Uganda Journal of Agricultural Sciences, 2004, 9, 250-256 ISSN 1026-0919

Smallholder agricultural technology development in Soroti district: Synergy between NAADS and farmer field schools

E. Friis-Hansen, C. Aben,[1],and M. Kidoid[2]

Danish Institute for International Studies Strandgade 56, DK-1410 K, Copenhagen, Denmark;
[1]Distict Agricultural Office P.O. Box Soroti District, Uganda
[2]Department of Agricultural Economics and Agrobusiness, Makerere University

Abstract

Greater involvement of farmers in development and dissemination of agricultural technology is a key component in current reforms of agricultural services in Uganda. Successful demand-driven agricultural services, however, require that farmers are able to identify and effectively articulate their needs. Experience shows that the capabilities required to analyse causes and effects of their problems and to be active in adapting technologies to their local-specific condition of production is not widely available among all farmers. Experiential farmer learning approach used by Farmer Field School (FFS) has enabled its members to engage in demand-driven agricultural services in Soroti district and thereby contributed to the success of National Agricultural Advisory and Development Services (NAADS) in Soroti district. The study shows that members of FFS and NAADS groups have significantly higher levels of technology adoption and use than non-members. However, the study also reveals that FFS and NAADS groups are not inclusive of poor farmers and that adoption and use of technologies are significantly higher among better-off farmers. The paper is based on fieldwork carried out in 2001 and 2004 that includes a comprehensive qualitative well-being ranking exercise and a large household questionnaire.

Keywords: Demand-driven advisory services, farmer field school, poverty assessment.

Introduction

A total of four fifth of Uganda's population live in rural areas, including the majority of poor people. 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 population is 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 most areas of Uganda to take advantage of improved agricultural technology. Agricultural technology development among smallholder farmers is very uneven in Uganda and the effectiveness and relevance of agricultural services are key explanatory factors (Friis-Hansen 2003).

The NAADS programme and the current reform of National Agricultural Research Organisation (NARO) places Uganda in the forefront of agricultural services reform in Africa (Neuchantel Group 1999, GOU 2000, World Bank 2003a, World Bank 2003b, Friis-Hansen 2004b). These reforms place high expectations to farmers' capability of understanding causes and effects of their agricultural problems, and to organise in a way that allow them to articulate these problems in the form of demands for agricultural services and to effectively manage public and private agricultural service providers (Bukenya 2003, DIIS 2004, Friis-Hansen 2004a).

This paper focus on three sets of issues that are seen to influence the effectiveness of demand-driven advisory services: (i) Use of improved agricultural technology by *members of NAADS and FFS groups*. Recent reports have indicated that demand-driven agricultural development is successful in Soroti district (NAADS 2002, NAADS 2003). However, these statements have largely been based on anecdotal evidence rather than systematic fieldwork. This study has sought to document the extent to which the success of demand-driven agricultural technology development in Soroti district is linked to membership of NAADS or FFS farmer groups. (ii) *Synergy between FFS and NAADS*. The study seeks to understand the relative success of demand-driven advisory in Soroti district by reviewing the recent history of agricultural extension and farmer empowerment prior to the introduction of NAADS (Friis-Hansen *et al*., 2003). (iii) *Poverty targeting*. FFS is

widely sought to be inclusive of poor farmers, however without providing hard evidence to substantiate this claim. This study examines the extent to which poor farmers are members of FFS and NAADS groups.

Methodology

The study is based on two sets of field work in 2001 and 2004. The 2001 survey combined qualitative SWOT and Ranking techniques with a formal questionnaire carried out among 106 randomly selected households. The 2004 survey comprised a four step process. Multidimensional and participatory poverty and gender 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)). The ranking was thereafter extrapolated and tested statistically for representativeness and expressed in the form of a quantitative poverty index. This poverty index is made up of 13 criteria, which together comprise an expression of poverty. On the basis of the 13 identified criteria, a questionnaire was developed and administered among 411 households using a stratified random sampling (biased towards farmer group members). The result from the household questionnaire was analysed using SPSS statistical software. Field work was carried out as collaboration between Department of Agricultural Economics and Agrobusiness, Makerere University, NAADS in Soroti district and Department of Development Research, Danish Institute for International Studies. Only a small part of the data material is presented in this paper.

Introduction to Soroti district

Soroti was among the first districts to be included in NAADS. The 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 technologies and markets are still the key elements in reducing rural poverty.

Use of improved technology by members of NAADS and FFS groups in Soroti district

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 Forum consisting of 15 members has a procurement sub committee of 7 members. The district farmer's forum 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, the programme is coordinated by district and sub-county NAADS coordinators 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 for NAADS to eradicate rural poverty in Uganda. The key components of NAADS 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.

The 2003 annual district review of NAADS Soroti district indicates that farmer groups are increasingly using improved technologies (NAADS, 2003). The 2004 household survey reaches a similar conclusion. Table 1 shows that a significantly higher percentage of farmers who are members of NAADS/FFS groups than non-members adopt and use improved techniques for soil erosion control, soil fertility management and pest management. 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 use 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 were significantly higher among group members, while there are no significant differences in use of the simple and easy to use, but expensive spraying of pesticides. Based on experience with an integrated rural development project in Zimbabwe involved with implementing learning through experience in the extension system, Hagmann *et al.*, 1999 and 2002 concludes that, knowledge and understanding gained through the experimentation process strengthens farmers' confidence in their capacity and knowledge.

This increases their ability to choose the best options and to develop and adapt solutions appropriate to their specific ecological, economic and socio-economic circumstances.

Synergy between NAADS and farmer field school

NAADS was introduced in Soroti in 2001 as a national programme after wide consultations with stakeholders. The speedy implementation of key aspects of the NAADS programme that has occurred since its introduction in Soroti district in 2001 is largely owed to favourable local government and farmer institution environments created prior to NAADS. Soroti district, like all districts in Uganda, was decentralized in accordance with the Local Government Act 1997.

Decentralization has been an effort to improve on service delivery. Political and financial powers have been devolved to district and sub-county levels bringing services nearer to the poor. The central government roles were reduced to policy formulation, coordination, standardization and regulation of services. However, unlike most other districts, Soroti extension department saw decentralization as a chance to gain independence from the top down central government delivery systems, which had turned dictatorial, instructive, and coercive. 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.

Already in 1997, the Soroti local government abandoned the training- and visit inspired unified extension system that treated farmers as passive recipients of externally formulated technology packages in form of extension messages and demonstrations. Between 1997 and 2001 extension services in Soroti district was strongly influenced by two approaches that were both radically different from the T&V approach, namely Farmer Led Extension and Farmer Field Schools (FFS). Both approaches are characterised by interactive learning by discovery on validation study plots taking into account site specific contexts. Many lessons from these programmes were integrated into the implementation guidelines of NAADS e.g.: Participatory Planning Processes, farmer representation at low levels of government, farmer empowerment, experimental learning processes etc.

The FFS became a key building block for the NAADS programme as they were the best farmer groups with a number of networks for technology development and marketing. The farmer field schools approach was introduced into the district in 1999 under the East African 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 the approach include:

- Shortening the time it takes to get research from stations to adoption in farmers' fields by involving farmers in experimentation of their own.
- 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 extensionists to work with farmers in validation and adoption of methods and technologies.
- Increasing 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.
- Establishing coherent farmer groups that facilitate the work of extension and research workers, providing the demand for a demand-driven system.

The approach complements the conventional extension and research activities by exposing 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' 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). By 2002, some 192 FFSs have 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).

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

Table 1. Technology adoption and use by membership 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 fnay 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

the group, work plans and budget for the season-long training. Then funds are transferred directly to their bank account, including the facilitators' allowances.

During the 2001 survey, farmers were asked to rate the different extension approaches which they had experienced prior to NAADS. Training and Visit, Farmer Led Extension and Farmer Field School approaches were rated on a scale of 1-5 on effectiveness of Technology Delivery, Inputs supply, Effectiveness of Design and Farmer Coverage. Table 2 shows that T&V scored highest in supplying inputs to farmers and technology delivery, while the Farmer Led Extension and FFS were still superior in technical delivery, design and farmer coverage due to the group based approach. A SWAT analysis carried our during the same 2001 survey revealed that farmers viewed the key strength of FFS to be that it enhanced their bargaining power (53%), exposed them to managing their own affairs (80%), managing grants (87%), and enhanced their access to improved farming practices (80%). This assessment of FFS is echoed in the 2004 survey that found the advantages of FFS groups over other groups to be strong leadership (27%), greater commitment (26%), access to relevant improved technologies 42%, while only few (4%) found improved access to funding to be the advantage of FFS.

There is much anecdotal evidence of the influence of FFS in terms of preparing farmers to engage in NAADS, a striking example is the fact that virtually all chairmen and leading members of Farmer Forum leaders at sub-county level are FFS graduates. The 2004 household survey asked farmers about the current status of FFS groups for which external support has been fased out. The reply was encouraging. No groups had stopped functioning, around half have continued as FFS groups, some 41% had transformed into NAADS groups, while the remaining groups functioned as saving groups and social groups.

Bias against poor farmers

Although NAADS is characterized by a strongly expressed poverty orientation, some studies indicate, however, that it has so far not had a clear poverty oriented implementation strategy (Friis-Hansen et. al. 2003, Boesen *et. al.*, 2004). The nationwide programme review of NAADS states that that groups were formed hurriedly; with an external impetus; and that mobilization through local government leaders appealed to the progressive, elite and leaders, while "the poorer sections of the population (female headed households, disabled, elderly, among others) were perceived to be excluded (by way of both social exclusion and self-

Table 2. Farmers' rating of approaches to extension and technology development in Soroti District 2001

Criteria	T&V	Farmer Led	Farmer Field School
Technology Delivery	2.7	3.7	3.8
Input Supply	2.9	4.4	3.8
Effective Design	4.4	3.8	2.4
Farmer Coverage	3.5	3.9	2.4
Responsiveness to farmer needs	3.9	3.7	2.7
Staff availability	3.9	3.9	2.4
Farmer involvement	4	3.8	2.4

Note: 1=best, 5=Worst. N= 106 households. Source: 2001 IFAD Knowledge; Management Study.

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

	Membership to a group (mostly FFS)		
Poverty level ***	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: 2004 DIIS/MUK Soroti household survey

exclusion)." (NAADS 2002 Vol. 4, p. 7). The 2004 household survey indicates that the efforts to target and reach the poorest farmers has had limited success in Soroti district. Table 3 shows that most of the members of a FFS or NAADS farmer group were in the better-off well being category. The poverty levels were significantly different among those farmers who were group members and those who were not. The poverty level among non-group members was three times higher than among group members. This implies that better-off farmers dominate FFS groups. The most likely explanation is that the self selection process through which FFS groups are formed favour better-off farmers. A contributing factor could, however, be that some farmers have managed to escape poverty and thus moved out of the poorest well being category.

For many smallholders, the problem is not whether technology exists or can be adapted to suit their overall requirements and circumstances, but how access to its use can be gained. A substantial proportion of existing technology has remained out of reach to poor smallholders. Depending upon farmers' circumstances and production capacity the technology could become financially viable (i.e., accessible) again if farming practices and efficiencies were to be adjusted suitably or organizational measures introduced by farmers and other stakeholders to minimise input costs at local level (Röling and Wagemakers, 1998, IFAD 2002a, Friis-Hansen 2003, World Bank, 2003a).

Gradually the emphasis in determining research content has shifted from reliance on researchers' observations of the farm environment, through structured systems of consultation with farmers and analysis of their socio-economic circumstances leading to researchers' modification of programme content, to systems in which farmers participate actively in research planning, the early testing of technologies and evaluation of their effectiveness before they are recommended for wider adoption (Douthwaite 2002, Friis-Hansen, 2003).

The acknowledgement that smallholders are best placed to make effective decisions about farm management practices in their local specific complex environmental and socio-economic context is a strong argument for knowledge empowerment of smallholders. Poor smallholders often strive to maximize the use of diversity, in terms of microclimates within and between fields as well as intra-species diversity of plant genetic resources. Smallholder's agricultural production is not only influenced by its physical and chemical properties, but by a multitude of social and cultural factors. While conventional agricultural research and extension reduces the complexity of smallholder farming, participatory approaches aim to understand these complexities and take them into account. Acceptance of a contextual learning approach is seen as essential to confront the constraints, which exist among smallholders (Röling and Wagemakers 1998, Friis-Hansen, 2004a).

Table 4 illustrates farmers' adoption and use of improved innovations by poverty level. With regards to soil erosion control, the table shows that use of contour ploughing, plating grass strips and planting cover crops is biased towards the better-off households (at significant levels of 0.05 and 0.01), while mulching, terracing, fanya ju and fanya chini and stopping to remove residues are used similarly across all poverty levels. Significantly more poor people mentioned lack of knowledge as the reason for not adopting

Table 4. Technology adoption and use by poverty level in Soroti district

Soil erosion control	Better-off	Less poor	Poorest
Contour ploughing***	47.1%	42.6%	22.2%
Planted grass strips***	43.7%	45.6%	13.3%
Planted cover crops**	17.6%	15.4%	2.2%
Mulched ns	9.2%	0.7%	0%
Made terraces ns	2.1%	7%	0%
Fanya juu or fanya chini ns	4.6%	5.1%	0%
Stopped removing plant residues ns	16.8%	22.1%	8.9%
Soil fertility management			
Stopped burning **	36.1%	36%	11.1%
Use of green manure ns	21%	18.4%	15.6%
Incorporated other residues***	46.6%	41.9%	20%
Used compost***	23.5%	15.4%	2.2%
Used chicken, goat or pig manure ns	37.0%	36.0%	24.4%
Planted green manure***	26.1%	14%	2.2%
Used chemical fertilizer**	9.2%	3.7%	2.2%
Used cattle manure to improve soil***	36.6%	19.1%	8.9%
Fallowed to improve soil***	36.6%	28.7%	6.7%
Mulched to improve soil fertility ns	2.1%	0%	0%
Pest management			
Used improved seed***	47.5%	36.0%	22.2%
Used the natural enemy to destroy the pest***	29.0%	19.1%	13.3%
Used the natural enemy to destroy the pest***	29.0%	19.1%	13.3%
Improved soil fertility***	29.0%	16.2%	8.9%
Monitored pest population**	59.2%	52.9%	42.2%
Prepared the seed bed early enough **	47.9%	41.9%	26.7%
Monitored weed population ns	45%	45.6%	24.4%
Sprayed the crops***	38.7%	27.2%	17.8%
Did nothing to destroy the pests***	2.1%	2.2%	13.3%

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

improved soil erosion control measures. In terms of improved soil fertility, table 4 shows that the use of innovations (apart from mulching and use of green manure) was significantly higher among the better-off and the less poor households. Again, significantly more of the poorest households mentioned lack of knowledge as the reason why they did not use improved innovations. Table 4 finally shows that the use of methods to control pests (apart from monitoring weed populations) was significantly higher among the better-off and the less poor and low among the poorest households. Better-off and less poor dominated the access to information about pest management from extension workers and the FFS. For the rest of the technologies there was no difference in level of access amongst the poverty levels.

Conclusion

The study shows that FFS and NAADS in Soroti district are effective approaches for stimulating adoption and use of agricultural technologies among farmers. Farmers who are members of FFS and NAADS groups have significantly higher use of improved soil conservation methods, soil fertility innovations and pest management techniques than non-members. The knowledge and organisational empowerment of farmers caused by FFS in Soroti district has enabled farmers to take full advantage of the opportunities offered by NAADS and thereby creating synergy between the two programmes. The interaction between FFS and NAADS in Soroti provides important lessons that can be replicated elsewhere in Uganda.

However, failure to reach the poor illustrates the need for more (i) serious analysis that can bring about a comprehensive understanding of the characteristics of different social groups and (ii) use of such information to design mitigating measures ensuring that NAADS and FFS farmer groups are inclusive of the poor farmers.

References

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.

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.*

Boesen, J. Miiro, R., and Kasozi,S., 2004. *Basis for poverty reduction? A rich civil society, farmer innovation and agricultural service provision in Kabale, Uganda. DCISM Working Paper. Copenhagen 2004.*

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.*

Douthwaite, *B., 2002. "Enabling Innovation. A practical guide to understanding and fostering technological changes". Zed Books Ltd. London.*

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, 2004a. Working Paper Famer impowerment Programme Component. Agricultural Services Support Programme Tanzania. Agricultural Sector Development Programme (ASDP). Dar es Salaam: ASDP Secretariat.

Friis-Hansen, 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., 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.

Government of Uganda 2000. *National Agricultural Advisory Services Programme. Master document of the NAADS task force and joint donor group.* Entebbe: MAF.

Hagmann, J., with Chuma, E., Murwira, K. and Connolly, M., 1999. *Putting process into practice: operationalising participatory extension.* ODI Agriculture Research Extension Network Paper No. 94. London: ODI.

Hagmann, J., Chuma, E., Connolly, K.M., and Ficarelli, P., 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

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.

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.

Ravnborg, H.M. 1999. *Developing regional poverty profiles based on local perceptions.* CIAT, Cali, Colombia.

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 uncertaincy. Cambridge: Cambridge U.P.

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.

World Bank., 2003. Agricultural Investment Note: *Decentralizing Agricultural Extension and Information Services*