Uganda Journal of Agricultural Sciences, 2003, 8 : 415 - 426 ISSN 1026-0919
Printed in Uganda
© 2003 National Agricultural Research Organisation

Communication strategies for improved uptake of agricultural research outputs: the agricultural information context in Teso and Lango Farming Systems

A. Mulhall[1], A. Turrall[2], J.Okwadi[3], J. Emurut[4], J.Ocan[4], R.Omadi[4]

Abstract

Throughout the world the financing and delivery of agricultural services is being reformed in an effort to make services more client-led and demand driven. Uganda is no exception with recent reforms to the agricultural extension service and NARO's outreach programme, to bring agriculture services in-line with the Government of Uganda's Plan for the Modernisation of Agriculture. It is clear from past and current projects that communication plays a vital role in the uptake and spread of agricultural technologies. Effective and planned communication is paramount at all stages in the production, testing, adaptation and delivery of agricultural services, whether a physical technology (such as improved seed or improved ox plough) or, a management practice (e.g. intercropping, IPM). Planned communication is important for continuous lesson learning throughout the project cycle. This paper highlights the steps for planning a communication strategy for improved uptake of agricultural research outputs through continuous lesson learning. It also presents preliminary findings from a study to investigate the communication context for delivery of agricultural services in Northern and Eastern Uganda as the first phase of the communications strategy.

Key words: Communication Strategy, Dissemination of Agricultural Research Outputs, Agricultural Service Delivery, Agricultural Information, AKIS, Technology Uptake

Introduction

Recent work in the field of communications has examined the process of disseminating outputs from natural resources research projects (Norrish, et al., 2001 & 2000; Hainsworth, et al., 2000; Mulhall, 1999; Saywell & Cotton, 1999; Garforth and Usher, 1997; Farrington and Edwards, 1993;). More specifically the research has asked questions about how the dissemination activities were planned and how relevant they were to the intended audiences. In most cases, planning was left until the end of the project, when time and finances are limiting factors. Dissemination activities tend to be one off, with little or no pre-testing and little or no planning for subsequent and sustained multiplication of information materials. Norrish et al. (2000) highlight recent concerns with the dissemination of research outputs and cite an example from the ODA's (now DFID) Research Task Group (RTG, 1994, p.24), which concluded that research results 'can no longer be passive, with research products stored 'on the shelf' for subsequent selection by target institutions. An uptake pathway must be clearly identified and planned from the outset when projects are being designed'. Farringdon and Edwards (1993), cited in Norrish et al (2000), conclude that '..... the question of uptake is, at root, inseparably bound up with questions of how adequately research projects are managed throughout the projects cycle' and that 'project outputs which were technically and commercially sound and tailored to users' needs were almost always taken up. This conclusion is supported by case studies presented at a recent workshop to investigate factors that affect uptake and adoption of research outputs conducted by the DFID Crop Protection Programme (Hainsworth, S.D. and Eden-Green, S.J. eds. 2000). Conclusions of studies reported at the workshop include (cited in Garforth & Norrish, 2000):

- the fundamental requirement that technologies are appropriate to farming and livelihood systems;
- the need for user-participation at all stages in research,
- the importance of reviewing uptake from previous

related projects,

- the need to plan for uptake right from the start of a research project,
- the potential of market mechanisms for facilitating dissemination, uptake and adoption;
- the relevance of the institutional context which facilitates or constrains farmers' access to resources;
- and the idea that a basket of options is more helpful to end-users than a single recommended practice or technology.

This further emphasises the need for a communication strategy that considers the needs of all stakeholders throughout the project cycle, with a clear understanding and definition of target audience needs from information. Dissemination is an activity that continues after the project ends and its success in the long term will depend on partnership links and the communication capacity, reach and effect of partner, target and local organisations (Norrish, et al, 1999).

The nature of technology dissemination

Following on from the technology transfer model, Roling (1988) emphasised the need for better understanding of the wide range of actors (stakeholders) involved throughout the technology generation, adaptation and dissemination process. Roling's AKIS theory seeks to identify different actors involved in natural resource management and investigates the relationships and networking between them. Through understanding the 'communication context' mechanisms and methods for more effective and efficient dissemination of technologies are identified and developed (Ramirez, 1997).

The transfer of technology model, which considers research the starting point for disseminating agricultural knowledge, has been the standard for NARS in many countries (FAO, 1995). The use of participatory approaches and systems thinking, which investigate farming systems from a farmers perspective (e.g. Lightfoot & Minnik 1991) has done much to change the way research and extension are delivered. Such methodologies require close linkages and information exchange between different service providers in the generation, adaptation and delivery of agricultural services. Rather than focusing on the technology itself, new systems (of information exchange) recognise that information and knowledge provide a common denominator among farmers, extension workers, agricultural educators and researchers (FAO, 2000). Farmers are now seen as demanders of services, rather than recipients of research and extension services, where technologies are 'promoted' for adoption.

The focus is now on people centred research rather than technology centred research and takes place in a wider changing policy environment where the following key issues (identified by Garforth & Norrish, 2000) must be addressed in any research and development initiative:

- Poverty - who takes up research outputs?
- Livelihoods - what impact do research outputs have on their lives?
- Gender - is there differential uptake and impact between men and women?

There is now strong evidence to prove that agricultural research outputs will not reach end-users if a one-way process of technology development and dissemination is implemented. As Ramirez (1997) notes, 'experience has shown that top-down transfer of technologies has proven inadequate for resource-poor farmers where rural people face complex environments with site-specific conditions which require site- specific attention. Now it is clear that the process must be multi-directional, participatory with regular reflection (action research), and modification. Client-oriented agricultural research means that there is increased involvement of civil society in provision of services and that there is full participation of clients in the identification, development, evaluation and dissemination of agricultural technologies.

Planning dissemination of agricultural research outputs

A recent paper by Garforth and Norrish (2000) highlights the most recent arguments and evidence for planned dissemination of agricultural research outputs to improve the uptake and adoption of research outputs. They conclude that if uptake (of research outputs) is to be taken seriously then we must

- Analyse the livelihood and economic context of farmers and farm households
- Identify the nature of a research output
- Create an environment for uptake through communication activities that raise the awareness and interest of the target recipients
- Enable participation in all stages of technology development and its evaluation
- Involve ourselves in dialogue with stakeholders so that we learn of early warnings of constraints to uptake
- Ensure that communication activities and dissemination are thought of from the inception phase of a project
- Involve farmers in the planning and design of communication activities and products to ensure that they are relevant to the needs and the particular communication environment within which people live and work.

Successful communication, as required to implement the above steps, calls for a well defined strategy to be put in place at the design stage of the project. Strategies require a first stage of understanding the communication context in which the project operates, it requires the development and pre-testing of information materials with users and

Table 1: Communication strategy planning table: Who should do what, how and when?

What needs to be done	How*	Who by	When
Identify Communications driver	Interviews Discussion	NR Research team	at start
Identify NR Research Output		NR research team	at start and throughout
Identify stakeholders and target audiences (intermediate and end users)	Participatory approaches (e.g.PRA/RAAKS, refs.2,5,6) Stakeholder analysis (refs. 3,4) Focus group discussions (ref 1)	NR research team PRA experts Social researchers	at start and throughout
Collaborate with intermediate organisations	Workshops(refs.5,6 Discussions	NR research team Communication expert	at start and throughout
Conduct communication context assessment	Secondary sources(e.g. statistical surveys) Focus group discussions (ref 1) Social Surveys (ref. 7) Participatory approaches (e.g.PRA/RAAKS, Refs.2,5,6)	Marketing expert NR research team PRA experts Social researchers Communication expert	early stages of project
Conduct Needs Assessment	Participatory approache (e.g.PRA/RAAKS, Refs.2,5,6) Focus group discussions (ref 1) Workshops (refs.5,6)	NR research team PRA experts Social researchers Professional workshop facilitators	at start and throughout
Identify communication objectives, and indicators	Workshops (refs.5,6) Target group discussions Participatory approaches (e.g.PRA/RAAKS, Refs. 2,5,6)	NR research team Target audience Social researchers Communication experts	
Develop media	Varies depending on what is needed but could involve participatory workshops (writing, picture making, video work) as well as discussions and Target audience workshopswith professionals	varies depending on what is needed - could involve all or any of: NR research team Communication experts Workshop facilitators Trainers	varies, depending on when above steps have been developed
Formative evaluation and pre-testing of media (needs to address ease of use, fitness for purpose, comprehensibility of text, pictures, symbols etc) with intermediate and end users	Observation of use Formal testing Focus group discussions Focus group discussions Workshops (refs.5,6)	NR research team Social researchers Communication experts	During media development
Monitor and evaluate media use with intermediate and end users	Observation of use Formal testing Focus group (ref 1) One-to-one interviews (ref 1,5,6) Workshops (refs.5,6) Social surveys (ref.7)	NR research team Social researchers Communication experts	Once media have been distributed
Monitor and evaluate overall communication strategy with stakeholders	Focus groups (ref 1) One-to-one interviews One-to-one interviews (ref 1,5,6) Workshops (refs.5,6) Social surveys (ref.7)	NR research team Stakeholders Communication experts	throughout project cycle

it requires regular participatory monitoring and evaluation. A communications strategy should give an overview of the communication problems, objectives, the selected audiences, core messages and appeals and the choice of communications channels, including media mixes (Table 1). There is a fair amount of literature written about how to develop a strategy (Coldevin, G. 1990; Garforth & Norrish, 2000; Norrish, Lloyd Morgan & Myers, 2001; Saywell & Cotton, 1999), what is lacking is documentation of experience from using a strategy and the ultimate impact of such a strategy, especially in process projects where documenting lessons learnt on the process is of great importance.

The Client-Oriented Agricultural Research and Dissemination Project

In Northern and Eastern Uganda, one mechanism being tested to improve financing and delivery of agricultural research is the introduction of competitive agricultural technology funds (ATFs). The ATFs are being established through the NARO/DFID supported Client-Oriented Agricultural Research and Dissemination Project (COARD), which is currently working in the Teso Farming System (Soroti (including Kaberamaido), Kumi, Pallisa, Katakwi) and the Lango Sub-Farming System (Apac and Lira). The ATFs, which are implemented by the NARO's Serere Agricultural and Animal Production Research Insitute (SAARI), promote pluralism in service delivery, through emphasis on an inter-disciplinary, inter-institutional teams to conduct research (e.g. through partnerships between NARO, local NGO and public/private extension); participatory demand-driven research, where farmers have a clear stake in the research process and outputs; and development of solutions in a systems context where the whole farming system and livelihood of farming communities is addressed rather than individual commodities. Strategic challenges for NARO include improving the flow of technologies and building partnership in technology dissemination (NARO, 2000). The COARD project can provide some important lessons (e.g. on how research can respond to demand from farmers, on how research and intermediaries can work together, on the kinds of capacity building needed) for meeting these challenges (Norrish & Ocilaje, 2001).

Developing a communications strategy

The Client-Oriented Agricultural Research and Dissemination (COARD) Project began the process of developing a communications strategy at the project's inception. The strategydescribes who will carry out communications activities and why, and when and how communications activities will be conducted. The basis for developing the strategy, used by the COARD project, is outlined in Table 1. The COARD strategy is developed at two levels, using this communications plan. The first level is for whole project, that is activities mainly associated with awareness raising and advocacy about the project and its objectives and for continuous lesson learning throughout the project. The second level is for activities associated with projects funded through Agricultural Technology Funds (ATFs). It is intended that every ATF project (and other projects at SAARI) have clear and operational communication strategies to ensure effective and efficient dissemination of project outputs and lessons learnt from the process, and hence more effective uptake of technologies by beneficiaries. Communications activities by the overall project will mainly focus on promoting the approaches and lessons learned from the whole project concept. Ideally, the strategy should be developed with key stakeholders to incorporate all interested parties views. Alternatively the strategy can be developed by a core group of 3-4 people and then presented back to a wider group of stakeholders. The COARD communications strategy was developed through the latter method.

COARD progress with communications

The COARD project has taken the following steps to develop the communications strategy:

- Production of a draft strategy, based on the project design
- Producing PR/awareness raising materials
- Presentation of the draft strategy to stakeholders
- Conducting an agricultural information scoping study in six districts of the Teso and Lango farming systems.
- Conducting a series of workshops on 'improving farmer, extension, research communication'
- Initiating a PR exercise for SAARI, to assess the reach of NARO technologies and farmers knowledge about SAARI
- The following steps are to be carried out throughout the project:
- Developing strategies with ATFs projects based on findings from AISS study
- agricultural information
- Provide an indication of farmers access to and use of different types of agricultural information and their needs from information

The first phase of the study aimed to provide an overview of agricultural Information sources produced for, and available to, farming households in the projects six districts. A sample of intermediaries was taken from those who are actively involved with communicating and disseminating agricultural information to end-users. Data collection tools were semi-structure interviews and actor linkage maps. Ten organisations were interviewed in each district using a randomly selected sample. At least 70% of organisations interviewed must be located more than 15km from the district headquarters. The second phase focuses on farmers' uses of and needs from agricultural information based on the following key research questions:

- Where do end-users get information?
- How do farmers access and seek information?
- Which factors affect adoption and up-take of intermediaries and end-users?
- How do farmers want to receive information in the future?

The sites for the farmer study were selected on the basis of one remote[1], one semi-remote[2] and one urban[3] sub-county in each district (Table 2). Fieldwork has so far been conducted in four districts. The sample comprised ten men and ten women farmers selected at random by the LC1 chairman. There was a range of ages and socio-economic classes. All respondents practice typical agriculture for the region and were not associated with any affiliated farmer groups.

The methodology for the farmer survey uses two PRA tools and a structured interview:

- **Structured questionnaire** is used to obtain background information (e.g. literacy rates, radio ownership, distance to local market) on the study site. In most cases this was completed by the LC3 and LC1.

- **Time line** documents major changes observed in their farming systems over the past ten or so years. Key information from the time line is built upon, using visualisation methods to explore further the source of information, the media type, the effectiveness of the information and farmers' future needs from agricultural information.

- **Pair-wise matrix ranking** identifies farmer's media preferences by ranking one media against another. The media identified were: radio, written, demonstrations, seminars and workshops, visits (by extension workers to farmers' farms) and visual.

Table 2: locations for farmer interviews

District	Katakwi				Soroti		Pallisa				Kumi		
Location	Remote	S-Remote	Urban	Remote	Urban	S-Remote	Remote	S-Remote	S-Remote	Urban	Remote		
County				Soroti	Soroti		Kibuku	Pallisa	Kibuku	Pallisa	Kumi	*Urban*	
Sub-county	Magoro	Wera		Tubur	Eastern Division		Kibuku	Puti-puti	Budaka	Kibale	Ngora	Kumi	
Parish	Omasia	Opiriai	Akoboi	Acuna		Dadas	Nalubembe	Puti-puti			Kowin		
Village				nk	Ojom		Minyani	Bubulanga	Kocheka	Akipany	Opot	Oogoria	

Improving farmer, extension research communication workshops

After the first phase of the AISS (Turrall et al., 2001) and following the development of the draft strategy, two development communications specialists facilitated a series of stakeholder workshops (Norrish & Ocilaje, 2001). The theme of the workshops was 'improving farmer extension research communication'. The aim of the workshops was to understand different service providers and users' needs from agricultural information, specifically that produced during and after a research project. The workshops fed into each other (farmer, extension and finally researchers) and also assisted in better understanding of the agricultural information context. In all the workshops participants worked in groups and used cards and flipcharts to visualise their responses. A facilitator assisted each group.

Farmers were selected with the help of the DAO and a local NGO using the following criteria (i) equal representation from men and women farmers, (ii) proximity to workshop venue and (iii) role in the community as farmers active in disseminating/accessing/using agricultural information. Eleven men and nine women farmers participated and they all actively pursue farming and in many cases have made changes to their farming practices over the last decade or so. Farmers were split into groups and led by a facilitator

BOX 1: Example of the kinds of questions asked of farmers

PARTICIPANTS

As farmers who will be involved in the project we would like you to tell us:

- how you would like to learn about the project and your role in it
- how you would like training structured and delivered (timing, phasing, how long, where, individual, group, demonstration etc.)
- how you would like to share what you are learning about improved soil fertility practices with the other farmers in the project
- how would you like to be involved throughout the project in things like record keeping, management of the trials and how would you like to share that information with the other farmers in the project
- what support would you like after the project is over what would be an effective way of sharing what you have learned with farmers OUTSIDE the project

NON-PARTICIPANTS

As farmers NOT involved in the project, but living in the same area we would like you to tell us:

- how would you like to learn about the project and what it is doing (before, during and after)
- how would you like to learn about what was learned during the project
- how would you like to learn about what is the right kind of soil fertility practice for your situation

Farmers were asked to consider an imaginary project, which was coming to their area. Three mini project descriptions (animal traction, seed multiplication, soil fertility) were provided, a different one for each group. Farmers were asked to consider how they would like training, information and support for the project to be handled both as if they were involved directly in the project and as if they were farmers outside the project (Box 1).

Twenty organisations identified during the AISS sent representatives to the intermediaries workshop. A presentation of the points raised by farmers at the previous workshop formed the basis for group work in which participants were asked to consider the following two questions:

- What are you organisations strengths and weaknesses in delivering what farmers want?
- What can be done to maximise strengths and minimise your weaknesses? Who could help you with this? (Note: a late start meant that this second question was not fully explored)

Intermediaries were divided into groups according to the type of organisation they represented (local NGO, government extension, private sector).

Seventeen participants (research officers and technicians) took part in the Researchers Workshop. They were first presented with the points from the farmers' workshop and the issues raised by the intermediaries. Participants were divided into three groups and asked to address the following:

Table 3: Actors involved with information exchange and access in remote, semi-remote and close to built-up areas

	Remote areas	Semi-remote areas	Near to trading centres and urban areas
Frequent (daily) access and exchange of information about agriculture	- **Parents** - Neighbouring - farmers	- **Parents** - Neighbouring - farmers	- **Parents** - Neighbouring - farmers - Radio - Local markets
Regular (weekly) access and exchange of information about agriculture	- Local markets - Churches	- Traders and - middlemen - Churches - Local markets	- FWE's - Churches - UNFA - Etop
Infrequent (monthly) access and exchange of information of agriculture	- Traders and - middlemen[1] - Etop	- FEW's - Local NGO's[1] - UNFA - Etop	- FEW's - Churches - UNFA - Etop
Rare (yearly or longer) access and exchange of information about agriculture	- FEW's - Local NGO's - operating at sub- - county level - UNFA		

- What are you organisations strengths and weaknesses in working with intermediaries (given their limited capacity and needs) in delivering what farmers want?
- What can be done to maximise strengths and minimise weaknesses? Who could help with this?

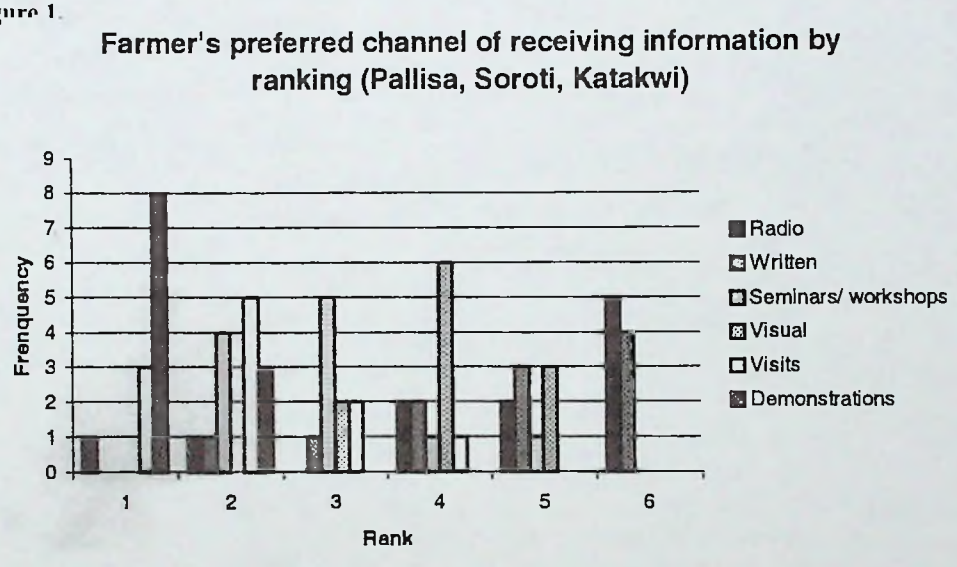
The Context for agricultural Information exchange and needs

The complexity of actors' information networks

The first part of the AISS found that the nature of communicating and disseminating agricultural information between intermediaries, researchers and farmers within and across district boundaries is complex (an actor linkage matrix was produced for each district). Findings suggest that AT(U), farmers, NARO and district extension offices are the clear channels for sourcing agricultural information. AT(U) and DEC offices also act as important up-take pathways of research outputs from NARO. Many of the intermediaries surveyed had heard or received information about the NARO institutes through another channel other than directly through the research institutes themselves.

Intermediaries either use one, two or a combination of medias of communication depending on the nature of their message. However, there seems to be a correlation between the type of intermediary (in terms of status, funding etc) and the capacity to transmit a message. Verbal interaction through visits, seminars, workshops, farmer-to-farmer and churches remains a popular form of communication although there are severe limitations; people passing information verbally are constricted by their mobility, their prejudices and their knowledge. Similarly, written materials in the form of leaflets, pamphlets and newspaper articles have their drawbacks.

Figure 1



Literacy levels remain low in many rural communities in Uganda and many people only read their local dialect rather than English. Local radio FMs in the districts visited continue to increase their broadcast coverage.

The complex multi-dimensional source of farmers' information

Preliminary findings from phase two of the AISS, indicates that farmers obtain agricultural information and technologies from a number of sources and actors in a complex and multi-dimensional manner (Table 3).

The social and economic factors that influence up-take are also complex and needs more analysis but from the preliminary research there seems to be a correlation between gender, location and capital wealth when compared with access and use of agricultural information. The main 'actors' mentioned were those easily accessible to farmers and are part of their social networks. These include parents and relatives who have a good experience and practice of agriculture and who are seen on a daily basis. Neighbouring farmers are frequently in contact with each other and discuss issues often in a social setting and can easily influence another farmer's behaviour and practice. Information is regularly sourced from local markets that are visited either weekly or fortnightly. The purchase of agricultural goods from market and the subsequent return of information are inextricably linked and cannot be separated. An individual farmer buying groundnut seeds for sowing for instance shall receive information on the variety, sowing dates and the kind of spray required. When

Table 4: strengths and weaknesses of different media for providing information on agriculture, as perceived by groups offarmers

	Strengths	Weaknesses
Demonstrations	- Experiential learning - Physical contact - Use of all senses	- In reality not always available - Only gives example of specific crop - or practice (i.e. intercropping maize with cotton)
Radio	- Good coverage throughout - districts (VOT the most popular - station) - Speediness of message - Reaches many people (good - for awareness raising and market - information	- Low ownership - Low access for women - Expensive running costs (cells, repairs etc.) - Easy to miss information - Programmes Not repeated - Language (e.g. no separate channel - for Kuman speakers in K'maido)
Written	- Good at reinforcing a farm trial - or demonstration - Good interface between - literate and illiterate	- Low literacy rates - Difficult to understand without explanation - especially technical words - Poorly illustrated materials can confuse - and complicate message inhibiting up-take
Visits	- Ability to ask questions - Given technical advice	- Rarely occur - Only a selected number of people benefit - Little reinforcement
Visual	- It uses all the senses	- The inability to ask questions of what is seen and heard (a mis-perception as there would most probably be someone there to answer questions)
		- Attendance at night may be small in some areas such as Katakwi due to current instability and unrest.
Seminars and workshops	- Farmer's benefit from clear - Ability to ask questions - explanations·	- Not everyone can be present Access may be a problem because of location, distance and lack of available transport
Data source: combined responses from 10 different groups of farmers (160 respondents) in Pallisa, Soroti, Katakwi Districts.		

farmers exchange goods, information is also shared. This was particularly evident when farmer's purchase seeds although not every farmer trusted the information they receive from traders. A number of farmers cited buying chemicals for spraying as an example of the latter.

Farmers views on the strengths and weaknesses of media type

The pairwise ranking identified farmers (Pallisa, Kumi, Katakwi and Soroti districts) preferred media types for receiving information. It appears that they prefer to receive information on agricultural practices and technologies through demonstrations and visits (by field extension workers to their farms) rather than any other type of media. This preference was followed by visits, seminars and workshops which, similar to demonstrations, has a human component built into its communication (Figure 1). Receiving agricultural information through visual means or through workshops and seminars appears more popular than information received through radio and written forms, which receive the lowest ranks. Farmers were then asked about the strengths and weaknesses of the media types they ranked (Table 4). In most cases one form of media to provide specific information is not sufficient. For example, through the radio it is easy to 'miss information' and written information is good for 'reinforcing a farm trial or demonstration'.

Improving farmer, extension, research communication

Farmers' needs from research

- The farmers attending the workshop had clear, strong views on what they want particularly in relation to training. They expressed a need for:
- Theoretical understanding and hands on practical learning (e.g. exchange visits, study tours,

demonstrations)
- Reinforcement in the form of follow up visits, formalised farmer-to-farmer, printed material
- Advice on hand both during and after a project
- Working in groups and regular discussion groups (1 or 2 a month)
- Phased training depending on season and technology (1 week maximum at any one time) in an accessible location

Being trained to train others Farmers also said they want more information at the start and throughout a project whether they are directly involved or not (e.g. radio, pamphlets, exchange visits). They also want more specific information that may not be directly related to the research outputs, but has strong implications for how they can be used (e.g. post-harvest, marketing, how to access credit). There is preference for information through a variety of channels (e.g. radio and face-to-face and leaflets) as crucial information may be missed if dissemination is only through one channel.

Intermediaries response to farmers' needs

Participants at the intermediaries workshop were very receptive to farmers' views, but identified the main reasons for not providing such services as inadequate funding and skills available for dissemination activities and in particular for the writing, production, reproduction, and distribution of dissemination materials and for repackaging information (especially for translation). Although some organisations have the skills to carry out activities, the numbers of staff are insufficient and resources not available to train more. Whilst Farmers Associations have dedicated funds for dissemination, these are not sufficient for effective dissemination. In addition, many NGOs cover large geographical areas so cannot really deliver effectively in terms of training and support for farmers. Government extension is de-motivated for many reasons (e.g. low salary, no recognition, no support for activities) and feels it cannot compete with NGOs in fieldwork activities. Intermediaries felt their capacity to cope with what farmers want would be enhanced by the following:

- Documenting and sharing what is being done and more active sharing in networks. At present the network organisation communicates with the members, but there is little communication between members and the centre or between different members. They would also like some kind of centralised location, easily accessible where they could go to find out what information is around.
- More equal co-operation between research and NGOs (at present NGOs request help from research, but it doesn't happen the other way round). Research stations need to be more active in sharing with NGOs.
- More regular outlets for information to be made cheaply available (e.g. pages in newspapers).
- Regular needs assessment due to constant changes in the environment (policy, markets etc), which are outside farmers' control.
- Planned fund raising and better utilisation of available funds.

Strengths and weaknesses of researchers working with intermediaries

Researchers were asked to consider their organisations strengths and weaknesses in working with intermediaries (given their limited capacity and needs) in delivering what farmers want. They were also asked to consider how they could maximise their strengths and minimise their weaknesses.

Strengths: One of the main strengths of SAARI was seen to be the range of technologies (and supporting information) already available and the ability of researchers to generate new technologies. This is complemented by:
- skills in working with farmers in on-farm trials and in a range of dissemination approaches (e.g. Field days in SAARI, exhibitions at agricultural shows, farmer guides, pamphlets, a limited supply of foundation seed)
- the existing contacts with intermediaries and farmers in such activities as pre-season workshops with NGOs and farmers, participatory identification and needs assessment and planning, research, on-farm evaluation with farmers and the sharing of findings.
- a willingness to co-operate and collaborate with intermediaries. This is being fostered by the COARD project, which is providing a supportive environment (through ATFs) in which closer links with intermediaries can be developed.

Weaknesses: The strengths are countered by the two main issues raised by all groups and by intermediaries. These are inadequate funding and trained personnel with the knowledge and skills needed for extension activities and the dissemination of technologies, communication, materials development, and monitoring and evaluation. Other weaknesses identified include a limited and inadequate understanding of stakeholders roles and of the interests of the intermediaries, and a limited access to uptake pathways. The often conflicting institutional interests, priorities, and strategies of intermediaries and researchers escalates the problem. Finally researchers at SAARI are hampered by the lack of a PR programme for the institution. This is much needed as farmers tend to attribute the new technologies to the intermediaries rather than to the research institutions through which they have been developed. This fact was also commented on in some earlier research into uptake pathways by NARO (NARO, 1999).

Maximising strengths, minimising weaknesses: Researchers felt their strengths could be maximised and their weaknesses minimised by getting a better understanding of stakeholders interests through some form of stakeholder analysis and through continuous needs assessment with farmers. This understanding would enable the joint planning of well focused research programmes with all the stakeholders. These programmes would incorporate budgets for dissemination and monitoring and evaluation from the start. Follow-up by field extension workers would be built into all projects.

Finally a need was expressed for developing a mechanism to enable a quick response to local needs for dissemination materials. A communication unit for production of training materials and other media was suggested as one mechanism, however, developing the capacity of intermediaries to respond to local needs is probably a better option. This might also help to fulfil the need to widen dissemination channels through better collaboration with local councils, local leadership and farmer groups. This need was previously identified in a NARO study on uptake pathways (NARO, 1999).

Discussion

Implementing a communications strategy

The COARD project and SAARI has realised a need for developing and implementing a communications strategy to improve the dissemination of research outputs. Both the development of the strategy and implementation are still in the early phases, but it is clear from work conducted so far, both in awareness raising (e.g. production and distribution of a project flyer, producing quarterly bulletins) and in understanding the communication context in which the project operates, such a strategy is necessary. It can also provide a valuable monitoring and evaluation tool. What is clear so far is that it requires a lot of time and resources and ideally at least one team member should be allocated the communications task as a full-time position. The findings at farmer level, so far indicate that farmers associate technologies with the intermediaries who supply them, rather than the actual source.

The workshops on improving farmer, extension, research communication were valuable for obtaining a general, initial overview to how each group of stakeholders perceived their role in dissemination and their needs from dissemination. The workshops also provided a good forum to get different actors to think about the value of networks and their roles within those networks. The workshops indicate that farmers have clear views on what they want particularly in relation to training, to the kinds of support that they need for adopting new technologies, and for the kinds of communication support, which they prefer. Intermediaries and researchers have much to offer farmers, but are hampered by the lack of funds and of skilled and trained personnel, particularly in relation to communication and dissemination. Overall the workshops have revealed a remarkable degree of agreement on the issues confronting research, extension and farmers as they try to improve communication between and amongst themselves. Whilst some of the new measures on outreach (NARO) and agricultural extension (NAADS) will have a significant role to play in providing information and training to farmers they are not currently in place and it will be some time before they are fully operational. The COARD project is established and currently has fifteen funded projects through the ATFs. This provides an excellent opportunity to test different combinations of the suggestions made by farmers, intermediaries and researchers for improving dissemination of research outputs. The AISS provides valuable information on the types of media that should be used, and the network of actors involved in the production, multiplication and dissemination of information.

Networks for information exchange

What we see from the intermediaries study is a complicated network of players who are essential and key players in the dissemination of agricultural information. The ATFs projects provide the opportunity for improving linkages and networks with research, through the promotion of partnerships in the agricultural research and dissemination process. Although in its early stages there is an immense opportunity to build capacity within these organisations for disseminating agricultural research outputs. Mechanisms need to be put in place now, so that lessons learnt from these process projects are fed into the wider research agenda.

Media use for disseminating information

From the AISS study, it appears that radio is not the farmers most preferred media for receiving information about agricultural technologies, yet this is probably the main media use for disseminating research outputs at the current time. Most project proposals emphasis a radio programme and a newspaper article as the dissemination means, however, farmers do not prefer these forms, nor are they easily accessible to farmers in this region. This highlights the importance of planning dissemination and the need to clearly understand the target audience, the communication objective and the most appropriate media form.

Conclusions

The systems for the production and exchange of agricultural information are complex and are not well understood, nor are they fully developed in the Teso and Lango Farming systems. Intermediaries play a vital role in transmitting agricultural information, but this is mainly through verbal means although there is evidence

that they are improving their communication structures and networks through up-dated communication technologies and through better networking techniques. AT(U) and UOSPA play important roles in communication agricultural technologies to farmers through a combination of medias. These and other intermediaries obtain their information from a wide range of sources but many of the smaller intermediaries have little written material to disseminate. Intermediaries appear not have considered the different communication needs of their clients, nor is there evidence to suggest intermediaries pre-test information materials, or follow-up on the effectiveness and use of materials. Reasons for this include inadequate or no training on communications and dissemination and insufficient funds for communications activities. The same is generally true of SAARI, who has no communications strategy or systematic mechanisms for disseminating information and technologies where the end-users communication needs have been considered. The fact that farmers appear to prefer demonstrations, visits, visual and written media above radio questions the dissemination methods being used at present.

It is clear that there is a need to raise awareness and capacity initially amongst the ATFs projects teams (who comprise a broad range of stakeholders) in relation to the need for an underlying communication strategy; in uptake and dissemination; in the preparation of materials; in monitoring and evaluating the impact of communications activities and material.

There is a need to identify and support networks that improve and enhance linkages between the different service providers. This may involve a study on partnership processes to investigate the type of links between different players, the nature of information flow and messages between different sub-systems (for example between research and agricultural educators; between agricultural educators and farmers; between farmers and research).

There is a need to develop a communication strategy at the start of the project, with stakeholders, with clearly defined roles amongst the project team for communications activities. This includes identifying indicators for monitoring and evaluating communication activities, so that lessons learnt about participatory processes can be fed into other programmes and policy.

Overall it is difficult for participatory practices and wider dissemination mechanisms to be implemented by researchers without a supportive policy environment, capacity in communications skills and an institutional environment that encourages and supports wide dissemination and implementation of participatory approaches. Finally, Ramirez (1997) provides a good summary of the importance of communication, 'a pattern appears which confirms that communication for development can become a powerful tool, a meeting ground, for sustainable development when attention is given to a strategic use of communication and information activities designed to meet specific needs and applications with a balanced approach to the three roles of communication:

- Transfer of ideas, insight and technology;
- Awareness raising on policy and institutional issues;
- And, facilitating communication among actors with a stake in natural resource management.

References

Adam, G. and Harford, N., 1998. *Health On Air: A Guide to* Creative Radio for Development. Health Unlimited, London, UK.

Coldevin, G. 1990. Communication strategies for rural development: a case study of the use of campaigns in Lesotho.

Engel P. G.H. & M. Salomon. 1995. *Facilitating innovation for development: A RAAKS resource* box. *Royal* Tropical Institute, The Netherlands

FAO. 2000. *Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD). Strategic* Vision and Guiding Principles. *Food and Agriculture Organisation of the United Nations, Rome, Italy.*

FAO. 1996. *Artists as experts, a participatory methodology to produce traditional and popular media. Rome,* FAO.

FAO. 1995. *Understanding farmers' communication networks. An experience in the Philippines. Communication for Development Case Study* 14. *Food and Agriculture Organisation of the United Nations, Rome, Italy.*

Farrington, J. & Edwards, D., with Ler, J. 1993. *Review of the Factors Influencing the Uptake and Impact of ODA-supported Renewable Natural Resources Research.* Overseas Development Institute, London, UK

Garforth, C. 1998. Dissemination pathways for RNR research. *Socio-economic Methodologies. Best Practice Guidelines. Chatham, UK: Natural Resources Institute.*

Garforth, C. and Usher, R. 1997. Promotion and uptake pathways for research output: a review of analytical frameworks and communication channels. Agricultural Systems, *55(2): 301-322.*

Garforth, C.J., & Norrish, P. 2000. Communication perspectives on uptake and adoption. In: *Sustaining change: proceedings of a workshop on the factors affecting uptake and adoption of Department for International Development (DFID) Crop Protection Programme (CPP) research outputs.* Hainsworth, S.D. *and Eden-Green, S.J. eds. Imperial College at Wye, Kent, UK. 21-23 June, 2000. Natural Resources International Ltd, Chatham Maritime, Kent, UK.*

Grimble 1998. *Stakeholder Methodologies in NR Management.* DFID, London.

Hainsworth, S.D. and Eden-Green, S.J. eds. 2000. *Sustaining change: proceedings of a workshop on the factors affecting uptake and adoption of Department for International Development (DFID) Crop Protection Programme (CPP) research outputs.* Chatham, UK: Natural Resources Institute.

Lightfoot, C & D. Minnik. 1991. Farmer-based methods: Farmers' diagrammes for improving methods of experimental design in integrated farming systems. In Haverkort et al. (eds). *Joining Farmers' experiments: Experiences in participatory technology development.* IT Publications, London.

Mulhall, A. 1999. *Development of an NRSP strategy for the dissemination of completed projects. Report to DFID Natural Resources Systems Programme.* Hemel Hempstead: HTS Ltd.

NARO. 1999. *Technology development and transfer a nation-wide survey.* NARO, Entebbe.

NARO. 2000. *NARO Annual Report 1999-2000.* NARO, Entebbe.

Norrish, P. and Ocilaje, M. 2001. *Communications for COARD: consultancy report.* Serere: COARD Project, SAARI, Uganda

Norrish, P., Lloyd Morgan, K. and Myers, M. 2000. *Improving communication strategies for the promotion and dissemination of NR research outputs to intermediate and end users.* Volume 1. *Final Technical Report Project R7073 (SEM/NRSP).* Reading: AERDD, The University of Reading.

Norrish, P., Lloyd Morgan, K. and Myers, M. 2001. Improved communications strategies for renewable natural resource research outputs. *Socio-economic methodologies for Natural Resources Research. Best Practice Guidelines.* Chatham, UK: Natural Resources Institute.

ODA, 1995 *Guidance Notes on How to Do Stakeholder Analysis of Aid Projects and Programmes* (July) *London:* Social Development Department, DFID

Pretty J., I.Guijt, J. Thompson and I. Scoones. 1995. *Participatory Learning and Action: a Trainers Guide.* London IIED

Ramirez, R. 1997. Communication: a meeting ground for sustainable development. XI World Forestry Congress. 13-22 October 1997, Antalya, Turkey. Special Paper on Topic 30.

Ramirez, R. 1998. Participatory learning and communication approaches for managing pluralism. *Unasylva* 194, 49: 43-51

Röling, N. 1988. *Extension Science: Information systems*

in agricultural development. Cambridge University Press.

RTG (Research Task Group). 1994. *Final Report. Renewable Natural Resources Research Strategy 1995-2005.* London: DFID.

Saywell, D. and Cotton, A. 1999. *Spreading the Word: Practical Guidelines for Research Dissemination Strategies.* Loughborough: WEDEC, Loughborough University.

Theis, J. and H. Grady (1991) *Participatory Rapid Appraisal for Community Development.* London IIED Sustainable Agriculture Program and Save the Children.

Turrall, A. 2001. Agricultural Information Scoping Study. Draft report on a field study conducted with Intermediaries. Serere: *COARD Project, SAARI, Uganda.*

Wilkinson J., 1985. *A guide to basic print production.* The British Council and Intermediate Technology Publications.