influence of the project, potato production accounted for 74% of the household incomes. Forty two percent of the respondents reported selling potato to earn cash, which they used to improve the health of their families and to educate their children in better schools. For example, 23% of the multipliers and 21% of the beneficiaries had purchased assets such as livestock, furniture, land and houses.

83% of project beneficiaries surveyed reported an increased standard of living since the start of the project in 2002, compared to only 55% among

interviewed neighbouring non-beneficiaries. The primary project benefits reported included acquiring training in improved production, access to high yielding new potato variety to increase their food security, improved markets and resulting increases in household incomes. Benefits were achieved by men and women alike.

Results of the R8016 evaluation indicated that 52% of respondents had adopted at least one new potato production technology in the previous three years and they cited improved profitability as the reason.

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.

Potato is a cover plant with plenty of leaf cover, which helps in the control of soil erosion by reducing the direct impact of rain drops on the soil and by controlling the run-off. Thus in areas where it is grown the rate of soil erosion is less pronounced compared to areas under maize for example. This is in addition to the contribution to the ecological cycle through decomposition of the leaf cover.

The project has an elaborate programme of managing bacterial wilt, which is both a seed and soil borne disease, and late blight that have the potential to attack and devastate other solanacae family plants. The farmers have been trained to monitor, identify and test the potato crop for BW by carrying out regular field inspections, uprooting any identified BW infected crop, staking the infected point and by ensuring that they buy clean seed. In case of late blight, they spray with fungicidal chemical. By managing the diseases, other plants in the solanacae family that contribute to the environmental wellbeing are protected from the spread of the disease. To avoid heavy post harvest losses and consequent disposal related environmental dangers, farmers are taught on how to effectively manage post harvest handling of the crop.

Through the collective marketing programme, farmers are also trained on how to ensure quality control especially in managing ground nuts and maize aflatoxins, which are lethal to animal health when consumed.

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

Bacterial wilt disease has high resilience, is very prolific, has no chemical control and is both seed and soil borne, making it easy for it to spread quickly if not managed in time. The disease can wipe out the whole potato crop in no time resulting in zero yields. Thus promotion of potato production without a systematic plan for disease management and multiplication of clean planting materials would result in serious environmental impacts. This is why this output is so important to protect against such contamination.

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)***

Because potato is a short-term crop, the farmer is able to harvest at least some potatoes after a short time even with less rain registered within the growing period. This addresses the key periods of food shortages in the area. Potato being a tuber crop it can withstand strong stormy conditions which normally flatten crops like bananas and maize. This and other edaphic factors make it a suitable crop for poor people that assists them to spread risk.
