Experiences of packaging research outputs into extension materials

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Abstract

Research dissemination is one component of research that still faces many hindrances, which counteract the numerous impressive arrays of research technologies being constantly generated. This in turn defeats the primary objectives of research, which aim to build knowledge and raise awareness through its uptake and scaling up. It has long been realised that there are many technologies that remain under-disseminated which, if they were being fully disseminated, could be adding to the number of uptakes of technologies by end users. This paper details the experiences of the Linking Project during the process of packaging research outputs into extension materials. The paper also discusses several options that may reduce the bottlenecks occurring in dissemination of research. Based on the authors' experiences in packaging extension materials, issues discussed include the accessibility of research outputs, the academic nature of research papers, the relevance of messages and medium to target audiences, dissemination budgets, and skilled human resources. The authors recommend that research projects should incorporate dissemination resources including adequate finance and skilled personnel at project conception level, and allocation of realistic time-frames for dissemination activities going beyond project phase-out in order to maximise impact of research.

Keywords: Bottlenecks, dissemination mediums dissemination resources, research disemination

Introduction

There exists an impressive array of technologies generated by researchers. However, despite some examples of successful technology adoption, many technologies remain un-adopted or only adopted by a minority of potential users (NARO, unpublished).

There are a number of reasons for this. One is where research has been produced in a narrow academic context and has not been communicated widely (Gundel *et al.,* 2001). A second reason is that, where there has been an attempt to communicate widely, the form, content and language of the communication materials have not been appropriate to the intermediate or end user. A third reason is that even where communication has reached and informed its intended target, the inputs, credit, markets and long-term technical support mechanisms are not in place to encourage adoption. Lastly research may not be relevant to the users, or may not be responding to a demand expressed by users.

According to Lang (2003) research has two primary objectives: a) to build new knowledge; and b) to disseminate that knowledge and raise awareness of its potential applications. The knowledge gap between researchers and technology users has been recognised in the recent review of the Ugandan NARS (MAIF, 2003).

The fact that un-disseminated research outputs have been accumulating, while farmers are still looking for appropriate technologies to address their production constraints, has triggered some research institutions to address this problem in Uganda. These include the Client-Oriented Agricultural Research and Development project (COARD), the Agricultural Research Information Service (ARIS), the Outreach and Partnership Initiative of NARO (OPI), the National Agricultural Advisory Service (NAADS), Makerere University and the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF).

This paper concentrates on efforts to "translate" academic research outputs into user-friendly formats that contain information that responds to farmer demands. In particular, it highlights the experiences of the DFID-supported research project *"Linking demand for and supply of agricultural technologies in Uganda* in packaging research results from DFID's Crop Protection and Livestock Production Research Programmes into fact sheets for the use of intermediate and end users.

Methodology

Why fact sheets?

The joint donor/NAADS review workshop of May 2003 highlighted the need of private extension service providers for up-to-date technical information (Garforth and Kizauzi 2003), so that they can provide high quality advisory services to farmers in NAADS pilot districts.

In addition to technical information, farmers also need locally applicable information on inputs, markets, credit,

economic benefit, labour implications, farming system implications and other socio-economic/farm-management aspects, before they can take a fully-informed decision about adoption. Furthermore, farmers are a heterogeneous group, and the technical and socio-economic information therefore needs to be interpreted and presented in different ways for different groups of farmers (women and men, literate and illiterate, market-oriented and subsistence-oriented, resource-rich and resource-poor, remote and near-to-market). The question then arises as to how research findings should be broken down into steps and components that are easy to understand, and that answer all the questions farmers (users) and intermediate users might have.

Fact sheets are brief information sheets about a number of key aspects of a particular technology. They usually contain photographs, simple figures and tables, and text. The text describes the technology and provides information relevant for potential users. It also provides contact details and origins / sources of the technology. Fact sheets can distil large volumes of often academic research findings into a few pages of relevant information. They can form a stepping stone in the process of developing extension materials of different types for a number of different audiences, but with an emphasis on private agricultural extension service providers operating in NAADS sub-counties in Uganda. Fact sheets, being relatively short and simple, can be easily up-dated, and can provide the basis for location-specific dissemination information (local language, local prices, diagrams or photographs of operations done using local methods etc).

The process

The process leading to fact sheets generation, as used by the Linking Project, is shown in Box 1.
The first step towards developing a fact sheet is the identification of farmer demand. The subsequent fact sheet can then be tailored to the specific technical and socio-economic needs of client farmers.

In the NAADS system, farmer groups at parish level are assisted by NGOs to identify their priority commodities. These priorities are then aggregated at sub-county level in farmer's fora, such that three (previously six) priority issues (commodities or cross-cutting issues) are identified per sub-county. The Linking project staff visited the NAADS sub-counties in Arua and Tororo Districts to discuss these priorities with farmer forum members.

Although all visited sub-counties had managed to put together impressive ranked matrices of prioritised enterprises, some of the groups had not specified specific constraints on which they required advice from private service providers. For example, some farmer groups identified "goats" as a priority enterprise, but did not specify what aspect of goat rearing the group needed information – whether it was constraints related to housing, markets, feeding, diseases, or pests. In cases where the constraints were specified (e.g. goat health), information was lacking about the nature of the health problem, .e.g. ticks, or endo-parasites such as tapeworms. This lack of detail made it more difficult to match

CPP and LPP technologies to farmer priority enterprises and constraints, thus requiring discussions with sub-county farmer forum members.

In addition to in-depth discussions on their specific problems, sub-county farmer fora members were also asked about the format in which they would like to receive extension information. For that purpose, draft fact sheets were shown to them, as well as existing extension booklets and leaflets. Farmers stressed the importance of illustrations to make information materials attractive and accessible for people with limited literacy skills. The most recurrent comments on information presentation and content were the following:

- Lack of literacy is not perceived as a hindrance by farmers who feel that farmers and family members can help each other in understanding / interpreting written information.
- There was no consensus about English versus local languages. Some farmers clearly preferred their vernacular, but others pointed out that most of those who can read and write also know basic English and would be able to understand information written in simple English
- Include pictures and diagrams in the extension materials that are self-explanatory
- Include a step-by-step guide on how to use a technology
- Include a formula on how to calculate costs of adopting a technology rather than the actual costing, as these vary across locations and seasons, and can become quickly outdated
- Include, where possible, technology options and rough cost comparisons (financial, time, labour, etc) between options, so that farmers can make an informed choice
- The format in which information is presented appears to be less important than providing access to information for a wide range of farmers
- Technology demonstration was the most preferred method for dissemination, followed by videos, drama, radios, posters, exposure trips and exchange visits (in no particular order). Theoretical classroom training was least preferred
- Farmers requested written hand-out materials for future reference, wherever training is given
- Dissemination materials should include input availability and location
- Advisory service providers should be available at a local central point for quick consultation with farmers
- Marketing emerged as the most cited constraint by farmers (including issues such as bulking of produce, processing and value addition, quality control, prices and transportation of produce to markets)

Following these discussions, the information needs of farmer forum members were matched with CPP and LPP Research Programme outputs as shown in the process in Figure 1. Subsequently, using the guide checklist headings in Box 1, the fact sheets were compiled.

The following section discusses the experiences of the Linking Project with the process of composing fact sheets based on research reports from the Crop Protection and Livestock Production Programmes of DFID.

Discussion of the experience of the "Linking Project" in developing fact sheets

The project faced a number of difficulties in developing fact sheets, which are discussed in detail in the sections that follow.

- Many CPP/LPP project findings are left as large technical reports, with no "translation" into more accessible formats or language
- It is difficult and time consuming to access the final technical reports, especially for those not familiar with the RNRKS system.
- It takes a long time to read the lengthy reports and to extract practical information relevant to farmers from them.
- The type of information needed by farmers to decide whether to adopt the technology or to use it in a practical way is often not available from the project outputs.
- In order to get all the information available one often has to follow a trail of project documents going back to previous phases of the project. Again that is very time consuming, and sometimes confusing.
- Technical reports are often written for an academic audience, and are difficult to translate into user-friendly language for non-academics.
- There are often no clear conclusions that can be converted into recommendations for farmers
- Technical reports rarely include photographs, drawings or diagrams that can be used in extension materials to illustrate the technology.

Difficulties encountered

The outputs from research projects require translation before they are useable as dissemination material

While there a few stand-alone manuals which have been developed by CPP and LPP projects (such as the Groundnut Manual, Draught Animal Power manual, and smaller ones such as the BAIF brochure on de-worming of goats in India), and other publication methods such as academic journals and professional papers, most LPP and CPP programme outputs are published in the form of research reports. In the period 2001-2002 CPP published 159 internal publications and reports as compared to 38 briefing notes, newsletters, technical leaflets, manuals, handbooks, booklets, and postcards (NRIL 2002). WEDC, in Gundel et al (2001), give a comparison of the relative advantages and disadvantages of documentary and non-documentary dissemination modes, highlighting the disadvantages of research reports as a medium for dissemination to non-researchers (see Table 1). From this table it emerges that research reports provide a detailed summary of research, mostly to satisfy funding requirements and/or those with a high level of understanding of the subject, as well as providing a single reference point for all aspects of the research. The main disadvantage of publishing research reports is the assumption that the report is going to be read by a single audience group. The report's written style then becomes a barrier to other groups who may be interested in the research outputs.

Getting hold of research reports was time consuming

The accessibility of research reports and other dissemination materials was difficult, involving a long process of writing to project leaders and/or the Programme managers. The process of acquiring a single research report took from a few days to more than two weeks, and required much correspondence. This was exacerbated by delays in communication, especially with project leaders, due to travel, tight schedules, having changed place of work since the project, or retirement. A recurring problem was that research projects were not undertaken by a single person; it was therefore rare for the project leader to know answers to all queries raised.

Complete research reports were not available on the internet. Electronic versions were available but could only be obtained from project leaders or programme managers. On the CD ROM of DFID RNRRS Programmes, two page project summaries are available but were found to be inadequate in providing information for the fact sheets.

The essence of the research findings were not easily extracted from technical reports

Once the research reports were received, much time was spent reading the reports. Extra care in reading was required so that the reader could gain a clear understanding of the research outputs and identify tangible technologies with potential use for farmers. If there had been dissemination materials to go with the main research reports, reading the whole reports would have been necessary only as a source of further information to clarify queries or to gain more understanding of the issues.

Reports lacked information essential to farmers

Some research reports lacked vital information for putting together a fully comprehensive fact sheet, resulting in having to consult or generate additional materials. This scenario usually occurred when the reports had missing information to fulfil the fact sheet checklist (Box 2). Having gone through this experience, it would make much sense if research reports categorically stated in the executive summary the contexts in which a technology can be replicated, so that interested users do not have to read a whole report.

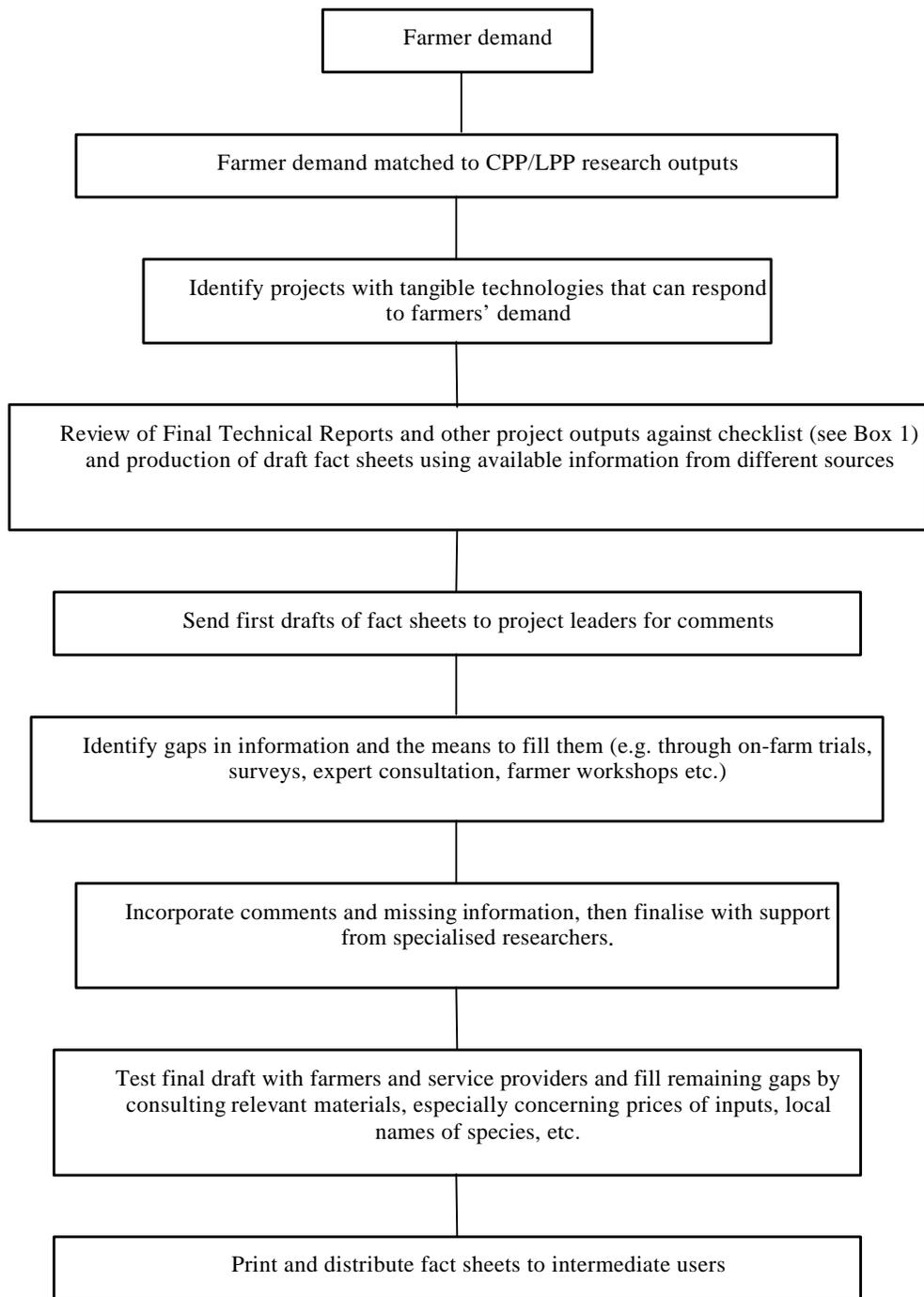### *Reports were sometimes confusing, lacking clear statements about the successor failure of technology*

Farmer demand

Farmer demand matched to CPP/LPP research outputs

Identify projects with tangible technologies that can respond to farmers' demand

Review of Final Technical Reports and other project outputs against checklist (see Box 1) and production of draft fact sheets using available information from different sources

Send first drafts of fact sheets to project leaders for comments

Identify gaps in information and the means to fill them (e.g. through on-farm trials, surveys, expert consultation, farmer workshops etc.)

Incorporate comments and missing information, then finalise with support from specialised researchers.

Test final draft with farmers and service providers and fill remaining gaps by consulting relevant materials, especially concerning prices of inputs, local names of species, etc.

Print and distribute fact sheets to intermediate users

Figure 1: Process of fact sheet development to meet farmer demand for information

Box 1 Checklist of fact sheet headings (Linking Project)

-      Fact sheet number for easy identification
-      Title of fact sheet (the technology or technique)
-      Summary of the technology in 2-3 lines
-      Description of the technology
-      Who is the technology useful to (what type of farmer, gender, environment, etc.)
-      Resources required for the technology to work (inputs, labour, equipment, land, water etc)
-      Availability of the resources
-      Cash costs to farmer of implementing the technology
-      Economic and other benefits to the farmer
-      Market information
-      Impact of technology (on natural, financial, human, social, physical capital)
-      Photo(s), figures, diagrams, tables as necessary
-      Available or upcoming extension materials, with cost and availability
-      Source of further information (reports etc; contact details to project leader if appropriate)
Attribution of the information contained in the fact sheet (e.g. This information was derived from DFID project number ------, which was carried out by -----institution in collaboration with ---- institutions in ----)

Source: Linking the demand for, and supply of, agricultural information in Uganda

Box 2. COARD project fact sheet generating process

1. A workshop was held with Ugandan research institutes scientists, COARD Project supported Project Leaders and NAADS Service Providers, to develop agricultural extension messages
2. Attendees brought with them generic messages (plus any relevant materials such as photographs) they wished to develop into an extension message
3. The participants, together with communication consultants (graphic designers, illustrators) and content development specialists, developed clear messages to form the basis of extension materials
4. Each participant developed one draft leaflet and one poster (depicting the same message) by the end of the fourth day of the workshop.
5. Workshop participants discussed the practices and principles of pre-testing and carried a practice run with a group of local farmers and extension workers prior to each participant pre-testing fact sheets in the field
6. After the workshop, each participant was responsible for pre-testing their message in the field, and with permission from their institute, the messages could then be mass produced

Source: Personal communication with COARD staff

Box 3: Proposed process for adaptive testing of technologies

1. Collect information/literature relevant to the technologies
2. Evaluate that information against the Linking Project's fast sheet heading (Box 1) and identify any gaps in knowledge relevant to conditions in a specific area
3. Meet with a sample of farmers and service providers to further identify any other gaps in the information needed by them in order to assess and use the technology
4. On the basis of the missing information, design activities that will provide information to fill the gaps (surveys, studies, on-station /on-farm trials etc)
5. Conduct the activities, with participation of relevant stakeholders
6. Provide feedback to farmer groups and confirm results of the activities
7. Based on the results, develop draft extension materials in formats useful to service providers and different target audience
8. Test the extension materials with farmers and service providers, and modify as necessary
9. Finalise, print and disseminate extension material

Source: Linking the demand for, and supply of, agricultural information in Uganda

Table 1. Relative merits of different dissemination pathways

Pathway	Comments	Advantage/s	Disadvantage/s
Working documents	Concepts notes, field diaries and reports for internal use	• Target research findings to particular groups	• Limited audience
Research reports	Detailed summary of research to satisfy funding requirements or those with high level of understanding of subject	• Single reference point for all aspects of the research	• Limited audience
Academic, refereed journal	Directed at research community	• Wide impact on intellectual networks	• Limited audience
Professional journal	Directed at practitioner community	• Practitioner oriented journal	• May lack academic rigour
Stand-alone manual	Single product for single audience	• Typically encompasses all research findings from project	• Difficult to identify salient points for specific target group
Conference, workshop seminar	Face to face contact with peers of specific subject	• Learning and networking of professionals	• Expense • Limited audience
Training manual	To support an active training process	• Applied knowledge	• Limited audience • Expense
Networking	Association or individuals/ organisations sharing a common goal or purpose who contribute resources in a two-way exchange	• Reaches members who share common research interests • Interaction, discussion and review of findings	• Low active participation • Strong incentives needed for participation • Time consuming to manage
Internet, e-mail	World-wide electronic network of linked computers	• Immediate, convenient • Wide interest in electronic media	• Limited access in the South / "cyber divide" • Underdeveloped potential • Expense
Popularisation, mass media	A means for reaching a wider audience; influencing policy from bottom, uses mass media	• Reaches wide audience • Bottom up influence	• Diluted core message
Participatory techniques	Knowledge generation and diffusion as integral process with strong stakeholder involvement	• Practical guidance at community level	• Time consuming

Source: Adapted from WEDC (undated); In Gundel *et al*. (2001)

The level of English in many reports was often very academic, proving very difficult for those not familiar with the research topic. It is doubtful whether the research results can be understood well enough to be replicated correctly, considering the interferences occurring when transmitting information through a chain of transmitters and receivers who interpret other people's work. The Linking project relied on project leaders to proof-read the draft fact sheets and correct any misunderstandings which may have occurred. There were many such occasions when mistakes were unintentionally made. One example of this occurred when a draft fact sheet was sent to a project leader whose comment was that 'the project had not been such a success as was implied in the fact sheet.' Although it can be argued that requiring project leaders to 'proof-read' draft manuals creates more work for them, it is felt here that it is a worthwhile process. If the draft fact sheets in question had not been sent to the project leader there was a very high chance of recommending a technology that was unlikely to work unless changes were incorporated.

This point raises a question on how "honest" research reports are. Are researchers tempted to justify the project before donors? If so, failures or difficulties may not always be clearly articulated. Many technical reports failed to answer

such important questions as; was the technology successful or not? Why did it fail, and how can the technology be taken forward- if indeed it should at all!

It was difficult to find photographs or diagrams to illustrate extension materials

Just as difficult was the process of getting hold of photographs or drawings depicting the messages projected in the fact sheets from project the leaders. In most cases the Linking Project relied on the internet with considerable amounts of time spent searching for meaningful photographs.

An alternative process of producing fact sheets: the COARD process

The process of writing fact sheets by people other than those involved in the original research project requires considerable time and effort. An alternative route to the Linking Project was taken by COARD (the DFID funded project "Client Oriented Agricultural Research and Dissemination") in Uganda. They conducted workshops which brought together NARO researchers that were directly involved in developing the technologies, agricultural extension service providers and media specialist consultants. This enabled the team to have extension materials which were ready for pre-testing within a one week period workshop. The COARD process is outlined in box 2.

Our opinion is that both methods have disadvantages, cost being the most quantifiable. The COARD workshops produced 90 different extension materials (45 leaflets and 45 colour posters) for a budget of £10,000. The Linking project produced 20 draft fact sheets costing approximately £1000. Clearly, it can be seen that both processes are expensive. The question is whether it would cost the same amounts if these fact sheets were a compulsory part of a research project and produced by the researchers as part of the research outputs.

Furthermore, neither the fact sheets that the Linking Project produced, nor the dissemination material that COARD together with Uganda research scientists produced from their workshops, contained the comprehensive set of information that is needed by farmers to make decisions on technology adoption or rejection. During the process of compiling the fact sheets, it was common to find that local market prices, availability of local materials, risk estimation, economic benefits and, other vital information were missing.

The Linking Project is piloting adaptive research process that identifies these gaps in information and then conducts activities (trials, surveys etc) to fill these gaps, leading to a rounded set of information (see Box 3).

Feedback. There is a need to collect feedback on further results of trials after the initial research project. The Linking Project found that it was difficult to know if any of the technologies recommended by research projects had been tried further, and if they had been tried, what the results were. It would be immensely valuable if a system was put in place which captures this further work therefore creating an iterative cycle of learning. However, the authors were fully aware of the enormity of this activity, the costs and, coordination requirements considering the limited duration of most projects.

The way forward

A way forward needs to be found to make those technologies that are potentially useful for farmers, but are still "on the shelf" available to intermediate and end users, but that also stops recurring dissemination bottlenecks in research. Questions that need to be addressed include: what is the best way forward in future dissemination of research? Do research Programmes need to revisit project design criteria to incorporate dissemination outputs, so that the present situation of an accumulation of potentially useful, but inaccessible technologies is overcome? This paper argues for the production of dissemination materials, which are easily understood and accessible to target audiences as an integral part of research projects, in addition to academic research reports. The following section gives recommendations based on our experiences in packaging technologies for the Linking project.

Recommendations and Conclusions

The main goal of undertaking "research for development" is to make relevant technologies available to smallholder farming families. There is a need for location and user-specific dissemination materials that vary according to the needs and characteristics of target audiences. Therefore it is of great importance to distinguish between different target audiences before producing dissemination materials.

It is recommended that donors encourage researchers to undertake research that has practical outcomes that are relevant to the circumstances of users, and to effectively communicate the findings as a component of that research. Researchers should aim to produce outputs that are packaged for (often in collaboration with) extension service providers and smallholder farmers, instead of only for Programme managers, donors and academics. The research teams (perhaps including dissemination specialists) would need to address research presentation and format. This would require a change in the culture of research that rewards academic presentation above practical solutions to poverty.

This recommendation has implications for budgets, project design, research team skills and "research for development" partnerships. This paper has highlighted the difficulties encountered in hiring a different set of people to package technologies to that which conducted the research. Such a separation of purpose is inefficient in its use of resources.

A dissemination strategy should be included in the design of the project and should highlight issues such as the following (adapted from WEDC in Gundel *et al*, 2001):
• Who are the anticipated users of the outputs of the project?
• What information do these users need?

- Do the target audience have resources to receive and use the information effectively?
- What is the most appropriate and effective format and dissemination method?
- Is the content comprehensible to users and written in a language they can understand?

Funding institutions should:
- Give priority to dissemination to maximise the impact of research
- Allow a realistic timeframe for dissemination within a project
- Motivate researchers to disseminate widely

The results of research should be easily accessible on the Internet, with links to all documented materials. It should not be necessary for those requiring further information to have to write to the project leader or Programme manager.

This paper has highlighted the need to develop and implement mechanisms to make research outputs accessible to intermediate and end users. The commonly used technical reports are clearly not an effective way of disseminating research findings and technologies to extension service providers or farmers. The Linking project found access to research reports difficult, extracting practical information is time consuming and in some cases impossible.

It is therefore recommended that funding institutions provide additional project resources to cover the costs of providing fact sheet type dissemination outputs that can be used as a basis for the development of extension materials, so that this function can be carried out effectively during the project's life cycle and beyond. A dissemination strategy should be included in the research design stating clearly the target audiences and their information needs.

Acknowledgements

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