

Node: Suite Summary^{1,2}

Ghana: Improved decision-making in NR research

Context

In the forest agriculture interface (FAI) of Ghana, considerable research has been undertaken to address problems of soil fertility, caused partly through shortened bush fallow rotations. Much of this research has yielded technical solutions that have been successful in increasing yields. However, the outputs of this research have often not been taken up by farmers.

This limited uptake and adoption of technologies can be attributed, at least in part, to inadequate attention having been paid to promotion pathways and dissemination. In addition, the characteristics of the technologies themselves should be considered as possible factors influencing uptake. In the light of these considerations, in 1999, NRSP issued a call for proposals addressing the 'knowledge gap between technology design and dissemination'.

Three projects have formed the basis of this Node: suite. They have addressed the following research topics.

Research Topics

- What are the reasons for the low adoption of soil fertility research outputs?
- Under what circumstances will the utilisation of new research-based knowledge about particular technologies be most likely to occur?
- Is it possible to develop effective dissemination strategies for soils research outputs in Ghana, in order to produce higher adoption rates for soils technologies?
- Is it possible to develop a conceptual framework and methodology that can highlight those aspects of a new technology that will make it more likely to be adopted by specific groups of the poor in the forest agriculture interface (FAI)?

Projects

Three projects were undertaken in this Suite (see below for project links). These were:

- R7560: Review of technologies being evaluated in the forest agriculture interface (Feb 2000 - March 2001).
- R7516: Bridging knowledge gaps between soils research and dissemination in Ghana (January 2000 – Feb 2001).
- R7515: Knowledge dissemination domains in the forest agriculture interface (March 2000 – Feb 2002).

In addition, a study, PD134, was commissioned during 2004 in order to track the uptake of the products produced by R7515 and R7516.

¹ This document summarises NRSP's work in one of its Uptake Promotion Node: suites. For further details and links to project and project documents see <http://www.nrsp.org.uk/6.aspx>

² This document presents research funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

Project R7560 aimed to develop an enhanced understanding of the biophysical and socio-economic conditions required for effective stabilisation of the soil and vegetation resources of the FAI. A detailed analysis was undertaken of the ability of different technologies to address two key production constraints: poor soil fertility and weed encroachment. A second parallel analysis investigated socio-economic constraints to the adoption of the technologies by farmers. Research activities consisted of visits to Nepal and Ghana to meet with researchers involved in research on FAI-related issues and review of published international literature and other sources collected during the country visits.

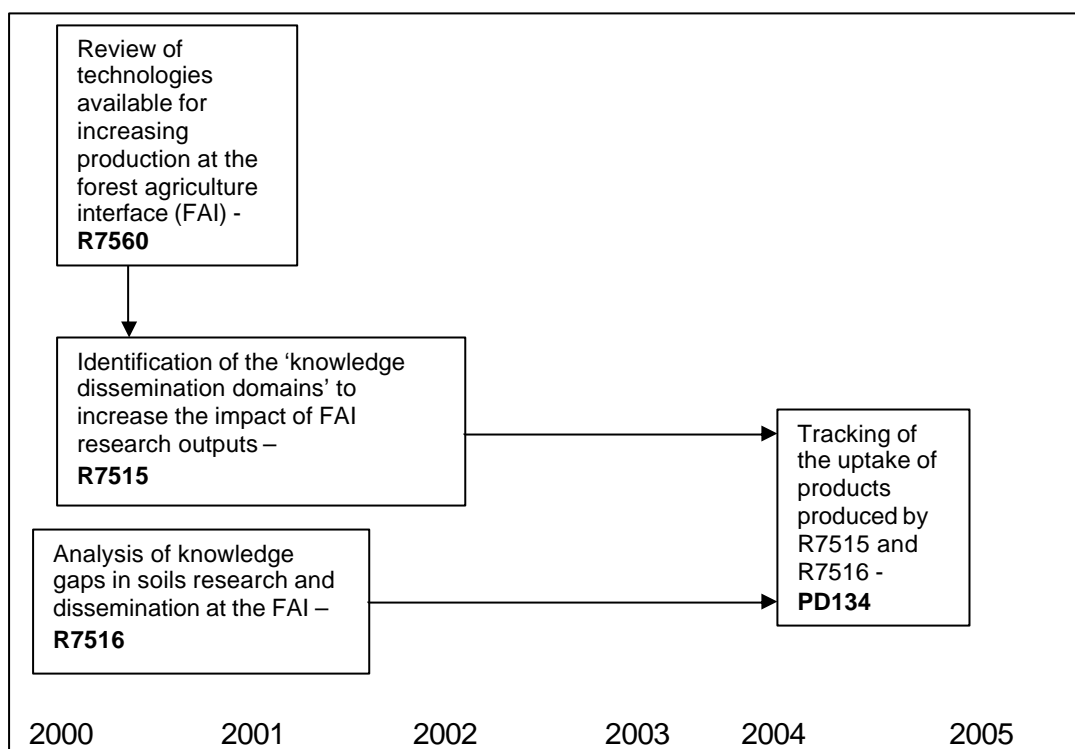
The purpose of R7516 was to develop and promote 'strategies to secure the livelihoods of poor people dependent on agricultural systems near the receding forest margin'. It aimed to do this through the achievement of three outputs: first, the collation and dissemination of information on the success and failure in adoption of soil fertility research outputs; second, the documentation of reasons for the low adoption of soil fertility research outputs; and third, the development a framework for designing soil fertility research and dissemination strategies.

In addition to a literature review, research involved fieldwork over nine months in five Ghanaian sites: two in the Brong Ahafo region, two in the Ashanti region and one in the Western region. Data on livelihoods and local knowledge, collected during fieldwork, was analysed using the Agroecological Knowledge Toolkit (AKT), which was developed by the project. Drawing on lessons learnt from the fieldwork phase of the project, a set of tools was produced to enable researchers to better link their research and dissemination activities to rural livelihoods. Lastly, four workshops were held within Ghana to assist with the dissemination of the tools to the Ministry of Agriculture, research institutes and DFID.

R7515 sought to 'decrease the knowledge gap between technology design and dissemination to assure greater impact of research outputs'. This was to be achieved through two outputs: a review and synthesis of conceptual issues and practical methods relating to the factors influencing the potential use of innovations; and an analytical framework and methodology for identifying the 'knowledge dissemination domain' of proposed FAI research outputs. This was the electronically based decision support tool, 'interface'

This project did not undertake fieldwork. Instead the framework and methodology were developed using secondary sources and tested during workshops in the UK and Ghana.

Project links within Ghana Suite 3: 2000 - 2005



Outputs

Findings

The most significant finding regarding constraints to the uptake of soil fertility technologies is that there has been a lack of a systematic consideration of farmers' circumstances, needs and priorities in the development of soils technologies. All of the projects point to the diversity of farmers' circumstances and, importantly, to the finding that for many people farming is only one part of a broader set of livelihood strategies. Many of the technologies developed were only appropriate to those farmers with a relatively high level of resource endowment, particularly those concentrating on the production of high value cash crops. One key impact of this narrow focus was the exclusion of female farmers, whose access to resources tends to be most deficient constraint.

A fundamental consequence of the limited attention to the differing circumstances and priorities of different farmers is a severe lack of technologies that are:

1. Directly relevant to poorer farmers' circumstances and priorities.
2. Able to produce significant observable benefits.
3. Economically attractive to poorer farmers.
4. Compatible with other economic activities or with broader livelihood strategies.

These factors explain the low levels of technology uptake by poorer farmers.

R7516 identifies the institutional constraints preventing a better dialogue between researchers and farmers. These include the fact that the national agricultural extension system is overly reliant on external sources of funding, that district level representatives of the Ministry of Food and Agriculture (MOFA) are not active in seeking out the results of research and are not

targeted by researchers, and that extension agents are more used to delivering packaged technologies than those that make use of farmers' existing knowledge.

R7560 reviewed several techniques that have been identified as possible technical solutions to declining productivity at the FAI. These included alley-cropping, biomass transfer, cover crops, multipurpose tree species, animal manure, *Tithonia diversifolia*, improved and enriched fallows, and legume intercrops. The review suggested that many of the techniques may, in themselves, be insufficient to prevent the decline in productivity experienced when the land is cleared of secondary vegetation. This project indicated that the techniques promoted often do not provide sufficient benefit when used within the land, labour and capital constraints that face most resource-poor farmers.

Farmers may also discount the value of future benefits derived from using specific techniques because factors such as insecure land tenure discourage planning and investing for the long-term. This further constrains adoption of technologies for land improvement.

The relevance of different NR technologies and techniques can be increased by identifying and addressing resource problems at the FAI through a participatory process that enables a greater understanding of the priorities and needs of farmers.

Research messages

- Low adoption of soils fertility research technologies is due to a mismatch between the technology options being made available and the circumstances, needs and priorities of the poorest farmers.
- Research and extension services are often not well equipped in terms of both skills and resources, to address farmers' circumstances.
- Increasing the participation of farmers in the design of soil management techniques could make these technologies/practices more appropriate to farmers with diverse sets of resource endowments.

Key research products

- A web-based searchable database containing biophysical and input requirements for different technologies (R7560).
- A review and synthesis of conceptual issues and practical methods for agricultural research and innovation: Reece, D. and Sumberg, J. 2003. 'More clients, less resources: towards a conceptual framework for agricultural research in marginal areas'. *Technovation*, 23, pp. 409-421 (R7515).
- An analytical framework and methodology for identifying the 'knowledge dissemination domain' of FAI research outputs (Decision support tool: Interface) (R7515).
- An understanding of the reasons for the low adoption of soil fertility management technologies: Moss, C. 2001. Bridging knowledge gaps between soils research and dissemination in Ghana: a study of cover crop knowledge storage and information flow (R7516).
- A suite of tools for linking agricultural research and dissemination to rural livelihoods (Agroecological knowledge toolkit, AKT): Moss, C. et al. 2001. Local knowledge and livelihoods: tools for soils research and dissemination in Ghana (R7516).

Final technical reports

- Matthews, R.B. 2001. Review of technologies being evaluated for the forest agriculture interface. Final Technical Report of project R7560. Silsoe: Cranfield University.
- Sinclair, F. 2001. Bridging knowledge gaps between soils research and dissemination in Ghana. Final Technical Report for project R7516. Bangor: School of Agricultural and Forest Sciences, University of Wales.
- Sumberg, J. 2002. Knowledge dissemination domains in the forest agriculture interface. Final Technical Report for project R7515. Norwich: Overseas Development Group, University of East Anglia.
- Crewe, E. & King, R. 2004. Tracking study of R7515 and R7516 products - use of knowledge in the forest agriculture interface in Ghana. Programme Development Report for PD134.

Impacts

In 2004 a tracking study, PD134, was commissioned to ascertain the uptake of the two computer based products from R7515 and R7516. These are the decision support tool (Interface) developed by R7515 and the Agroecological knowledge toolkit (AKT) developed by R7516. Both of these products had been demonstrated at workshops within Ghana prior to the completion of the projects. They were designed to improve understanding of the multiple livelihood strategies of technology users, their knowledge, and the need to involve them in technology research and development in more appropriate ways.

The Interface decision support tool was demonstrated at a workshop at the Crops Research Institute in Kumasi. Eighteen people, the majority of whom were from Ghanaian research institutions, attended this workshop. The tracking study discovered that the majority of these were not using the tools three years later. This is explained partly by a division between social and natural scientists: the social scientists did not find the concepts novel and were reluctant to use the Interface CD; the natural scientists tended to view the content of the CD Rom as in the domain of social science and thus not directly relevant to their work.

The AKT toolkit was demonstrated at four workshops to a total of 52 people from the Ministry of Agriculture, research institutes and DFID. The tracking study found a similar lack of use for this product, although workshop participants were interested in the ideas conveyed by them. Again, lack of relevance to their own work was put forward as a key reason by natural scientists.

For both projects, technology problems, lack of relevance, inadequate training on the products and individual rather than institutional learning were considered to be the main explanations for the limited use of the products.

Further work

The information gathered by these projects produced useful insights concerning the relationship between users and researchers during the innovation process. However, individuals hold most of this information. Any future work should concentrate on institutionalising ownership and use of this information within Ghana.