

Agricultural development among poor farmers in Soroti district, Uganda: Impact assessment of agricultural technology, farmer empowerment and changes in opportunity structures

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Abstract

This paper is based on participatory development research carried out in Soroti district of Uganda with the aim to assess the impact of agricultural development among poor farmers. The central argument in this study is that a *combination* of farmer empowerment and innovation through experiential learning in FFS groups and changes in the opportunity structure through transformation of LGA staff, establishment of sub-county farmer fora, and emergence of private service provider, has been successful in reducing rural poverty. Based on an empirical study of successful adaptation and spread of pro-poor technologies, the study assesses the well-being impact of agricultural technology development in Soroti district, Uganda. It further analyzes the socio-economic and institutional context under which pro-poor technologies are adopted by poor farmers.

1. Poverty alleviation and smallholder agricultural development

Poverty prevails in Sub Saharan Africa. The proportion of absolute poor people in Sub Sahara Africa has remained about half the regions population during a 20 years period from 1981 to 2001. However, because of population growth, the number of absolute poor almost doubled from 164 million in 1981 to 316 million in 2001 (Bhorat, 2005). Poverty is largely a rural phenomenon and is often more severe in rural areas than in urban centres (Dorward et.al. 2004). In East and Southern Africa, rural areas with high potential for production and marketing accommodate the majority of poor people, while poverty is deeper in semi-arid or otherwise marginal rural areas (IFAD 2000).

Technically, the productivity, household food security and income of a large proportion of these poor farmers could be substantially higher. Smallholder agriculture has not provided a base for improved livelihood because its potential has not been fulfilled. The performance of the rural poor as producers and traders is dependent upon their access to productive resources (land, labour, technology, capital and productive assets) and their knowledge to use those resources effectively and sustainably.

While the importance of non-agricultural activities is increasing in rural areas, smallholder agricultural technology development still holds the greatest potential for

poverty reduction (IFAD 2002a). The rural poor are engaged in low-input low-output production systems with disjointed research, production and marketing relationships. Inadequate participation of farmers in agricultural technology development is in part responsible for the inability of farmers in many parts of Africa to take advantage of improved agricultural technology. Agricultural technology development among smallholder farmers is very uneven and the effectiveness and relevance of agricultural services are key explanatory factors (Friis-Hansen 2003).

Natural and social science agricultural research that supports smallholders' sustainable use of natural resources and improves productivity comprises a crucial component in a strategy for alleviating poverty (Rip and Kemp 1998). However, what constitutes pro-poor technology remains a contested issues in the rural development debate and one in which a wide range of opinions exists (). What technologies are relevant for poor smallholder farmers is highly dependent on general economic and agricultural sector specific policies. The actors involved in determining what constitutes relevant technology were in the past largely agricultural researchers, extension agents, politicians, parastatal input supply organisations, donor agencies and others, while farmers themselves have had little influence on the content of externally supplied technologies. Direct or indirect subsidies, combined with various forms of pressure from state organisations, ensured farmers partial adoption of promoted technologies.

Focus on poverty in the mid 1990s among CGIAR and other international and national agriculture research institutions led to a change in paradigm for agricultural technology development. Agricultural researchers in East and Southern Africa have over the past 10-15 years increasingly changed their research methodologies towards greater involvement of farmers and other stakeholders with an aim to enhance the relevance of research for local specific socio-economic and agro-ecological conditions of production and marketing (Friis-Hansen and Kizauzi 2004).

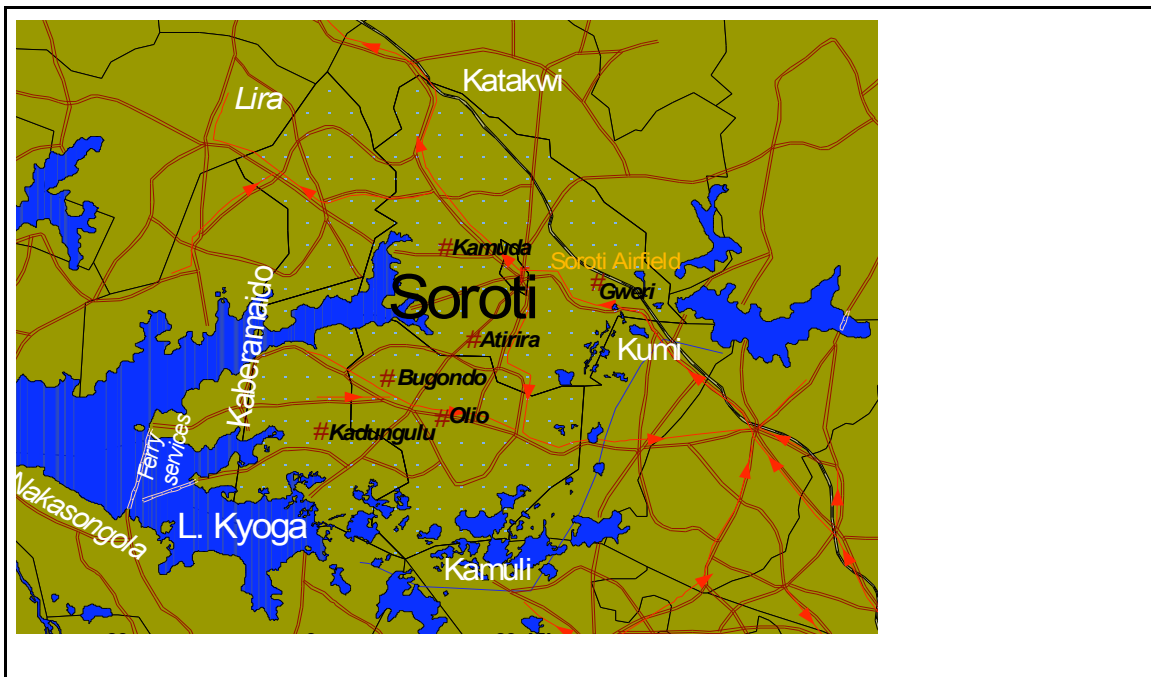
In East and Southern Africa, the support for participatory agricultural research produced a range of pro-poor technologies that are well targeted the resource endowment and farmers systems of poor farmers (IFAD 2001, Egelyng 2005). A range of technologies developed through participatory processes that target poor smallholder farmers have emerged over the past decade from the CGIAR and other agricultural research organizations. In East Africa, many of these technologies are local adaptations of broad ecological principles that enable farmers to use available natural resources more effectively (e.g. integrated pest fertility management, and integrated soil fertility management, participatory plant breeding and variety selection, etc.).

A recent knowledge management review of IFAD investment in technology development in East and Southern Africa conclude that (i) where pro-poor technology has been adopted by smallholder farmers, it seems to be highly appreciated, however (ii) spread of pro-poor technologies have been slow and the vehicle of dissemination has largely been area-based donor financed projects, rather than market forces (IFAD 2001).

Understanding why some agricultural technologies have major impact in terms of increasing productivity and reducing poverty and spread like bush-fire, while other technologies fail to be adopted or disseminate slowly, has long been discussed by agricultural researchers and development practitioners. After a decade of involvement by CGIAR and NARS in participatory agricultural technology development processes, questions have rightly been asked about its effectiveness and poverty alleviating impact (Egelyng 2005). While participatory technology development without doubt has proven to be a sound way of enhancing the relevance of agricultural technology for the participating farmers, its impact on reducing rural poverty is less clearly documented.

This study was undertaken in response to this gap in knowledge and available methodologies. It is based on fieldwork undertaken in Soroti district, Uganda in 2001 and 2004 (see figure 1). Smallholder agricultural development has experienced considerable success over the past decade, in spite of the fact that Soroti district is characterized by unstable rainfall and poor soil fertility.

Figure 1: Soroti District Boundary, sample sub-counties and Infrastructure.



Source: CAAG Uganda ACT foundation dataset, (Collins *et al* 2000).

The study seeks to understand the institutional context that has enable agriculture technology development among smallholder farmers. One the one hand the study examines the changes in opportunity structures, i.e. the responsiveness, quality and relevance of agricultural advisory services provided by the public and private sector. On the other hand the study analyzes changes in farmer empowerment, i.e. the capability of farmers to effectively articulated informed demands for advisory services.

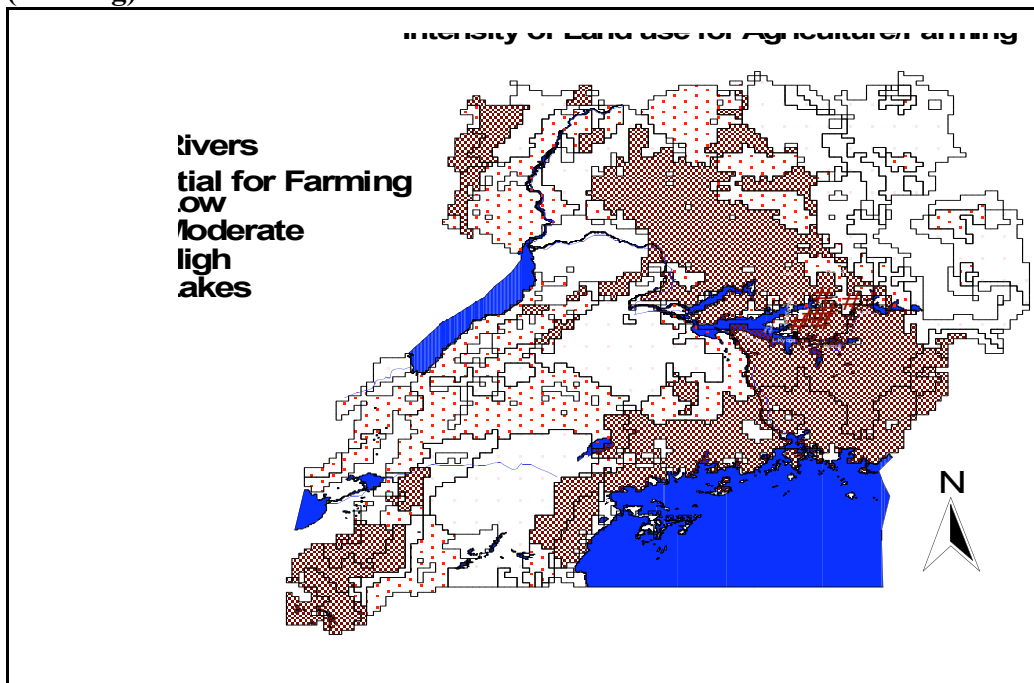
The study furthermore assesses how agricultural technology has been adopted by poor farmers and how it influence well-being among members and non-members of farmer groups. Apart from project based monitoring and evaluation studies, few comprehensive impact assessment activities have been carried out in association with spread of pro-poor technology in East and Southern Africa. The understanding of poverty in these impact assessment studies is furthermore often instrumental, providing an inadequate understanding of technology adoption processes and pathways out of poverty.

2. Smallholder agriculture development and its institutional context in Soroti district

Development of smallholder agriculture in Soroti district

Soroti district is located in Eastern Uganda and has been a test bed for many agricultural development initiatives. The district has a land area of 3,715 square kilometres; traversed by numerous swamps and other ravine wetlands. Annual rainfall totals are between 1100-1200 mm but rainfall reliability is often poor leading to frequent draughts and floods. The soils are to a large extent, poor, shallow and light textured with large sandy loam contents. Farming is the predominant occupation but farm incomes are still low, therefore the access to new markets and technological innovation are key elements in reducing rural poverty. The Teso farming system, which comprises of Soroti, Kumi, Katakwi and Kaberamaido districts, supports a varied range of cash and food crops, placing the districts in the system among the highest agricultural performers in Uganda

Figure 2. Map of Uganda showing land in active agriculture use (farming).



Source: CAAG Uganda foundation dataset (Collins *et al* 2001), generated using ArcView GIS 3.2

During the eighties agriculture was depressed by civil war and dramatic de-stocking as a result of major cattle raids by pastoralists during the late 1980s and early 1990s further undermined agricultural development. Smallholder agriculture in Soroti district has, however, experienced growth since the mid 1990s. The past decade has been characterised by peace, improved access to market opportunities, and improvements of local government structures, including reform of the institutional context influencing smallholder agriculture.

Based on discussions with key informants among local government administration (LGA) and farmers, the study identified three policies and programs that have strongly influenced the rural institutional context that underpin smallholder agriculture in Soroti district; (i) the Local Government Act 1997; (ii) the Farmer Field School programme 1999-2002; and (iii) the NAADS program initiated in 2002. The implications of these policies for changes in opportunity structures and farmer empowerment will be examined in the following.

Framework analysing smallholder agricultural development in Soroti district

Empowerment enables people to influence decision processes and undertake transformative actions, which help them improve their livelihoods (World Bank trilogy “Voices of the Poor” 1999, 2001, 2002). At the same time the contemporary use of “empowerment” seeks to identify power in the capacity of people to increase their self-reliance and individual strengths rather than in terms of a more political concept that stresses the relations between individuals and between groups. Based on a recent policy study (Friis-Hansen 2004) this study adopt the following definition of farmer empowerment: *“A process that increases the capabilities of smallholder farmers and farmer groups to make choices and to influence collective decisions towards desired actions and outcomes on the basis of those choices”*.

Knowledge and organisation has been identified as the most important aspects of farmer empowerment (Friis-Hansen 2004). Farmers’ knowledge empowerment enables farmers to understand the causes and effects of their own agricultural problems and to articulate their technology, extension and development needs as informed demands. Knowledge empowerment allows farmers to actively participate in the planning, implementation and evaluation of services, in effect transforming them into clients, managers and/or owners/partners, rather than passive beneficiaries. Farmers’ organisational empowerment is realised when farmers are organised in groups that are coherent, independent and sustainable. Such groups can enable farmers to articulate their informed demands and interact with state institutions and private sector. They are also the basis for joining/establishing higher-level farmers’ organisations that could represent their interests at local government and national policy level.

While farmer’s individual capabilities are important factors in achieving improvements to his or her livelihood situation – e.g. increased income from production, improved service

provision, they do not alone determine these development outcomes. These are also dependent upon the conditions present for engaging in production, for accessing services and resources, for controlling assets. Such conditions are structured by the policies, rules, practices found in social and economic institutions and not least the policies of the government. These we term “opportunity structures”¹ and they *provide the context in which farmers act and influence the development outcomes achieved* (Friis-Hansen 2004). Opportunity structures tend to be structural in nature and institutionalised in terms of law, cultural and social practices, and not least economic and political interests.

Changes in opportunity structures in Soroti district

The three policy changes identified in the previous section influenced the opportunity structures of smallholder agriculture in Soroti district in the following ways: (i) Enhanced responsiveness of extension services; (ii) Institutional transformation of LGA Agricultural Staff; and (iii) Emergence of private sector agricultural service providers. These changes in opportunity structures are briefly discussed in the following.

Institutional transformation of LGO extension staff. Soroti district, like all districts in Uganda, was decentralized in accordance with the Local Government Act 1997. Political and financial powers have been devolved to district and sub-county levels bringing services nearer to rural people. The central government roles were largely reduced to policy formulation, coordination, standardization and regulation of services.

However, unlike most other districts, Soroti extension department viewed decentralization as a chance to gain independence from the top-down centralized Training and Visit (T&V) inspired unified extension system that treated farmers as passive recipients of externally formulated technology packages in form of extension messages and demonstrations (Friis-Hansen 2004).

The department of extension started a process of institutional transformation in 1996 which aimed at changing attitudes and modes of operation that were rooted in the conventional T&V extension method. This independence appeared to have stimulated innovativeness among extension staff with resultant designing of some crude but workable farmer-managed programmes, which began to empower farmers to advocate for their development rights through participatory bottom up planning processes (Interview with extension staff).

With the support from a Dutch funded Client-driven extension project, district level public extension staff were assessed by farmers and rewarded accordingly by management. Parish Agricultural Development Committees (PADEC) comprising 5 locally elected farmers functioned as ‘para-extensionists’ and interacted a LGA field extension worker (FEW). Through a mix of carrots and sticks the District Agricultural Officer encouraged a gradual change in the relationship between PADEC and FEW, with PADEC taking on more tasks and the FEW being increasingly held responsible towards

¹ The concept of opportunity structures is further discussed in a WB discussion paper (not yet published) in relation to monitoring farmer empowerment.

the PADEC. FEW were given logbooks indicating the task and activities of the FEW that should be assessable during working hours by PADEC. FEW were to earn incentives according to their performance monitored through appoint scoring system relating to activities completed and other indicators such as the logbook, and review by PADRC and exam results of participatory training sessions (Interview with extension staff).

Responsiveness of advisory services. The NAADS programme in Soroti is being implemented under the Uganda government policy of decentralisation. Soroti is a decentralised district with 14 rural sub counties and 1 municipal council. Each sub-county is a decentralised unit of governance able to plan and mobilise resources for its development activities. NAADS is currently being implemented in 13 out of 14 sub counties.

NAADS is based on farmer groups managed through farmer representatives at sub-county and district levels known as Farmer Fora. The sub-county Farmer Forum consisting of 15 members has a chairman, a secretary and a procurement sub committee of 7 members. The District Farmer Fora is made up of chairmen of sub-county farmer fora. Likewise, the National Farmers Forum draws representation from the district chairpersons. NAADS is managed at the national level by a secretariat and a board, overseen by the Ministry of Agriculture Animal Industry and Fisheries (MAAIF). At the district and sub-county, District and Sub-County NAADS Coordinators coordinate the programme respectively. Sub-County and District Councils monitor supervise and guide the operations of the programme.

Technology generation, enterprise development and market linkages are key outputs of NAADS. The key components include; Advisory and information services to farmers; development of private sector institutional capacity; improving the programme management capacity; quality assurance of services delivered and improving technology and market linkages for farmers.

With the establishment of sub-county farmer fora, members of NAADS groups gained in principle an opportunity to effectively articulate knowledge and technology needs and to influence the selection of agricultural service provider. In practice an NGO is hired by the District NAADS coordinator to facilitate the sub-county farmer fora's need-identification and enterprise-selection. A review of progress reports from these NGOs' during 2002-2004 reveal that a tedious process of needs articulation is undertaken in which all NAADS groups express the knowledge and technology needs, which is consolidated at Parish level and presented during a sub-county farmer fora meeting, in which the facilitator and district NAADS coordinator participates. However, the review of progress reports reveal that the decisions taken at this meeting regarding enterprise selections often disregard the need-articulation by the various NAADS groups. The reason given is that the NAADS implementation manual, issued by the NAADS secretariat in Kampala, state that the selected enterprises has to be 'commercial'. This has been interpreted by the NGOs' and NAADS coordinator to mean that only purely commercial enterprises such as bee-keeping, cultivation of cotton, establishment of fruit trees, etc, can be supported. The result has been that many, if not the majority, of knowledge needs articulated by NAADS

groups has been disregarded. The most popular need expressed is for example technologies to improve cultivation of cassava. However cassava is not regarded as a commercial crop.

The study thus shows that the process of enterprise selections is systematically biased towards technical advice for commercial enterprises. This limits the responsiveness service providers to knowledge needs articulated by NAADS groups, which again cause frustration among farmers and may, if allowed to continue, undermine farmers trust in the demand-driven advisory service model.

Emergence of private sector service providers under NAADS. A highly supportive LGO in Soroti district has been conducive to the establishment of an enabling environment for establishment of private sector in response to new opportunities provided by the NAADS policy. Ten private agricultural advisory companies emerged in Soroti district between 2002 and these companies are all relative small (less than 15 employees). They typically carry out short term contracts of the duration of a few months at a time for sub-county farmer fora. NAADS district coordinator assists the sub-county farmer fora in the formulation of terms of reference. All terms of reference are displayed on the notice board of the district NAADS office and tendered to the private service providers. There seems to be a healthy competition between the different service provider companies, although they have all clear capacity limitations and are only able to carry out a limited set of assignment in a given period (interview with NAADS coordinator).

The sub-county farmer fora show a tendency to place increasing demands on quality of work carried out by the private service providers. The service providers' work is monitored by a sub-committee of the sub-county farmer fora. These reports indicated that such a participatory monitoring system is proving to be efficient. The simple monitoring reports give several examples on farmers' disappointments over services provided leading to changed behaviour of the service provider or in some cases termination of the contracts.

Interviews among employees of the private service providers paint a picture of general satisfaction among staff. In particular young extension graduates working for private service provider express satisfaction for having to respond to farmers instead of the district extension officer.

Farmer empowerment and innovation

The farmer field schools approach was introduced into the district between 1999-2002 under the East African small sub-regional pilot project for farmer field schools (financed by International Fund for Agricultural Development (IFAD) and implemented by the Global IPM Facility Project under the auspices of FAO).

The objectives of FFS in Soroti district include: (i) Increase the expertise of farmers to make logical decisions on what works best for them, based on their own observations of experimental plots in their FFS. (ii) Establish coherent farmer

groups that facilitate the work of extension and research workers, providing the demand for a demand-driven system. (iii) Enhancing the capacity of extension staff to serve as technically skilled and group sensitive facilitators of farmers' experimental learning. Rather than prescribing blanket recommendations that cover a wide geographic area, the methods train the extensionist's to work with farmers in validation and adoption of methods and technologies.

By 2002, when the FFS project ended, some 192 FFS had been established in Soroti districts following a foci model with at least 15 FFSs in each sub-county. About 4,800 farmers have undergone season-long training in integrated production and pest management (IPPM). Of these 90 farmers have undergone a refresher training of trainers to become farmer-facilitators establishing FFSs in their respective sub-counties (IFAD 2002b).

The FFS approach exposed farmers to a learning process in which small groups (4-5 farmers) regularly observe a field as an entire ecosystem and learn to make crop management decisions based on an analysis of the observations. This way farmer's capacity to validate new technologies or multiple ways of responding to field situations gradually improves. The systematic season-long training following the crop growing cycle from land preparation to harvest enables the farmers to adapt technologies to suite their situation and also become more responsive to change. The methodology has thus proved effective in group formation and motivation and in enabling farmers to undertake farming oriented self-learning with a trained moderator (IFAD 2002).

While IPPM is the entry point, farmers' priorities have influenced the programme to add into the curriculum other aspects that have a direct bearing on production. Most important additions are HIV/AIDS, basic principles of nutrition, reproductive and family health care, malaria control, immunisation, basic principles of environmental management, water and soil conservation, and basic financial management skills. The multi-dimensional approach has led to strong informal linkages across government departments, Non Governmental Organisations (NGOs), Community Based Organisations (CBOs) research and other service providers. This has even been easier because of the grant system used in the programme. At the establishment of the FFS, farmers, under the guidance of a facilitator, write a simple grant proposal stipulating their background, common goal, what they intend to do, their contribution, sustainability of the group, work plans and budget for the season-long training. Then funds are transferred directly to their bank account, including the facilitators' allowances.

Qualitative interviews with FFS members and leaders indicate that participation in a season-long learning cycle based has greatly improved FFS members' analytical skills and enabled them to articulate demands more accurately and effectively. A second effect mentioned by during all interview is the creation of trust among FFS group members. Even through external support for the FFS groups ended in 2002, many of the groups have continued using their own savings to finance activities.

A clear indicator of the strong farmer empowerment aspects of the FFS approach to learning and organisation is its positive effect on the establishment of NAADS groups and Farmer Fora. There is a clear difference in the pace in the which farmer fora were established in the different sub-counties and how well they function. In sub-counties where a critical mass of FFS groups existed, these seized the opportunity and converted into NAADS groups. Interviews with SCFF members indicate that individual FFS graduates who are no longer members of a FFS group have often been the driving force in establishing new NAADS groups.

Moreover in the Sub Counties where FFS are present, a high proportion of NAADS group leaders, Parish Farmer Fora members and Sub County Farmer Fora members are FFS graduates. As an example on the practical influence of FFS on the functioning of NAADS groups and farmer fora, the chairman of Kyera Sub-County Farmer Fora stated that FFS turned NAADS groups had been instrumental in assuring a rate of co-financing, as many of these groups have bank accounts from which they have paid their NAADS fee.

3. Impact assessment methodology

Impact assessments of agricultural research carried by CGIAR have in the past primarily focused on release of modern varieties and their associated economic returns from increased production (Pingali, P.L. 2001, Watson, D.J. 2003, CGIAR 2004). Accountability is the predominant aim of these impact assessments and their focus is primarily on the interventions, rather than the communities subjected to the interventions.

The new Science Council (of 2004) has broadened the scope of impact assessments, including assessments of ‘soft’ impact, such as training and capacity building (CGIAR 2004, Egelyng 2005). Use of participatory approaches in impact assessments has furthermore become more mainstream. Participatory impact assessments take the target groups’ perspective into account when testing the effects of an intervention.

Some researchers, however, have questioned whether using participatory approaches for impact assessment is the best way to disclose information about the target group subjected to a given intervention (Folke 2000, Peter Kragerup forthcoming). While participatory approaches in some situations are an effective way of extracting information “...it has not in practice provided particularly good instruments for the kind of analysis of social relationships which projects require.” (Mosse 1998: 15) Further participatory methods are “often more likely to obscure than reveal the local social relations which shape them” (Mosse 1998: 16). (Quoted in Peter Kragerup forthcoming).

Yet another approach to impact assessment, which has seldom been associated with CGIAR, seeks to understand the dynamics and interactions between the intervention and the intervened (rather than the effects or impact of an intervention on the intervened). This approach is inspired by social science development research and takes its point of departure in the dynamics of development and cover a wide specter of studies. While

most impact assessment studies see interventions as a one-way process, studies within this approach perceive impact as an interaction (Kragerup forthcoming). Another characteristic of this development research approach to impact assessment is it is fieldwork-based and rich in data.

This study is inspired by the development research approach to impact assessment and aims to (i) place the agricultural technology development among poor farmers in Soroti district, Uganda in a socio-economic and institutional context and (ii) differentiate between different well-being categories, when assessing of impact of access to improved technologies, farmer empowerment and access to privatized demand-driven advisory services.

A team of researchers from Danish Institute for International Studies (DIIS) and Agricultural Economics and Agribusiness, Makerere University carried out fieldwork in 2001 and twice in 2004. The fieldwork comprised a range of complementary qualitative anthropological fieldwork techniques with formal quantitative household questionnaire survey techniques. The 2001 survey included interviews with local government officials, with key informants among farmers, and with farmer groups using qualitative SWOT and PRA ranking techniques. The qualitative data was followed up with a formal questionnaire carried out among 106 randomly selected households. During the 2004 fieldwork well-being indicators were identified based on farmers' own perception of well-being. Using a district-based well-being ranking methodology (CIAT 1999) a poverty index was constructed based on 13 well-being indicators. A household questionnaire further was developed reflecting the well being indicators. The questionnaire was administered among 408 households using stratified random sampling including 300 households that were members of Farmer Field Schools and/or NAADS groups and 111 households who were not members of any farmer group. Statistical analysis of quantitative data was followed up by qualitative in-depth life-history interviews with farmer group members and leaders.

4. Characteristics of rural poverty in Soroti district

Well being ranking methodology

Well being indicators. Multidimensional and participatory poverty well-being indicators were identified by farmers through a well-being ranking methodology developed and tested elsewhere in Uganda (Ravnborg 1999, ASPS 2002, ASPS 2003, Boesen, et al. 2004). Small groups of informants' were asked to rank all households in their community into three groups using a card-sorting method and thereafter asked describe the well-being of each group. The resulting sets of well-being indicators were thereafter extrapolated and tested statistically for representativeness and translated into the 13 expression of farmers' perception of well-being indicators².

² The result from the extrapolation analysis ensure that no major pattern of correlation exist between use and non-use of specific sets of indicators, making the result valid for all types of communities and informants. Sets of indicators that were specific for local agro-ecological conditions (i.e. use of animal drought power) were left out of the final set of household poverty indicators. See ASPS 2002 and Ravnborg, H.M. 1999 for a detailed discussion of the methodology.

Poverty index. Based on the household poverty indicators, a household's poverty index is computed as the mean of its scores for each of the 13 well-being indicators. The variable of each well-being indicators is assigned the values 33, 66 and 100. Statistical analysis of the internal and external logic of the household poverty index was undertaken to confirm the validity of the poverty index.

The 25 and 70 percentiles, combined with examination of to combined indicator score provided guidance to defining the index values of three well-being categories: non-poor, poor and very poor³.

Table 1. Scoring system for indicators constituting the household poverty index

Indicator	Score	Description
ILAND	33	Own (including leasehold, customary tenure and freehold) more than five acres of land
	67	Own (including leasehold, customary tenure and freehold) between one and five acres of land
	100	Do not own land or own less than one acre
INONAG	33	Somebody have "high entry cost" non-agricultural sources of income, like being professionals, having shops or businesses (trading, transport, etc.)
	67	Somebody have non-agricultural sources of income like tailoring, building, crafts-making, brewing beer, making and selling bricks, charcoal etc. or preparing and selling food
	100	Nobody are engaged in non-agricultural sources of income
ILABOUR	33	Nobody from the household work for others as casual laborers
	67	Somebody from the household work for others as casual laborers, but either only three months or less per year or more than three months per year but not more than once a week
	100	Somebody from the household work for others as casual laborers more than three months per year or less than three months per year but almost every day
IANIMAL	33	Somebody in the household has cattle or oxen, possibly together with other animals
	67	Nobody in the household has cattle, but they have other animals (goats, sheep, pigs, chicken, turkeys or rabbits)
	100	Nobody in the household have any animals
IHIRE	33	Hire laborers for at least two of the following tasks: land clearing, ploughing, planting, weeding and harvesting
	67	Do not hire laborers or hire laborers for one task only

³ The index value chosen for well-being category are as follows: non-poor have an index value below 61,6, less poor consist of households with index value between 61,6 and 71,99, while the poorest household have an index value of 72 and above. For additional technical discussions of computing a poverty index and selection of index values for well-being categories, see ASPS 2002 (appendix 2.VI).

IFOOD	33	Have not experienced a period of food shortage within the last year
	67	Have experienced a period of food shortage within the last year which lasted less than two months or which lasted longer but the only recourse that was taken were eating less meat, using farm products rather than buying so much or buying food
	100	Have experienced a period of food shortage within the last year which lasted two months or more
IFEED	33	Bought sugar when they last ran out of sugar, eat meat at least once a month and fry food at least once a week
	67	Either did not buy sugar when they last ran out of sugar, or eat meat less than a month or fry food only occasionally (but not all three conditions at once)
	100	Went without sugar last they ran out of sugar or rarely buy sugar, eat meat less than once a month and fry food occasionally
IHOUSING	33	Have houses with brick or plastered walls and iron or tile roofs
	67	Have houses which might have iron roof, plastered walls or walls of bricks or unburned bricks but not both conditions at once
	100	Have houses with walls made of old tins or banana or other leaves and grass-thatched roofs or roofs made of banana or other leaves, old tins or polythene, or have houses that are in need of major repairs
IHEALTH	67	Nobody in the household suffer from T.B., HIV/AIDS, anemia or chest related diseases or are disabled
	100	Somebody in the household suffer from T.B., HIV/AIDS, anemia or chest related diseases or are disabled
ISCHOOL	33	Have or have had children at secondary school or higher or have children between 6 and 12 years in private or other schools at the same time as not having any children between 6 and 12 years who are not in school
	67	Have not (had) children in secondary school, and do only have children between 6 and 12 years in UPE school while not having any children between 6 and 12 years who are not in school
	100	Have children between 6 and 12 years who are not in school
IDRESS	33	Woman owns shoes and both the woman and the children got new clothes about three months ago or more recently
	67	Woman either does not own shoes or last got new clothes half a year or more ago or the children last got new clothes half a year ago or more or the woman does not own shoes and last got new clothes more than a year ago but children last got new clothes three months ago or less
	100	Woman does not own shoes and both the woman and the children last got new clothes more than a year ago
IMARITAL	67	Household head is male or a married woman
	100	Household head is a widow or a single or divorced woman
IAGE	67	Either the household head or the wife is below 55 years of age
	100	Both the household head and the wife are 55 years or above

The well-being categories are heterogeneous, as the categorization of a given household is done based on a calculation of the mean of all scores, rather than using the value of individual poverty indicators as determinants for a well-being category. A non-poor farmer may, for example, not wish to invest in livestock (and will thus score 100 in the IANIMAL wellbeing indicator) and still be characterised as non-poor, if the scores are sufficiently low for the remaining 12 wellbeing indicators. Similarly, a less poor farmer may have a lot of land (i.e. low score on the ILAND well-being indicator) but not be capable to use it effectively; resulting in a high mean score for the indicators combined. This way of defining well-being categories allows for a dynamic analysis of the specific characteristics of poverty within a given enumeration area.

Household questionnaire. On the basis of the well-being indicators, a household questionnaire was drawn up and carried out as a random survey among 411 households in Soroti district that was stratified to include both FFS/NAADS group members and farmers not members of any group.

Characteristics of well-being in Soroti

With regards to assets, analysis of the survey results reveals a significant correlation exists between ownership of land and well-being category. Approximately half of the non-poor farmers own more than 5 acres and the other half between 1 and 5 acres, while only a tenth of the poorest have more than 5 acres and close to a quarter have less than one acre. A similar significant correlation exists between well-being categories and ownership of animals, with three quarters of the non-poor owning cattle, while this is only the case for 40% of the poor and 10% of the poorest. With regard to housing standard, the difference between the three well-being categories is less clear.

There is further a significant correlation between well-being categories and non-agricultural income. Three quarters of the non-poor households receive non-agricultural income, around half of which is from 'high entry cost' sources, while none of the poorest households receive non-agricultural income from 'high entry cost' sources and about half of the poorest have no non-agricultural income at all.

Also for agricultural labour, the analysis shows significant correlations. Less than a third of the non-poor farmers work for other farmers as casual labourers, and those who do only do so to a limited extent. Meanwhile, some 90% of the poorest work as casual labourers and most of them extensively. The opposite picture is the case for hiring casual labour. Some 80% of the non-poor hire casual labour, while this is only the case for some 40% of the poor and only 10% of the poorest.

Significant correlations also exist with regards to household food security and food consumption. 85% of non-poor households are food secure, compared with less than half of the poor and less than a tenth of the poorest. The differences between the well-being categories is less clear with regards to the type of food eaten (the indicator termed 'feeding' by the farmers).

Social well-being categories also show significant differences between farmers from different well-being categories. More than a quarter of the poorest have a member of household who is serious sick, compared with less than a tenth of the non-poor. Almost a quarter of the poor and very poor households have children between 6 and 12 years who do not attend school, while this is so for only one tenth of the non-poor. Half the non-poor household have children attending secondary school or private school, while this is so for about a tenth of the poor and poorest. Also with regards to marital status, there are clear differences, with a third of the poorest households being headed by a widow or a single or divorced woman, while this is so for less than as tenth of the non-poor households.

5. Impact Assessment of farmer empowerment, changes in opportunity structures and access to improved technology

Processes of technology adaptation among members of farmer groups and non members

Analysis reveals a close relationship between participation in farmer groups and effectiveness of agricultural production. A significantly higher percentage of farmers that are members of FFS/NAADS groups than non-members adopt and uses improved techniques for soil erosion control, soil fertility management and pest management, see table 2.

In terms of erosion control, one notes that close to half of the group members use contour ploughing while this is true for only a third of farmers that are not group members. There are significant differences between group members' and non-members' adoption of contour ploughing, planting grass strips and planting cover crops. As for soil fertility management a significantly higher percentage of group members uses improved techniques for organic and mineral fertilizers, while there is no significant difference in use of traditional soil fertility management techniques such as fallowing and mulching. An even clearer picture emerges for pest management, where use of knowledge demanding IPM techniques was significantly higher among group members, while there were no significant differences in use of the simple and easy to use, but expensive, spraying of pesticides.

Technology development through FFS in Soroti district can be characterised as a group approach in which proto-type technologies are adapted on group managed plots through continuously monitoring of the crop and its growing conditions. Through this process farmers innovative capabilities to detect and solve field problems enhances. This form of agricultural development encourage and capacitate farmers to exchange ideas, experiment and adapt technologies to local specific growing conditions, and organise and produce required local biological based inputs, i.e. botanicals (participatory observation).

Table 2. Technology adaptation by members of NAADS and FFS groups in Soroti district

Soil erosion control	Members	Non-members
Contour ploughing***	47.1%	42.6%
Planted grass strips***	43.7%	45.6%
Planted cover crops**	17.6%	15.4%
Mulched ^{ns}	9.2%	0.7%
Made terraces ^{ns}	2.1%	7%
Fanya juu or fanya chini ^{ns}	4.6%	5.1%
Stopped removing plant residues ^{ns}	16.8%	22.1%
Soil fertility management		
Stopped burning **	36.1%	36%
Use of green manure ^{ns}	21%	18.4%
Incorporated other residues***	46.6%	41.9%
Used compost***	23.5%	15.4%
Used chicken, goat or pig manure ^{ns}	37.0%	36.0%
Planted green manure***	26.1%	14%
Used chemical fertilizer**	9.2%	3.7%
Used cattle manure to improve soil***	36.6%	19.1%
Fallowed to improve soil***	36.6%	28.7%
Mulched to improve soil fertility ^{ns}	2.1%	0%
Pest control		
Used improved seed***	47.5%	36.0%
Used the natural enemy to destroy the pest***	29.0%	19.1%
Improved soil fertility***	29.0%	16.2%
Monitored pest population**	59.2%	52.9%
Prepared the seed bed early enough **	47.9%	41.9%
Monitored weed population ^{ns}	45%	45.6%
Sprayed the crops***	38.7%	27.2%
Did nothing to destroy the pests***	2.1%	2.2%

Note: N= 411 households. *** - 0.01 level of significance,
 ** - 0.05 level of significance, ns – not significantly different
 Source: 2004 DIIS/MUK Soroti household survey

Differentiation in well-being between members and non members of farmer groups

Table 3 shows that farmer group membership is correlated with wealth on a 1 % significant level. The proportion of poorest farmers among farmers who are not group members is three times higher than farmers who are group members.

Table 3. Social differentiation of NAADS and FFS groups in Soroti district 2004

Poverty level ***	Membership to a group (mostly FFS)		
	Yes	No	Overall
Better-off	63.0%	40.8%	57.4%
Less poor	30.2%	38.8%	32.4%
Poorest	6.8%	20.4%	10.2%

Note: *** - 0.01 level of significance. N= 411 households. Source: DIIS/MUK Soroti household survey 2004.

Almost two thirds of the farmers who are members of FFS/NAADS groups⁴ are characterized as better off compared with 41% of non-group members. A particularly striking feature from the table is that only 7 % of the FFS/NAADS group members are today among the poorest category of farmers (compared with 20% of non-group member farmers).

This situation can be interpreted as the result of two different processes. Firstly that better-off farmer takes advantage of their privileged social position in the local community to dominate groups that are associated with access to external resources. Secondly, that poor farmers through group membership acquired skills that enable them to escape poverty through improving productivity of household resources. Depending on which of these processes dominate, the correlation can be interpreted as: (i) a reflection of the formation of the group being biased towards better-off farmers, or (ii) the effect of group membership contributing to poverty reduction. The study examines this question through a combination of qualitative interviews (focusing on the group formation process and on life-history of well-off group members) and additional statistical analysis of questionnaire data (correlation and chi-square tests between group-membership and poverty indicators).

Group formation process.

The general lesson learned from group formations processes elsewhere in Uganda and elsewhere in Africa is that when there are immediate tangible benefits to be gained from membership of a group, it is likely to be dominated by non-poor farmers if the group formation process is 'open' and guided by local community leaders (Friis-Hansen 2003, Westerman forthcoming).

Qualitative interviews with FFS members and local leaders revealed that because of successful 'sensitization' prior to the group formation, the recruitment of members to FFS groups in Soroti district were done on the basis of self selection (and exclusion) around a common 'interest in learning new skills'. As a result the groups were made up of a mix of different type of farmers, indicating that the group formation process was not biased towards better-off farmers.

In spite of the sensitization, interviews show that some farmers still joined FFS groups' primary because of an interest in access to external funds. However, these farmers often left the group within a short period, when realizing group activities were focused on experiential learning based on principles of informal adult education, and did not provide its members with direct access to tangible goods. As a consequence, the FFS groups experienced an initial high turn over of members, with up to half of members leaving the group within the first year. The farmers leaving the groups were in part farmers leaving because faulty expectations (of direct material benefits) and in part better-off farmers leaving as participation was viewed as too time consuming compared with benefits. Common characteristics of farmers who have remained members of FFS are a

⁴ The household survey was undertaken as a stratified random sample with a disproportional representation of FFS groups members/graduates. The majority of NAADS groups in this sample therefore comprise of established FFS groups that registered as NAADS groups.

willingness to invest time and effort in learning and in carrying out joint activities. The majority of FFS members are women and the FFS groups have shown to be inclusive of illiterate and other socially disadvantaged persons.

Using lifecycle interview to assess change in well-being

In-depth lifecycle interviews with FFS/NAADS group members indicate that the majority of the farmers who can be characterized as better-off today were among the poorest and less poor categories of farmers when they joined FFS in 1999-2001. See example of lifecycle interview in box below.

Box: Summary of lifecycle interview of Mrs. Grace Asio, Chairperson for Asureli women's FFS

Grace joined a new women only FFS in year 2000. Neither Grace nor any of the other 29 women in the group were well off when they joined the group. During the first year of FFS the group went through a classic FFS curriculum studying the growth of cotton plants, and associated pest and diseases and IPM solutions, including identification of insects and timing of spraying. During the second year the group shifted to groundnuts and adapted their new knowledge of insects and natural pesticides to this crop. The group learned to use changes in appearance of the groundnut leaves as an indicator of plant health. During the third year they experimented spraying with pesticides made from the Neem tree compared with chemical pesticides (no major difference in effect). During year four (the current season), the group has discussed market outlets for cash crops including groundnuts, sunflower and sweet potatoes. The FFS group has continued to cultivate a common field, but also applied what they learned to their individual fields. During weekly group meetings the members inspect their common crop as well as selected individual fields. The group has a bank account and part of the proceeds from sale of crops from their common field is accumulated in this account.

Changes in Grace's life since joining the FFS/NAADS: (i) Gained more confidence and is now able to effectively articulate demands to service providers; (ii) Learned better crop management and applied it to her fields; (iii) Changed her mind set and now understands the importance of agriculture being profitable; (iv) Has become better at generating new ideas; (v) Learned the value of organization (i.e. that the group is strong when working together).

Changes in Grace's household since joining the FFS/NAADS: (i) Higher yields have led to increased household crop production. Before FFS Grace often experienced periods of food shortage. Her household is now food secure; (ii) Able to take her children into secondary school; (iii) Before income was a gamble, now, income from agriculture is more secure and more income from comes non-agricultural activities (e.g. FFS facilitation and training activities); (iv) Before she worked as a casual labor on other farmers' fields. Today she occasionally hires other farmers to work for her; (v) she has bought two cows from increased household income. She still has no oxen but is looking for one to buy. She now hires oxen for ploughing using cash, instead of working for the owner of the oxen.

Women, many of whom are illiterate, make up the majority of the FFS/NAADS group members. The lifecycle interviews gave strong indications of poverty reduction among female members of FFS/NAADS groups (which was later confirmed during interviews with FFS facilitators).

Basis of qualitative life-cycle interviews among FFS/NAADS group members the following hypothesis was formulated:

Effective farmer learning in FFS combined with improved technology access through NAADS has created a pathway out of poverty based on improved of agricultural productivity among poor farmers. Changes have occurred within the three agricultural related poverty indicators ILABOUR, IFOOD, IHIRE. Income from surplus production has been invested in at least one cow, affecting the poverty indicator IANIMAL.

The first three of these four well-being indicators differ from the remaining 10 indicators, in the sense that they do not require capital on long periods of time to change. Social mobility within the first three categories therefore seems plausible, compared with categories such as land ownership or housing standard, which are less likely to change within a four-five year period. In the following quantitative statistics of household data is used to verify and test this hypothesis.

Significant correlation between ‘being member of a group’ and ‘being better off’

To test the hypothesis we are interested in understanding if there is a correlation between being member of a group and poverty level within any of the 13 poverty indexes. Firstly, we analyze if there is a significant amount of people being better off and being member of a group simultaneously. The result is shown in table 4, where households (divided according to whether they are member of a FFS/NAADS group) are correlated with the 13 poverty indexes (each with three parameters (33 being better off, 67 less poor, 100 poorest).

The table shows that 307 (73,5%) households belong to a group, and 102 (24,6%) did not. In the first poverty index (ILAND⁵) we can see that 109 (28,4%) households were better off *and* belonged to a group, and within same index 38,8% of people belonging to a group were better off.

Our hypothesis relates to the highlighted poverty index: ILABOUR, IANIMAL, IHIRE and IFOOD. These four poverty indicators, the number of group members scoring 33 is lower than the remaining nine poverty indicators. This indicates that there is a strong relationship between being better-off and being part of a group within these four poverty indexes.

⁵ Meaning that the household owns more than five acres of land.

Table 4. Membership of farmer groups by well being indicators

Well being indicators	Membership of FFS/NAADS group						
	Yes			No			
	Count	Table N %	Column N %	Count	Table N %	Column N %	
Total	307	73,5%		102	24,6%		
Iland	33	119	29.1%	38.8%	38	9.3%	37.3%
	67	172	42.1%	56.0%	57	13.9%	55.9%
	100	16	3.9%	5.2%	7	1.7%	6.9%
INon-agricultural income	33	76	19.4%	26.0%	19	4.9%	19.2%
	67	125	32.0%	42.8%	56	14.3%	56.6%
	100	91	23.3%	31.2%	24	6.1%	24.2%
Ilabour	33	167	41.0%	54.8%	38	9.3%	37.3%
	67	98	24.1%	32.1%	33	8.1%	32.4%
	100	40	9.8%	13.1%	31	7.6%	30.4%
Ianimal	33	191	46.9%	62.4%	50	12.3%	49.5%
	67	102	25.1%	33.3%	37	9.1%	36.6%
	100	13	3.2%	4.2%	14	3.4%	13.9%
IHire	33	203	50.1%	67.0%	39	9.6%	38.2%
	67	100	24.7%	33.0%	63	15.6%	61.8%
IFood	33	206	52.7%	70.3%	48	12.3%	49.0%
	67	45	11.5%	15.4%	24	6.1%	24.5%
	100	42	10.7%	14.3%	26	6.6%	26.5%
IFeeding	33	38	9.9%	13.2%	5	1.3%	5.2%
	67	223	58.1%	77.7%	81	21.1%	83.5%
	100	26	6.8%	9.1%	11	2.9%	11.3%
IHousing	33	10	2.6%	3.4%	5	1.3%	5.4%
	67	274	70.8%	93.2%	83	21.4%	89.2%
	100	10	2.6%	3.4%	5	1.3%	5.4%
IHealth	67	263	64.8%	86.8%	86	21.2%	83.5%
	100	40	9.9%	13.2%	17	4.2%	16.5%
ISchool	33	90	30.5%	38.5%	16	5.4%	26.2%
	67	108	36.6%	46.2%	36	12.2%	59.0%
	100	36	12.2%	15.4%	9	3.1%	14.8%
IDress	33	118	29.6%	39.2%	30	7.5%	30.9%
	67	176	44.2%	58.5%	63	15.8%	64.9%
	100	7	1.8%	2.3%	4	1.0%	4.1%
IMarital	33	269	65.5%	87.3%	86	20.9%	83.5%
	67	39	9.5%	12.7%	17	4.1%	16.5%
IAge	33	274	68.5%	91.3%	93	23.3%	93.0%
	67	26	6.5%	8.7%	7	1.8%	7.0%

In order to verify whether the numbers correlate, or that the high amount of people being better off within the four poverty indexes is just a reflection of statistically uncertainty, we carry out a Chi-square test (see table 5). The highlighted areas show, that the significance value, for each of the four mentioned poverty indexes, is *lower* than 0.05. This indicates

that there is a significant correlation between these four poverty indexes and relation to a group. And since we observed in the first table, that a considerable larger amount of households being better off within these poverty indexes also belonged to a group (compared to the other poverty indexes), it is valid to conclude that either being part of a group has a positive effect on poverty level or vice versa – either way, the relation is significant⁶.

Table 5. Pearson Chi-Square Tests

Has any one ever been a member of any group												
iland	inonag	ilabour	ianimal	ihire	ifood	ifeed	ihousing	ihealth	ischool	idress	imarital	iage
Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square	Chi-square
.417	5.649	17.728	12.959	26.249	14.893	4.933	1.541	695	3.667	2.721	.968	.275
Df 2	Df 2	Df 2	Df 2	Df 1	Df 2	Df 2	Df 2	Df 1	Df 2	Df 2	Df 1	Df 1
Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
.812	.059	.000(*)	.002(*)	.000(*)	.001(*)	.085	.463(a)	.404	.160	.256	.325	.600

* The Chi-square statistic is significant at the 0.05 level.

a More than 20% of cells in this subtable have expected cell counts less than 5. Chi-square results may be invalid.

Conclusion

The central argument in this study is that a *combination* of farmer empowerment through experiential learning in FFS groups and changes in the opportunity structure through transformation of LGA staff, establishment of sub-county farmer fora, and emergence of private service provider, has been successful in reducing rural poverty. Agricultural growth among poor farmers in Soroti district has been the key reason for poverty alleviation.

The study has shown that farmers who currently members of FFS/NAADS groups are significantly better off than non-member farmers. The area-specific well-being ranking methodology used in this study that is based on farmers' perception has proved to be a very useful impact assessment technique. Qualitative interviews further indicate that most farmers were among the poorest or less poor when they joined FFS. This is a major achievement and evidence in support of the hypothesis that farmer empowerment through demand driven advisory services can contribute significantly to alleviating rural poverty. The analysis further showed that pathway out of poverty included labour, food security and investment in cattle.

The explanation for the higher rate of adoption of technology within FFS/NAADS groups is the *combination* for broad-based farmer learning in FFS combined with subsequent access to advice on commercial enterprises. A lesson learned is that market-based spread of pro-poor technologies requires an institutional setting that combines farmer empowerment with an enabling policy environment.

⁶ A significance value lower than 0.05, means that there is minimum a 95% chance of being statistically correct when drawing this conclusion.

References

- Appleton, Simon 2001. Changes in Poverty and Inequality, pp. 83-122. In Ritva Reinikka and Paul Collier, eds., *Uganda's Recovery: The Role of Farms, Firms, and Government*. Washington, DC: World Bank.
- ASPS 2002. External Monitoring Unit: Department of Agricultural Economics, Makerere University, Kampala (DAE-MUK) and Centre for Development Research, Copenhagen (CDR). 2002. Gendered district poverty profiles and monitoring of ASPS outcomes, Kabarole, Masaka, Pallisa, Rakai and Tororo districts, Uganda. Copenhagen and Kampala.
- ASPS 2003. Gender and Poverty Impact Monitoring for the Agricultural Sector Programme Support (ASPS); Uganda: ASPS Component Impact Processes. Department of Agricultural Economics, Makerere University (DAE-MUK) and Centre for Development Research (CDR). Copenhagen and Kampala.
- Bhorat, Haroon 2005. Poverty, inequality and labour markets in Africa: A descriptive overview. Development Policy Research Unit - Working Paper 05/92. University of Cape Town
- Bird, Kate and Isaac Shinkeya 2003. Multiple Shocks and Downward Mobility: Learning from the Life Histories of Rural Ugandans. CPRC Working Paper 36. Manchester, UK: Chronic Poverty Research Centre.
- Boesen, J. and R. Miiro, with S. Kasozi, 2004: Basis for poverty reduction? A rich civil society, farmer innovation and agricultural service provision in Kabale, Uganda. DCISM Working Paper. Copenhagen 2004.
- Brock, Karen, Rosemary McGee, and Richard Ssewakiryanga 2002. Poverty Knowledge and Policy Processes: A Case Study of Ugandan National Poverty Reduction Policy. Research Report 53. Brighton, UK: Institute of Development Studies.
- Bryceson, D.F 2004. Agrarian Vista of Vortex: African Rural Livelihood Policies. Review of African Political Economy No.102:617-629.
- Bukenya C. 2003. Exploring the key issues in the National Agricultural Advisory Services Programme implementation process in Uganda: Experiences from the first two years in three trailblazing districts.
- CGIAR 2004. Impact. Everybody's business. Annual report 2003. CGIAR.
- Collier, Paul and Ritva Reinikka 2001. Introduction, pp. 1-12. In Ritva Reinikka and Paul Collier, eds., *Uganda's Recovery: The Role of Farms, Firms, and Government*. Washington, DC: World Bank.
- Commission for Africa 2005. Our Common Interest. Report of the Commission for Africa. London.
- Deininger, Klaus and John Okidi 2003. Growth and Poverty Reduction in Uganda, 1992-2000: Panel Data Evidence. Development Policy Review, 21 (4), 481-509.
- Dijkstra, A. G., & van Donge, J. K. 2001. What does the "show case" show? Evidence of and lessons from adjustment in Uganda. World Development, 29(5), 841-863.
- Dorward et.al. 2004. A policy for pro-poor agricultural growth. World Development. Vol.32, No.1, pp.73-89.

- Douthwaite, B. 2002.: “Enabling Innovation. A practical guide to understanding and fostering technological changes”. Zed Books Ltd. London.
- Egelyng 2005. Development returns from investing in international agricultural research. Vol I and II. Draft version prepared for a seminar on agricultural research held in Copenhagen 4th March 2005.
- Ellis, Frank 2003. Livelihoods and Rural Poverty Reduction in Uganda. World Development Vol. 31, No. 6, pp. 997-1013.
- Folke, Steen 2001. Aid impact : development interventions and societal processes (AID). Copenhagen: Centre for Development Research.
- Francis, Poul, and James, Robert 2003. Balancing Rural Poverty Reduction and Citizen Participation: The Contradictions of Uganda’s Decentralization Program. World Development Vol. 31, No. 2, pp. 325-337.
- Friis-Hansen and Kizauzi 2004. Evolution of extension-farmer relationship in Uganda. Proceedings from workshop entitled “Extension and Rural Development: A Convergence of Views on International Approaches?” held November 12-15, 2002 in Washington. Washington D.C.: World Bank.
- Friis-Hansen, E. 2003. Knowledge Management. Regional Thematic Review: Agricultural Technology Development and Transfer in Eastern and Southern Africa. Report No. 1347. Rome: IFAD
- Friis-Hansen, E., Aben, C., Ameu, M. and Okoth, J.R. 2003. Evolution of Extension Approaches in Soroti District, Uganda. Proceedings from workshop entitled “Extension and Rural Development: A Convergence of Views on International Approaches?” held November 12-15, 2002 in Washington. Washington D.C.: World Bank.
- Friis-Hansen, Esbern 2004a. Working Paper Farmer Empowerment Programme Component. Agricultural Services Support Programme Tanzania. Agricultural Sector Development Programme (ASDP). Dar es Salaam: ASDP Secretariat.
- Friis-Hansen, Esbern 2004b. DIIS Working Paper. Key Concepts and Experiences with Demand Driven Agricultural Extension in Tanzania. A Review of Recent Literature. Copenhagen; Danish Institute for International Studies.
- Friis-Hansen, E., Manganga, F., and Sokoni, C. 2004. Comparative study of participatory approaches to contextual farmer learning. Proceedings from workshop entitled “Extension and Rural Development: A Convergence of Views on International Approaches?” held November 12-15, 2002 in Washington. Washington D.C.: World Bank.
- GoU 2001. Poverty Status Report. Ministry of Finance, Planning and Economic Development. Kampala: Government of Uganda.
- GoU 2002a. Second Participatory Poverty Assessment Report: Deepening the Understanding of Poverty. Ministry of Finance, Planning and Economic Development. Kampala: Government of Uganda.
- GoU 2002b. Infant Mortality in Uganda, 1995-2000: Why the Non-Improvement? Ministry of Finance, Planning and Economic Development. Kampala: Government of Uganda.

- GoU 2002b. Infant Mortality in Uganda, 1995-2000: Why the Non-Improvement? Ministry of Finance, Planning and Economic Development. Kampala: Government of Uganda.
- Government of Uganda 2000. National Agricultural Advisory Services Programme. Master document of the NAADS task force and joint donor group. Entebbe: MAF
- Hagmann, J., E. Chuma, K.M Connolly, P. Ficarelli (2002). Success Factors in Integrated Natural Resource Management R & D – Lessons from Practice. In Conservation Ecology 5(2): 29 Online <http://www.consecol.org/vol5/iss2/art29>
- Hickey, Sam 2003. The Politics of Staying Poor in Uganda. CPRC Working Paper 37. Manchester, UK: Chronic Poverty Research Centre.
- Hutchinson, Paul 2001. Combating Illness, pp. 407-49. In Ritva Reinikka and Paul Collier, eds., Uganda's Recovery: The Role of Farms, Firms, and Government. Washington, DC: World Bank.
- IFAD 2002a, "Regional Strategy Paper" – Eastern and Southern Africa. Rome: IFAD.
- IFAD 2002b. East African Regional Pilot Project for Farmers' Field Schools. IFAD Technical Assistance Grant No. 427 Evaluation Report. Rome: IFAD.
- Johnson, Deb 2002. Insights on Poverty. *Development in Practice*, 12 (2), 127-37.
- Kappel, R., Lay, J. and Steiner, S 2005. Uganda: No more Pro-poor Growth?. *Development Policy Review*, 2005, 23 (1): 27-53.
- Lawson, Andy 2003. Uganda: The Influence of Health on Chronic and Transitory Poverty. Paper presented at Chronic Poverty Research Conference, Manchester, UK, April 7-9, 2003. Available at www.chronicpoverty.org
- Lawson, David, Andy McKay, and John Okidi. (2003). Poverty Persistence and Transitions in Uganda: A Combined Qualitative and Quantitative Analysis. CPRC Working Paper 38. Manchester, UK: Chronic Poverty Research Centre.
- Lwanga-Ntale, Charles 2003. Chronic Poverty and Disability in Uganda. CPRC Working Paper. Manchester, UK: Chronic Poverty Research Centre.
- Lwanga-Ntale, Charles and Kimberley McClean 2003. The Face of Chronic Poverty in Uganda as seen by the Poor Themselves. CPRC Working Paper. Manchester, UK: Chronic Poverty Research Centre.
- McKay, Andrew, and Lawson, David 2003. Assessing the Extent and Nature of Chronic Poverty in Low Income Countries: Issues and Evidence. *World Development*. Volume 31, Issue 3, March 2003, Pages 425-439
- Mijumbi, Peter and John Okidi 2001. Analysis of Poor and Vulnerable Groups in Uganda. Occasional Paper No. 16. Kampala: Economic Policy Research Centre.
- Mosley, Paul. 2002. The African green revolution as a pro-poor policy instrument. *Journal of International Development* No. 14: 695-724.
- Mosse 1998. *Development as a process : concepts and methods for working with complexity*. London : Routledge, 1998.
- NAADS 2002. Programme Review of NAADS on Poverty-Targeting. JRB Consulting Associates Ltd for MAAIF.
- NAADS 2003. Second Joint Government of Uganda – Donor Review (April – May 2003). Consultants E. Adipala, C. Laker, C. Tizikara, and H. Wadhawan. Kampala 2003.

- Neuchatel Group 1999. Common Framework on Agricultural Extension. Paris: CF.
- Okidi, John A. and Andrew McKay 2003. Poverty Dynamics in Uganda: 1992 to 2000. CPRC Working Paper 27. Manchester, UK: Chronic Poverty Research Centre.
- Okidi, John A. and Gloria K. Mugambe 2002. An Overview of Chronic Poverty and Development Policy in Uganda. CPRC Working Paper 11. Manchester, UK: Chronic Poverty Research Centre.
- Okwi, P. 1999. Poverty in Uganda: A Multivariate Analysis. EPRC Research Series No. 22. Kampala: Economic Policy Research Centre.
- Peter Kragerup. Unpublished PhD thesis.
- Pingali, P.L. 2001. Milestones in impact assessment research in the CGIAR 1970-1999.
- Ravallion, M. 2001. Growth, Inequality, and Poverty: Looking Beyond Averages. *World Development* 29 (11): 1803-15.
- Ravnborg, H.M. 1999. Developing regional poverty profiles based on local perceptions. CIAT, Cali, Colombia.
- Ravnborg, Helle M., Jannik Boesen, and Anne Sorensen. 2004. Gendered District Poverty Profiles and Poverty Monitoring: Kabarole, Masaka, Pallisa, Rakai and Tororo Districts, Uganda. DIIS Working Paper 2004: 1. Copenhagen: Danish Institute for International Studies.
- Reardon and Vosti 1995. Links between rural poverty and the environment in developing countries: asset categories and investment poverty. *World Development* 23 (9): 1495-1506.
- Röling, N.G. and Wagemakers, A.E. 1998. A new practice: Facilitating sustainable agriculture. In Röling, N.G. and Wagemakers, A.E. (Eds) 1998. *Facilitating sustainable agriculture. Participatory learning and adaptive management in times of environmental uncertainty*. Cambridge: Cambridge U.P.
- Shepherd, Andrew 2001. Consolidating the lesions of 50 years of 'development'. *Journal of International Development*(13): 315-320.
- Ssewanyana, Sarah, John A. Okidi, Diego Angemi, and Vernetta Barungi. 2004. Understanding the Determinants of Income Inequality in Uganda. Kampala: Economic Policy Research Institute.
- Uganda 2000. Plan for modernization of agriculture (PMA): eradicating poverty in Uganda. Kampala: Ministry of Agriculture, Animal Industry and Fisheries & Ministry of Finance and Planning and Economic Development.
- WB 2003. Proceedings from workshop entitled "Extension and Rural Development: A Convergence of Views on International Approaches?" held November 12-15, 2002 in Washington. Washington D.C.: World Bank.
- Woodhouse, Philip 2003. Local Identities of Poverty: Poverty Narratives in Decentralised Government and the Role of Poverty Research in Uganda. Working paper. Manchester, UK: IDPM, University of Manchester.
- World Bank 2003. Agricultural Investment Note: Decentralizing Agricultural Extension and Information Services.