Scaling-up strategies for research in natural resources management

A comparative review

Sabine Gündel, Jim Hancock and Simon Anderson

The Natural Resources Institute (NRI) of the University of Greenwich is an internationally recognized centre of expertise in research and consultancy in the environment and natural resources sector. The Institute carries out research and development and training to promote efficient management and use of renewable natural resources in support of sustainable livelihoods.

This publication is an output from NRSP research project R7865 funded by the UK Department for International Development (DFID) for the benefit of developing countries. However, the views expressed are those of the authors and not necessarily those of DFID.

Price £7.50

Copies of this book can be obtained by writing to NRI Catalogue Services, CAB International, WALLINGFORD, Oxon OX10 8DE, UK. When ordering, please quote **ECN17**.

Natural Resources Institute
ISBN: 0 85954 538 5

University of Greenwich, a charity and company limited by guarantee, registered in England (Reg. No. 986729).
Registered Office: Old Royal Naval College, Park Road, Greenwich, London SE10 9LS.

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Acknowledgements

We would like to thank all the participants of the Whitstable workshop as well as the particıpants of the electronic discussion platform for their valuable inputs and feedback. This document is based on the richness of their experiences.

Adam Behrendt, Teeka Bhattarai, Will Critchley, Jim Ellis-Jones, Steven Franzel, Julian Gonsalves, Larry Harrington, Bashir Jama, Susan Kaaria, Katrin Linzer,Tabita Middleton, Dan Miiro, Diego Pacheco, Margaret Quin, Pablo Sidersky, Michael Stocking, Moses Tenywa, Georg Weber and Jean Marc von der Weid.

We would also like to thank the peer reviewers Elizabeth Robinson and Barry Pound for their positive criticisms.

Executive Summary

This review, commissioned by the Department for International Development (DFID) Natural Resources Systems Programme (NRSP) Hillsides Research, had as its objective the identification of appropriate strategies to accelerate uptake of innovations by target farmers, and to provide a framework to guide the formulation of scaling-up mechanisms for these innovations towards the aim of poverty reduction and improvement of livelihoods. The review methodology consisted of key literature consultation, an electronic discussion, a mid-term workshop with various stakeholders (e.g. researchers, NGOs) from Asia, Africa, Latin America and Europe and a detailed case study analysis.

It was decided to adopt the terms 'horizontal' and 'vertical' scaling-up as discussed and defined during the 'Going to Scale Workshop' (IIRR, 2000). *Horizontal scaling-up* is the geographical spread to more people and communities within the same sector or stakeholder group, commonly referred to as dissemination. Others refer to it as a scaling-out process across geographical boundaries. *Vertical scaling-up* is institutional in nature and involves expansion to other sectors/stakeholder groups, from grassroots organizations to policy-makers, donors, development institutions and international investors.

Furthermore the review is based on the following overarching definition of the objective of scaling-up:

> "more quality benefits to more people over a wider geographical area more quickly, more equitably and more lastingly" (IIRR, 2000).

This definition stresses the importance of a *people-centred* vision to scaling-up. Furthermore it introduces the *quality dimension* to the definition without neglecting the *quantitative dimension* and it highlights the importance of *time*, *equity* and *sustainability*, dimensions which are of particular importance in the natural resources management (NRM) context.

Few cases of successful scaling-up were encountered in relation to research, where creating impact has largely resided with the development of traditional uptake material at the end of projects, without taking into account the dimensions mentioned above.

The majority of research cases took a narrow perspective to scaling-up and emphasized the existence of knowledge and technologies. They saw the challenge in improving the ways to "get these technologies out" to the target groups over a wider geographical area (horizontal scaling-up). Many of the development-oriented cases acknowledged the multidimensional nature and complexity of scaling-up, and stressed the importance of institutional processes and learning and the need to include a range of stakeholders from different sectors.

However, these perceptions should not be seen in isolation and it is important to acknowledge that the transfer and adaptation of existing knowledge, as well as the creation of new knowledge, is important in NRM research.

Agreement exists that scaling-up is about creating sustained poverty alleviation and increasing local capacity for innovation on larger scales. The review and case studies showed that there are no simple rules to achieving scaling-up. Attempts focus either on geographical and quantitative dimensions of scaling-up, or on institutional processes. These two are not mutually independent pathways, but synergistic and overlapping. A key finding is that research has to be integrated within wider pro-poor development processes.

While no blueprint methods for scaling-up can be found, the report concludes from case studies and wider experiences that creating an impact from research results has in the past focused heavily on the 'post-project' stage, but many of the key strategies which have been identified as prerequisites for successful scaling-up need to be addressed more extensively in the pre-project and implementation phases.

As a response to this major shortcoming, the strategic review framework developed places its main emphasis on the preparatory and implementation stages of research. Many of the elements are not within traditional research activities, and are often related to good development practice, but nevertheless have a direct bearing on success in scaling-up research.

These are:

- engaging in policy dialogue on pro-poor development agendas and during the project to demonstrate project successes in terms of pro-poor impact
- identifying target groups and local, institutional and environmental enabling and constraining factors to scaling-up
- identifying appropriate research objectives and outputs within development processes to ensure widespread uptake
- building networks and partnerships to increase local ownership and pathways to scaling-up
- raising awareness of the merits of the approaches taken among different stakeholders, including the wider target group and policy-makers
- building capacity and institutional systems to sustain and replicate
- developing appropriate funding mechanisms to sustain capacity for expansion and replication
- identifying indicators and planning, monitoring and evaluation methods to measure the scaling-up impact and process.

A major implication for research programmes is that NRM research has to take place in the context of local and national development processes in order to be able to respond to local demand.

- Project calls have to be addressed towards institutions and organizations in the target regions to strengthen the implementation of a demand-led approach.
- Shifting the emphasis of research to partners in developing countries may require the development of regional capacities in demand-led approaches, sustainable livelihoods and scaling-up, and development of partnerships, and innovative means to fund, monitor and evaluate these strategies.

The implications for researchers and their institutions are:

- the establishment of functioning partnerships with in-country agencies, particularly working within participatory development processes and producing outputs suitable for dissemination in local and regional situations
- furthermore researchers and their institutions have to become accountable for their contribution to scaling-up, which in turn requires the identification of indicators to show research effectiveness in terms of impact.

Potential research contributions to current knowledge gaps that should be addressed were identified:

- monitoring and evaluation indicators and approaches for scaling-up, including pro-poor targeting and determining cost-effectiveness of scaling-up
- how to develop appropriate partnerships; mechanisms for policy dialogue and channels for communicating effectively with target groups
- learning from other sectors and encouraging a cross-sectoral systematization initiative for scaling-up.

1 Setting the scene

1.1 REVIEW BACKGROUND

This document is an output of a UK-based review which was commissioned by the Natural Resources Systems Programme (NRSP) of the UK Department for International Development (DFID); NRSP is one of DFID's research programmes with the following aim:

"NRSP aims to deliver new knowledge that can enable poor people, who are largely dependent on natural resources, to improve their livelihoods. Research focuses on the improvement of the management of land covering soil, water, vegetation and organic residues in an integrated way. It aims to find strategies for natural resources management (NRM) that can enable the poor to build their livelihoods and make a sustainable move out of poverty. The new knowledge that the programme generates is of varying types. It includes specific technologies for land care, better strategies for NRM and better methods for transferring the knowledge of these strategies to various clients ranging from poor individuals, households and communities to policy-makers that are influential in various natural resource sectors" (NRSP, 2000).

The NRSP has largely contributed in the past to the development of technological innovations focusing on soil and water conservation measures in hillside production systems with particular emphasis on resource-poor farmers in fragile environments.

In order to make a significant contribution to poverty reduction and the improvement of livelihoods, the use of these technologies by target farmers has to be accelerated and scaled-up, an aspect that has conventionally been treated in isolation from the research process itself. At the 1999 hillsides conference (Ellis-Jones *et al.*, 1999), principal investigators of the NRSP and other donor-funded hillside projects concluded that there is a recognized need for more innovative and demand-driven scaling-up strategies to accelerate the impact of research.

A key criticism, from a livelihoods perspective, of the conventional approach to technology dissemination (transfer-of-technology) is its failure to reach the poor. Success has often been restricted to 'Green Revolution technologies' that best fit the needs of better-off and resource-privileged farmers (Conway, 1997). Technologies have also often failed to address gender-specific needs, usually ignoring the involvement of women. Where interventions have been successful and sustainable, poverty alleviation has generally been restricted to relatively small numbers of farmers.

1.2 OBJECTIVES AND OUTPUTS

This review is aimed at the identification of improved scaling-up strategies for NRM assuming that the adoption of the improved strategies will reduce the time-lag between technology development and its uptake. This in turn will increase the availability of technology options and lead to more efficient use of existing natural resources to the benefit of the poor.

The guiding question for this review is: how can research experiences in NRM be scaled-up to make a significant contribution to poverty

alleviation and the improvement of livelihoods? The review consists of the following elements:

- a synthesis of lessons from current and completed research and development experiences from within NRSP target countries and other relevant countries (literature review and electronic discussion)
- engagement of key stakeholders in a consultation process that captures different perspectives and experiences in the identification of successful scaling-up strategies (workshop, electronic discussion)
- development of a strategic framework to assist ongoing and future research initiatives to identify the most appropriate scaling-up strategies for research outputs (workshop and review)
- discussion and recommendations regarding the application of the framework in the research context (workshop and review).

1.3 STRUCTURE OF THE REVIEW AND HOW TO APPROACH IT

Section 1 of the review provides an overview of the importance of scaling-up on the agenda of international and national (i.e. DFID) development and research organizations. It also provides a definition of scaling-up and looks at the links between scaling-up and research.

Section 2 presents lessons learned from case studies from NRSP target countries and elsewhere, drawing on experiences from the development and research context. Strategic elements for scaling-up are identified and successes and weaknesses are highlighted.

Section 3 is based on the findings of the previous sections and systematizes the strategic elements by developing a framework for scaling-up.

Section 4 discusses the implications of adopting the framework in a research context and provides recommendations for NRSP and researchers.

In order to appreciate the key findings of the review, the reader should not only focus on Section 4, but also on the key issues distilled from the information provided in Sections 1 and 2. These are presented at the end of the respective sections. Furthermore it is important to understand the structure and content of the framework developed in Section 3.2 to fully appreciate the conclusions and recommendations suggested in Section 4.

1.4 REVIEW METHODOLOGY

1.4.1 Literature review

The literature review was based on an internet search which also included documents from other sectors such as health and education where the scaling-up discussion is a key to institutional reforms.

We also reviewed DFID's position on research and a range of ongoing initiatives of other programmes within DFID's research portfolio, as well as the project memoranda from current NRSP projects. Other entry points were the two international Consultative Group on International Agricultural Research (CGIAR)–NGO Committee workshops in Washington (1999) and in the Philippines (2000), both reported in IIRR (2000), which brought together researchers and development practitioners to discuss scaling-up and the impact of agriculture and NRM interventions. The proceedings of these workshops provided interesting case studies as well as key resource persons to be included in the electronic discussion and the Whitstable workshop (2001).

Other workshops organized by the International Centre for Research in Agroforestry (ICRAF) on integrated natural resource management (INRM) and scaling-up formed key documents for the review.

Although our main focus was on scaling-up experiences of research results, we soon realized that most of the scaling-up discussions and resulting documentation focused on development interventions and this is reflected in the references used for this review.

1.4.2 Electronic discussion platform

An electronic discussion platform was established at an early phase of the review. The participants were identified based on a series of criteria. It was intended to engage stakeholders from different institutional backgrounds, e.g. national agricultural research systems (NARS), CGIAR, NGOs, universities, etc., as well as from different geographical regions covering the NRSP hillside target countries. As mentioned above, key persons were identified from the participants lists of the CGIAR–NGO Committee workshops, INRM workshops, and other sources. In total, 38 people joined the electronic discussion platform. The aim of this discussion was to share findings from an early stage and to make people aware of the existence of the review. The initial active participation in the electronic discussion decreased over time due to the length of the process (6 months). Retrospectively it would have been better to engage stakeholders at a later stage where more information could be readily shared. On the other hand, the early engagement with different stakeholders led to the identification of important case study material and documentation.

1.4.3 Mid-term workshop

The 3-day Whitstable workshop was designed and facilitated by the Natural Resources Institute (NRI), with participants from relevant projects in Nepal, Uganda, Bolivia, Colombia, UK and the Philippines (Gündel and Hancock, 2001).

During the workshop, participants discussed the importance of a strategic framework for scaling-up and identified important elements of such a framework. The mix of participants from North and South, and academic and development backgrounds, helped to bring out key issues, which contributed significantly to the discussion. The elements and issues identified at the workshop form the backbone of much of the present document. The workshop in particular shaped the framework for analysis in terms of:

- looking at the project phases/design process
- taking in the wider development context.

1.4.4 Analysis of selected case studies

Another important input for the development of a scaling-up framework derived from the analysis of a range of case study experiences. Lessons were drawn from three different sets of case study material, which were originally presented and discussed at the Whitstable workshop (Gündel and Hancock, 2001). The NRSP project memoranda were used to identify proposed scaling-up strategies, a SWOT analysis of different project case studies from NRSP hillside target countries was undertaken to identify strategic elements and their application, and an analysis of wider experiences deriving mainly from international workshops led to the identification of the proposed scaling-up strategies.

1.5 SCALING-UP IN GLOBAL RESEARCH AND DEVELOPMENT AGENDAS

Arguments for scaling-up are readily available as practitioners, policy-makers, researchers and funding agencies would agree that there is a substantial body of knowledge available, but often produced in a narrow academic context where it has not been communicated widely. On the other hand, in an environment of scarce resources, funding agencies, researchers, NGOs, extension services and policy-makers are coming under increasing pressure to demonstrate impact of their research projects.

Box 1 Stakeholders concerned with scaling-up

- All major donors (limited resources, "ambitious targets")
- Research organizations (NRM research has accountability problem, limited funds)
- NGOs ("small is beautiful" no longer attracts donors)
- Extension services
- Policy-makers (national and global)

The scale of the challenge for showing the impact of research is illustrated by the estimate that about US$4 billion has been spent on agricultural research in Africa over the last 20 years. Agricultural productivity in the same period has been stable or often has decreased (McCalla in Gura and Kreis, 2000).

The importance of increased impact of research and development programmes has been recognized by international and national fora. There are many examples for this and include the recent CGIAR–NGO Committee workshops on scaling-up at international level and the current high priority of dissemination and uptake studies in DFID's research programmes at UK level.

On an international level, the need for scaling-up the results of successful small-scale projects and innovations in NRM has been expressed through various analyses and workshops. Much of this started with reflections on how NGOs could move from their participatory development approaches, often at village level, to achieving a replicable impact on a larger geographical scale (Edwards and Hulme, 1992). This was in the light of increased scepticism by donors and governments of the rhetoric and often process-oriented nature of NGO work, a challenge that is continually being addressed (Edwards and Hulme, 1998; Uvin *et al.*, 2000). Past and ongoing work looks at the related aspect of institutionalizing participation in agriculture and NRM (Scoones and Thompson, 1994; IIED, 2000).

More recently there has been a growing recognition that the complex innovations arising out of NRM research have not achieved widespread impact through conventional dissemination approaches. The Global Forum for Agricultural Research (GFAR) and NARS (national agricultural research systems) Secretariat have supported the CGIAR–NGO Committee to identify cases and strategies for scaling-up, recognizing the need for wider impact (GFAR, 1999, 2000). Greater impact can be achieved through new innovative partnerships, in many cases in recognition of the important work done by NGOs in sustainable agriculture, for example.

The above emphasis has resulted in a series of workshops, held in Washington and at the International Institute for Rural Reconstruction (IIRR) in the Philippines, where scaling-up was analysed through conceptual discussions and case studies, many of which included NGO experiences (IIRR, 2000). These identified the need for major investment in strategic research in scaling-up of sustainable agriculture and NRM, but had an unresolved debate on whether this should be carried out more upstream or downstream (along the research–development continuum).

The United Nations Development Programme (UNDP)-funded Sustainable Agriculture Networking and Extension (SANE, n.d.) has identified some major challenges for scaling-up NGO sustainable agriculture initiatives (see Box 2).

Under the CGIAR, ICRAF has created a development division with an explicit mandate to accelerate the impact of its work, to increase the

Box 2 Challenges to scaling-up agro-ecological NGO initiatives

- Local projects suffer from 'programme placement' (most promising locations) and 'self-selection' (most qualified staff) biases. It makes replication and impact assessment very difficult.
- NGOs suffer bureaucratization in scaling-up, so how can they decentralize management?
- Local projects are often implicitly or explicitly subsidized. How to justify continued subsidies, and assess full costs? Macro and institutional contexts are unfavourable. The pilot case is not generally applicable, as, for example, it only addresses niche markets.
- Solutions are too focused on technological solutions.
- Charismatic leadership is important, but needs to be properly recognized and built more widely.
- With small projects, collaborative arrangements on a personal basis with researchers or government are possible. With scaling-up this needs more formalization and resources. Also on a larger scale such relationships may become more politicized.

Source: SANE (n.d.).

speed and scale of adoption in order to reach 80 million people over next 10 years (Cooper and Denning, 2000). Among other characteristics, the CGIAR workshop on INRM decided that research must be amenable to scaling-up (CGIAR, 2000).

There are also examples of other efforts to address scaling-up in related sectors of development: upgrading urban communities (Imperato and Ruster, 1999), increasing child survival (Rasmusson *et al.*, 1998), as well as spreading education innovations in the USA (King, 1998) and improving the broader private sectors in Sweden (Malvicini and Jackson, 2000).

Unfortunately, these discourses often remain compartmentalized with little or no acknowledgement, cross-referencing, cross-fertilization or exchange (Oudenhoven and Wazir, n.d.).

1.6 SCALING-UP DEFINITION AND SCOPE

Uvin and Miller (n.d.) pointed out "that the literature of scaling-up is reminiscent of the Loch Ness Monster. It has been sighted enough to make even the most sceptical give it a measure of respectability; and its description is as varied as the people who have written about it." They further suggest that this variety is important as it allows for an analysis from a range of perspectives. The authors developed a typology of scaling-up (Table 1).

However, within the scope of the research discussion, it is sufficient to use two main typologies which cover the process of dissemination and uptake on the one hand and the multiple-stakeholder involvement and institutional processes on the other.

We, therefore, decided to adopt the terms 'horizontal' and 'vertical' scaling-up as discussed and defined during the 'Going to Scale Workshop' (IIRR, 2000) for the present review.

- Vertical scaling-up is expansion higher up the ladder. It is institutional in nature and involves other sectors/stakeholder groups – from grassroots organizations to policy-makers, donors, development institutions and international investors.
- Horizontal scaling-up is the geographical spread and expansion to more people and communities within the same sector or

Table 1 Typology of scaling-up

Type	Description	Alternative terms*
Quantitative scaling-up	'growth' or 'expansion' in their basic meaning; increase the number of people involved through replications of activities, interventions and experiences	dissemination, replication, 'scaling-out' or 'horizontal scaling-up'
Functional scaling-up	projects and programmes expand the types of activities (e.g. from agricultural intervention to health, credit, training, etc.)	'vertical scaling-up'
Political scaling-up	projects/programmes move beyond service delivery and towards change in structural/institutional changes	'vertical scaling-up'
Organizational scaling-up	organizations improve their efficiency and effectiveness to allow for growth and sustainability of interventions, achieved through increased financial resources, staff training, networking, etc.	'institutional development'

*Adopted in Gündel and Hancock (2001).

stakeholder group. Others refer to it as a scaling-out process across geographical boundaries. Achieving geographical spread is also realized through scaling-down – increasing participation by decentralization of accountabilities and responsibilities (breaking down large programmes into smaller programmes/projects).

These definitions are not free of ambiguity. In the literature there is a degree of controversy regarding the terminology and concepts around scaling-up which became obvious during the 'Going to Scale Workshop' and during the electronic discussion (IIRR, 2000). Whereas some people use 'scaling-up' as a synonym for dissemination, others understand it as the impact a specific intervention might have at a higher scale.

Scaling-up is understood to be the process of assessing and managing those (positive or negative) externalities, or unexpected complexities or unintended consequences, that emerge at higher scales of analysis from a widespread process of 'scaling-out' (Harrington, personal communication).

Lobo (1995) points out that the processes of horizontal and vertical scaling-up have to be linked in order to achieve sustainable impact. He argues as follows:

> "Up-scaling individual success stories to a larger scale calls for a perspective of macro-management which at the same time has to be rooted in and be responsive to the micro-level. Unless there is a continuous and enabling co-operation between the key sectors and actors such a process would be bound to get unstuck, thus seriously jeopardizing sustainability as well as replicability" (Lobo, 1995).

The vision established during the CGIAR–NGO Committee workshop on what scaling-up should lead to provides important additional elements for our definition –

- **More quality benefits to more people over a wider geographical area more quickly, more equitably and more lastingly.**

This definition stresses the importance of a *people-centred* vision to scaling-up. Furthermore it introduces the *quality dimension* to the definition without neglecting the *quantitative dimension* and it highlights the importance of *time, equity* and *sustainability*, dimensions which are of particular importance in the NRM context. Figure 1 summarizes some of these dimensions and approaches to scaling-up and was presented at the Whitstable workshop (Gündel and Hancock, 2001).

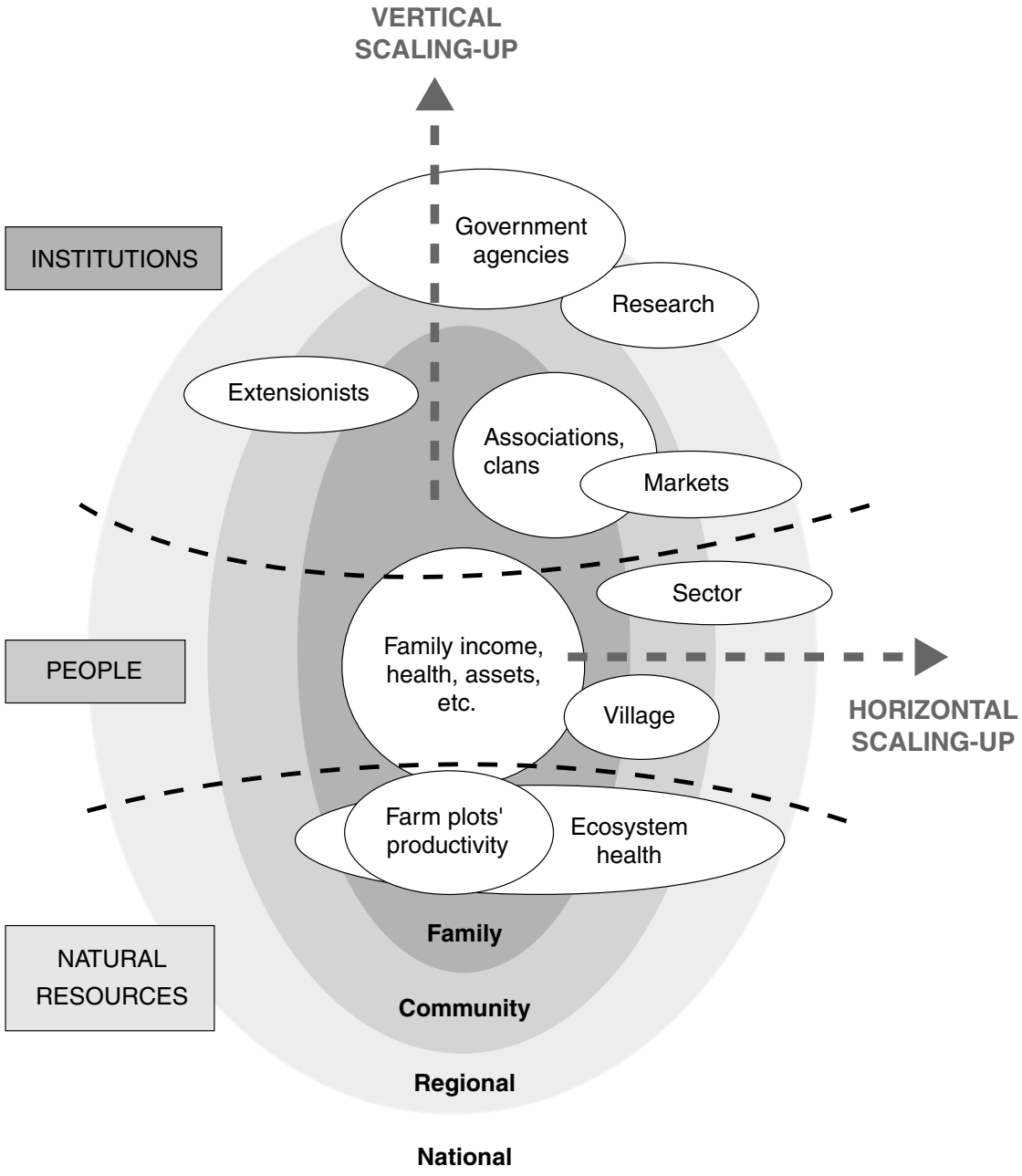

Figure 1 Scales of impact and processes of scaling-up (adapted from IIRR, 2000). Large concentric circles show increasing scales and levels. Bubbles show examples of aspects considered at different scales and under different processes of scaling-up.

The figure attempts to demonstrate the different scales on which research projects and outputs have a potential impact. These range from family level impact to an impact on a national scale, although it could also reach a global scale if NRM research was to be very ambitious in terms of showing impact. For the type of NRM research looked at in this review, however, we feel that reaching impact on a national scale is already a sufficiently ambitious target.

Furthermore, Figure 1 illustrates the different components to consider, i.e. 'natural resources', the 'people' and 'institutions'. Again, these have to be specified for different scales, for example, there are certain NRM resources 'on-farm', at community level (shared resources), at regional level, etc. 'People' can refer to individuals, families, or family groups, etc., and similarly institutions can range from local associations and clans to governmental agencies.

Figure 1 also shows how the different processes of scaling-up lead to quantitative or qualitative changes. As stated previously horizontal scaling-up is about involving more people at a certain scale, whereas vertical scaling-up is about involving different stakeholders across different scales.

1.7 THE ROLE OF RESEARCH IN SCALING-UP

In order to understand the role research can play in horizontal and vertical scaling-up, we have to briefly look at the different research approaches. In simple terms, research can either be 'supply-driven' or 'demand-led'. The former clearly distinguishes between the source of innovation as one entity and the user or beneficiaries as a separate entity whereas the latter does not draw this distinction.

Figure 2 shows the conventional approach of supply-driven knowledge generation and diffusion (Max Lock Centre, 1998).

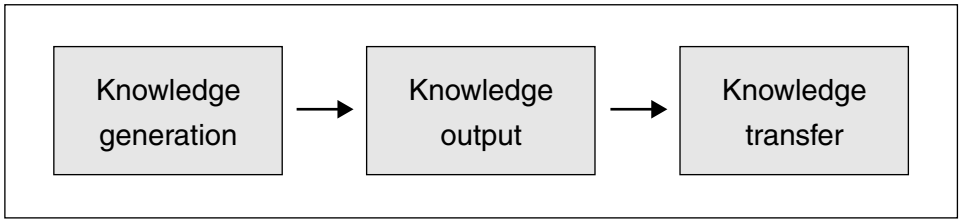

Figure 2 Supply-driven knowledge generation and diffusion.

Box 3 Characteristics of supply-driven and demand-led research

Supply-driven research can be characterized:

- users or beneficiaries are assumed to be unable to generate the required change or innovation by themselves
- the source of innovation has the capacity to recognize and prioritize the needs of the recipient
- the product or innovation is expected to satisfy the needs of the recipients
- there is an underlying assumption of a homogeneous target group.

Demand-led research can be characterized:

- the source of innovation and the users are not seen as separate entities
- local knowledge and practices form an input into innovation development
- mutual learning and problem solving are at the centre of the innovation process
- the target group is able to assess needs and priorities under heterogeneous conditions.

Source: adapted from Oudenhoven and Wazir (n.d.).

Figure 3 illustrates an interactive approach to research and dissemination which is based on the demands of the target groups.

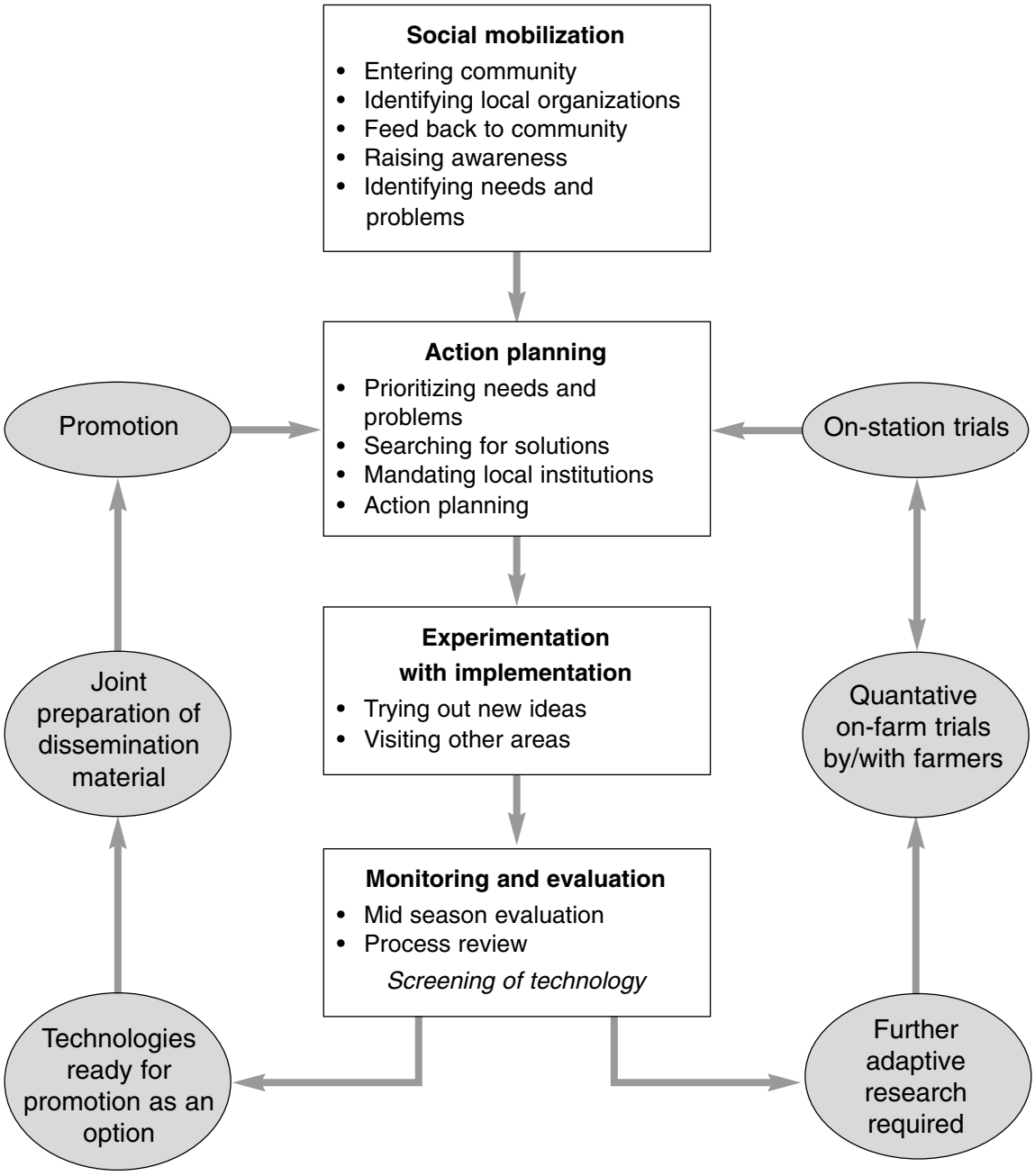

Figure 3 Demand-driven research and extension processes (Hagmann *et al.*, 1998).

Saywell and Cotton (2000) in their literature review concluded that "it is recognized that the linear, unidirectional model of information flow lacks credibility".

Interactivity, feedback and the central position of users in dissemination need to be stressed, especially in complex and diverse situations (Schmidt *et al.,* 1997).

Martin and Sherington (1997) pointed out that "approaches involving technology-user assessments, on-farm trials and farmer participation changed the model of technology

development from a linear transfer of technology model to an iterative approach based on learning and modification." But there is a danger that "participation is becoming simplistic, and more radical implications undermined by donors and government institutions."

Biggs (1989) developed a categorization of research approaches in which he distinguishes a continuum of contractual (supply-led), consultative, collaborative and collegiate research (demand-driven). Different research types produce different outputs which are of interest or relevance to different categories of users, which in turn implies that different scaling-up strategies are required to promote the outputs.

This was also concluded from the participants of the hillside conference (Ellis-Jones *et al.*, 1999), who identified different processes contributing to the increased impact of research, which they classified as either supply-led processes undertaken by those who conduct or commission the research, and demand-led processes undertaken by those who use the outputs of research. They also classified different types of research outputs, which are of relevance for different users and require different promotion pathways and strategies to encourage uptake:

- scientific understanding
- research tools and methods
- transferable technologies either fitting into or transforming the existing systems
- principles for technology adaptation
- sets of alternatives from which farmers can make informed choices
- decision-making tools.

Figure 4 attempts to show the links between the different research types, outputs and scaling-up strategies, and includes spontaneous diffusion, which almost by definition is demand-led; it is briefly touched on in Section 2.3.2 (Box 4).

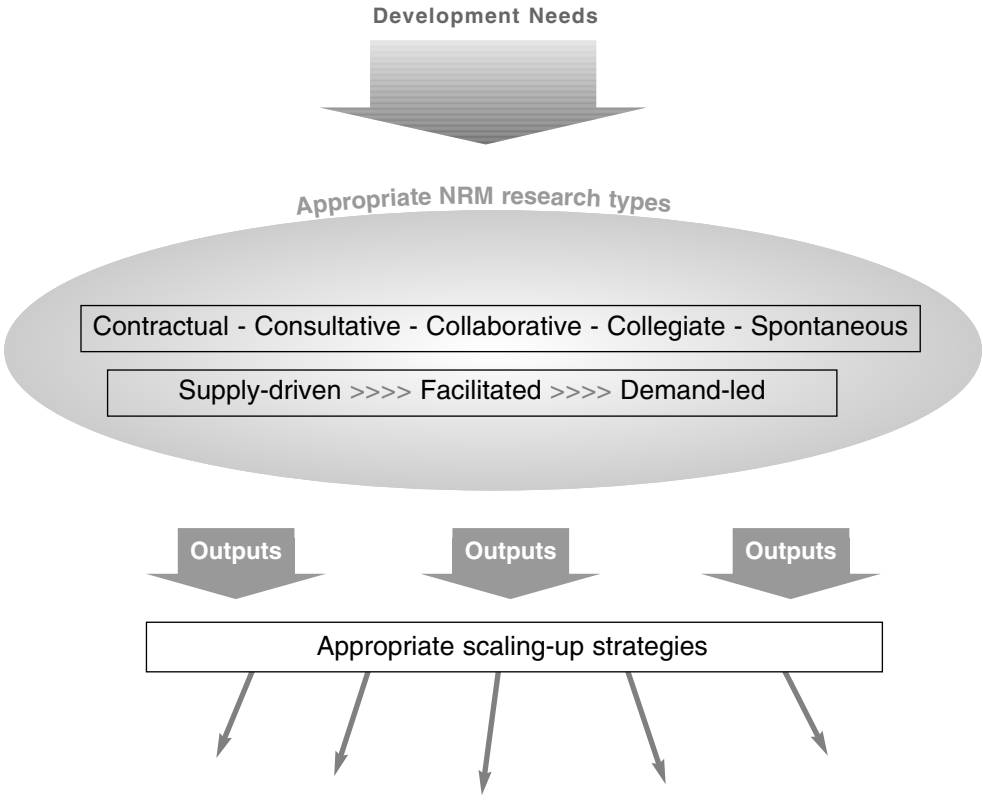

Figure 4 The main types of research following Biggs (1989) classification.

In the following sections we focus mainly on the demand-driven research type, as this has been identified as a key element for successful scaling-up.

1.8 IMPORTANCE OF SCALING-UP FOR DFID

In recent years many donors, including DFID, have responded to the limited uptake of research outputs by including the identification of dissemination pathways and target groups as a mandatory objective of research proposals. However, in many cases this has not moved beyond rhetoric and there is an urgent need to analyse the constraints and provide guidance to put this rhetoric into practice.

In the following section, we provide a brief overview of the main initiatives in the scaling-up discussion within DFID research programmes. This will provide the background to current thinking and approaches to scaling-up, and an initial comparison of the different approaches will help us to identify commonalities, constraints and gaps in the understanding of scaling-up.

1.8.1 DFID research programmes

Currently 7–10% of DFID's annual budget is spent on research in all sectors. It is recognized that DFID's poverty focus research is an accountable contribution to the achievement of DFID's target (Wilson, 2000).

DFID's White Paper on International Development (DFID, 1997) highlights the strategic importance of research:

"Research is an important weapon for the fight against poverty. Without research, many development interventions would fail or be much less successful; and research has significant multiplier effects – solutions to the causes of poverty in one part of the developing world may well be replicable in another. The principle of shared knowledge is an important component of the partnerships which are essential to development."

Furthermore the White Paper emphasizes the existence of an important body of knowledge for some circumstances and recognizes the need for further research in others.

> "Much knowledge is already available but often it needs to be adapted to the particular circumstances of developing countries. In other instances, existing knowledge is insufficient and investment in new knowledge, research and technology development is needed. Results need to be communicated effectively and the conditions created in which they can be implemented."

However, there are less optimistic voices regarding the impact of research. There are those who have seen research as irrelevant to the real issues, as having no poverty focus, as being institutionally led, or as having poor uptake (Wilson, 2000). Recent surveys have shown that 70% of the funding for livestock research in two important agencies has had no impact (Wilson, 2000).

Oudenhoven and Wazir (n.d.) in their cross-sectoral review of scaling-up strategies of research and development programmes describe the situation as follows:

> "In many human development and research circles…dissemination was rarely an issue for deliberate reflection at the start of the project. It was more or less assumed that once a pilot project had been successfully completed, replication would follow as a matter of course. At most, a report would be written and a set of recommendations formulated for further action. This further

> action was considered to be the task of others. As a rule, no information was provided on who the others were, or only in general terms such as 'practitioners', the 'government', or the 'NGO community'. Neither was it made clear how these others should go about spreading or receiving the good news."

Confronted with this situation research has to become more proactive so as not to be left behind in the development process, which is reflected in DFID's increased emphasis on research uptake and impact. The different DFID research programmes have responded in various ways to this new emphasis, one being the commissioning of studies and workshops to understand the current situation and to find ways forward.

Engineering Knowledge and Research Programme

Saywell and Cotton (2000) carried out a literature review and case study analysis with key informant interviewees to identify current thinking and approaches to dissemination of research findings for the Engineering Knowledge and Research Programme (ENKAR). Their key findings are relevant to this review as some of the main issues are of a cross-sectoral nature.

First of all they confirm that the literature lacks an analysis of the user perspective on dissemination of research results. There is little information available on the perspective of NGOs, community-based organizations (CBOs) and other stakeholders in developing countries concerning needs, problems, constraints and priorities for dissemination of research. Equally limited is information on detailed impact assessments of dissemination of research results. The authors conclude that the production of research outputs should not continue without a critical consideration of the value, usefulness and impact of those outputs.

Further key findings show that undue emphasis is still placed on the production of a single, often lengthy output for a homogenized audience. Reasons for this shortcoming include limited consultation between information producers and users of research on the types of outputs and strategies required for dissemination.

Crop Protection Programme

In late 1999, the Crop Protection Programme (CPP) commissioned a series of multidisciplinary studies to examine the factors affecting the uptake and adoption of research in a range of cropping systems in sub-Saharan Africa and South Asia, supported by an analysis of farmers' decision-making. The study teams were then brought together in a workshop to identify common factors affecting uptake of research outputs, to assess which factors the CPP could realistically address, and to formulate measures for the CPP to enhance uptake of research outputs (Hainsworth and Eden-Green, 2000). The recommendations which arose from this process are incorporated in Section 3 of this review.

Livestock Production Programme

To address scaling-up issues, the Livestock Production Programme (LPP) instigated an electronic discussion among stakeholders to agree strategies for knowledge and technology dissemination in three production systems – Forest/Agriculture Interface, Semi-Arid and High Potential. The electronic discussion resulted in a strategy paper for each production system. However, the following statements underpin the strategy being implemented in each system.

- An underlying assumption in the development of the LPP knowledge and technology dissemination strategy is that a poor household's access to and exchange of information is a significant livelihood constraint.

- Most poor livestock keepers interact and exchange information with other resource users/production systems, but displaced, landless and highly mobile people may be so isolated as to be unable to access otherwise well established channels of information. Poor livestock keepers are arguably disadvantaged more by their inability to be heard, to make their needs known, and by an inequality of access to information where knowledge gives priority to privileged resources (this we may call marginalization), than from an inability to hear about general innovations to their advantage.
- Marginalized livestock keepers need to be considered as the main actors in the processes of innovation. Dissemination strategies need to be developed that will contribute to, and enhance local innovation processes within the poorest sectors.

Natural Resources Systems Programme

DFID's White Paper instigated a revision of NRSP strategy towards a research agenda with a more explicit emphasis on poverty reduction. Important elements of this strategy are:

- poverty focuses demand-led research
- use of a systems approach
- partnerships.

During the Conference on Poverty, Rural Livelihoods and Land Husbandry in Hillside Environments (Ellis-Jones *et al.*, 1999) the importance of encouraging the promotion, dissemination and uptake of research outputs was one of the key conclusions. The underlying assumption is that "technical solutions are available", as stated in the latest *NRSP Research Highlights.*

This review is one of the initiatives of NRSP trying to understand the present situation in terms of scaling-up and to contribute to the systematization of experiences.

1.8.2 Challenges for NRM research in hillside systems

Although much of the scaling-up discussion seems to be generic and of a cross-sectoral nature, it is important to reflect on the specific conditions under which NRSP hillsides operate. The following characteristics have to be considered when identifying appropriate scaling-up strategies:

- diverse ecological conditions, reliance on rainfed agriculture, incomplete physical and social infrastructure, risk-prone environments and poor people
- the biotic, abiotic and human processes affecting soils, vegetation and other aspects of land operate on a variety of scales, ranging from the plot up to the catchment level
- these variable scale processes interact with one another, creating complex patterns
- the need to recognize variation on multiple scales is critical
- importance of recognizing not only spatial patterns of soil and vegetation but also patterns created by people and their land management systems
- people use multiple scale criteria for making decisions about land management when faced with changes or options
- different people notice phenomena on a particular scale but may not necessarily notice the connections between them.

The challenge for NRM research is to show impact in terms of targeting the poor, improving management of resources at landscape level and assuring sustainability of processes and outcomes.

1.9 KEY ISSUES ARISING

An overview of scaling-up from within DFID's research programmes and the wider research and development context show two main current strands in understanding scaling-up.

One takes a more narrow perspective to scaling-up and emphasizes the existence of knowledge and technologies and sees the challenge in improving the ways to 'get these technologies out' to target groups over a wider geographical area (horizontal scaling-up).

The other strand acknowledges the multidimensional nature and complexity of scaling-up and stresses the importance of institutional processes and learning and the need to include a range of stakeholders from different sectors.

These two perceptions should not be seen in isolation and it is important to acknowledge that the transfer and adaptation of existing knowledge, as well as the creation of new knowledge is important in the context of NRM research.

The demand for scaling-up seems to be formulated by the knowledge providers (research, donors, etc.) and the literature lacks information on the scaling-up needs and demands from other stakeholders (NGOs, CBOs, etc.) in terms of research.

It is the current development policy agenda which dictates the scaling-up processes. However, the literature recognizes spontaneous scaling-up processes which happen without the involvement of formal institutions.

Learning from experience

2

In this section we will look at a range of different research and development initiatives with the aim of drawing lessons on how they planned or actually achieved scaling-up.

2.1 THE NRSP HILLSIDES PORTFOLIO

Looking at the project portfolio presented in the *NRSP Research Highlights 1999–2000* it becomes obvious that the main focus of research projects is still the improvement of technical solutions rather than on achieving uptake, which is not compatible with the assumption that there are already sufficient technical solutions available to tackle existing problems. If the aim is to shift from improving the '*state-of-the-art*' to improving the '*state-of-practice*', then this should be reflected in the number of projects looking at the 'state-of-practice'. Figure 5 below shows the distribution between technologies and processes of eight NRSP hillside projects.

For the analysis of dissemination pathways in NRSP projects we reviewed 14 project memoranda looking specifically at the sections on uptake pathways and target group identification. The findings are summarized in Table 2.

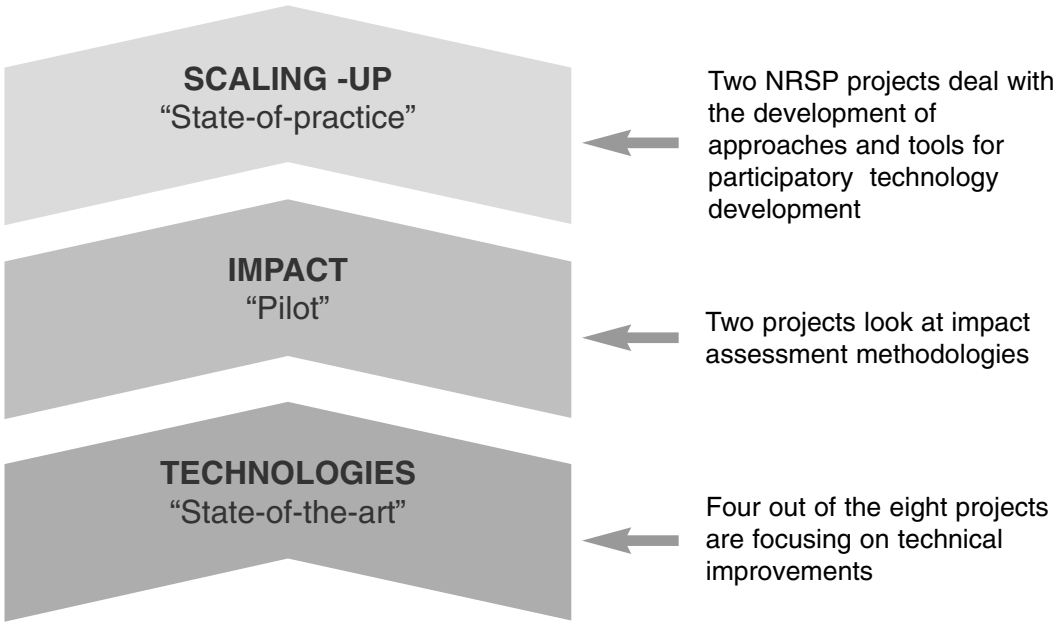

Figure 5 Distribution of NRSP hillsides projects in relation to scaling-up (NRSP, 2000).

Table 2 Modes of dissemination in NRSP hillsides projects

No.	Uptake pathway	No. mentioning	Comments/notes
1	Dissemination of papers in professional and academic journals	11	
2	Workshops	10	Includes regional and international workshops
3	Dissemination of reports	8	
4	Stakeholder involvement in project implementation	6	Includes participation of farmers in on-farm trials
5	Distribution of dissemination materials to key institutions	5	Usually collaborating local partners or very general (NGOs, etc.)
6	Networking	5	Mainly distribution of papers and results to networks
7	Stakeholder consultation	4	Includes consultation before, during and as post-project activity
8	Preparation of training material	3	Without specifying the users
9	Implementation of training	3	Directed towards professionals
10	Integration in broader research and development programmes	3	
11	Personal professional contact	2	
12	E-based means	2	For distribution of results
13	Mass-media	2	No further specification
14	Meetings	2	At different level
15	Inform policy-makers	2	
16	Field day	1	Involving farmers and professionals
17	Feedback to stakeholders	1	
18	Tele-centre	1	No further information

There are several points which arise from the analysis in Table 2.

- First, it is notable that most of the projects propose documentary modes of dissemination. Reports and academic articles together with workshops (national and international, see also below) are the leading three dissemination pathways used.
- Engagement with other stakeholders (policy-makers, NGOs, development organizations, etc.) ranks low on the scale of possible dissemination pathways.
- Judging from the main modes proposed, researchers seem to see their role as documenting results and findings for the scientific sector (horizontal scaling-up) and less in vertical scaling-up by addressing a wider audience.
- A total of 18 uptake pathways were suggested within the range of project memoranda analysed which demonstrates the range of existing approaches.

The immediate conclusion drawn from the analysis of current NRSP project memoranda is that the majority of them have not outlined suitable scaling-up strategies which are likely to lead to successful vertical and horizontal scaling-up. In general, there is an over-dominant focus on dissemination in a documentary form at the cost of engagement with multiple stakeholders. For a research programme like the NRSP this is clearly unsatisfactory and will need to be rectified in the future in order to meet the programme's goal.

In order to reach other stakeholders, greater emphasis should be placed on the production of non-technical reports and non-documentary modes of dissemination (Saywell and Cotton, 2000). Saywell and Cotton provide a comparison of relative advantages and disadvantages of the different dissemination pathways suggested in ENKAR bid documents.

Table 3 is an overview of the most common documentary modes of dissemination and of more interactive modes for scaling-up.

Table 3 Comparison of advantages and disadvantages of documentary and non-documentary dissemination modes

Pathway	Notes	Advantages	Disadvantages
(a) Documentary dissemination modes			
Academic journals	Directed at research community	Informs scientific community of findings, wider impact on intellectual networks	Limited audience, may be written in an inaccessible manner, lacks practical orientation
Paper in professional journals	Directed at practitioner community	Reaches a wide practitioner-oriented community	Academic rigour may be lower than refereed journals
Research reports	Detailed summary of research to satisfy funding requirements or those with high level understanding of subject	Provides a single reference point for all aspects of the research	Assume report read by single audience group, may be written in inaccessible manner
Working documents	Concept notes, field diaries and reports for internal use	May target research findings to particular groups	Problems with limited access
Stand-alone manual	Classic linear dissemination product – single product for single audience	Typically encompasses all research findings from project	Difficult to identify salient points for specific target groups
Training manual	To support an active training process	Helps to translate information into knowledge which can be applied practically	Limited audience Expense
E-based means/Internet	Worldwide electronic network of linked computers	Wide interest in electronic media, immediate, convenient	Access to hardware limited in developing countries

Table 3 *cont.*

Pathway	Notes	Advantages	Disadvantages
(b) Comparison of non-documentary dissemination modes			
Seminars	Face-to-face contact with peers on specific subject	Opportunity to share experiences, potential for networking	Limited audience Expense
Networking	Association of individuals/ organizations which share a common goal or purpose and who contribute resources in two-way exchange	Reaches stakeholders who share common interests, reduces 'reinventing the wheel', potential for interaction, discussion and review of findings	Often low level of active participation, requires strong incentives for participation, time-consuming to operate
Popularization	As a means for reaching a wider audience; influencing policy from below; uses mass-media	Reaches wide audience	Core message may be diluted or misinterpreted during process of popularization
Mass-media/ publicizing	Use of mass-media	Reaches wide audience	No control over interpretation of message
Field days/ demonstrations	Seeing research results on the ground can be persuasive		Limited audience, risk of promotion of blue-prints
Participatory approaches	Knowledge generation and diffusion as integral process with strong stakeholder involvement (e.g. promoting farmer innovation)	Increased ownership, horizontal and vertical integration	Limited institutional incentives for researchers to engage in the process, short time frames of research projects often conflict with a more time-consuming process
Stakeholder consultation	Assessing needs and demands from multi-stakeholder perspective	Increased ownership, better fit, more likely to be sustainable, identification of uptake pathways from early on	Potential conflicts of interest among stakeholders, time-consuming, facilitation skills needed

Source: adapted from Saywell and Cotton (2000).

The main disadvantages of the documentary modes of dissemination is the mostly single and limited audience. Relying on these documentary modes will limit scaling-up overall mainly to horizontal scaling-up.

However, among the project memoranda, there are some projects which suggest more innovative and stakeholder-oriented approaches which can contribute to vertical scaling-up processes (summarized in Table 3b). Workshops are a

popular means of disseminating findings and often incorporate various aspects of non-documentary dissemination modes (see above), however, it is the way in which they are planned and implemented which determines their success. There is anecdotal evidence that in many cases workshops are externally driven, have a biased representation of specific stakeholders and are often merely a forum for presenting selective papers.

In order to draw lessons from the different dissemination modes used in the NRSP projects, it would be necessary to monitor and evaluate the scaling-up process of each project, and also to revisit the projects in a post-project phase to assess the situation. The diversity of dissemination modes encountered across the different NRSP projects suggests that this could be a worthwhile analysis to enhance NRSP's knowledge on appropriate dissemination modes contributing to successful horizontal and vertical scaling-up.

2.2. SWOT ANALYSIS OF CASE STUDIES FROM BOLIVIA, UGANDA AND NEPAL

The case studies were reviewed with the aim of learning, if not generic, then widely applicable lessons about how initiatives can be designed and implemented to best facilitate scaling-up of outputs. SWOT analyses were carried out on three different types of initiatives and then criteria for assessing scaling-up strategies were derived by comparing and contrasting the cases. A pro-poor focus was applied during the analysis in as much as the scaling-up strategies sought should benefit the poorest in any differentiation of target groups.

Information on the case studies was taken from project documents and discussions with project staff. The SWOT analyses are NOT evaluations of the projects. They are attempts to identify issues important to scaling-up. The emphasis was on seeking examples of good concepts and practice. The validity of the findings can be judged in terms of the usefulness and importance of the issues identified.

2.2.1 The case studies

The three cases were chosen to represent a range of initiative types (research project, support to farmer innovations, and a dissemination programme) working to improve NRM across NRSP target countries. Table 4 provides a summary of each case.

The Sustainable Agriculture at Forest Margins (SA/FM), Bolivia initiative was a programme-funded (NRSP and CPP) research project. The objectives of the project included the development of adaptive and participatory research methods and agro-forestry technologies. Research then was the central activity of this initiative and the project's contribution to horizontal scaling-up was to disseminate these outputs during the duration of the project, and to provide researcher-generated products (methods and technologies) suitable for subsequent (post-project) dissemination.

The Promoting Farmer Innovation (PFI), East Africa initiative is a pilot attempt to identify local innovations and innovators, and to facilitate the validation and adoption/adaptation of improved soil and water conservation, water harvesting and NRM practices. Research makes a contribution to this initiative by validating and interpreting local innovations – answering questions that the farmers cannot. Scaling-up (vertical) is seen as the linked, medium-term processes of institutionalizing the PFI approach, influencing policy, and creating the conditions necessary to facilitate policy dialogue and lobbying.

The Sustainable Soil Management Programme (SSMP), Nepal initiative is essentially a mechanism for the scaling-up of soil management practices through the funding of extension projects implemented by collaborating

Table 4 Summary of case studies

Case and countries	Location	Actors	Objectives	Target group
Sustainable Soil Management Programme (SSMP), Nepal	10 hill districts	Project Support Unit, NGOs, Ministry of Agriculture, independent reviewers, farmers organizations	Promote the uptake of sustainable soil management practices in the hills of Nepal	Male and female farmers
Promoting Farmer Innovation (PFI), Tanzania, Uganda and Kenya	Soroti, Katakwi and Kumi Districts, Uganda; Mwingi District, Kenya; Dodoma region, Tanzania	Governments of Tanzania, Uganda and Kenya, UNDP-UNSO and CDCS, the Netherlands	Identification, verification and diffusion of local soil and water conservation, water harvesting and NRM innovations to improve livelihoods and ecosystems	Resource-poor farmers in fragile (arid) ecosystems
Sustainable Agriculture at Forest Margins (SA/FM), Bolivia	Tropical eastern lowlands, Sara-Ichilo region, Santa Cruz	Researchers – CIAT and NRI, NGOs, government organizations, *c.* 200 farmers	Develop technologies and methodologies to enable the evolution of farming systems of resource-poor farmers	Slash and burn farmers at forest/agriculture interface

institutions. The SSMP is uptake (and impact)-oriented and as such represents post-project thinking. The contributions that research and researchers can make to the SSMP initiative are seen as: identifying opportunities and needs for scaling-up sustainable soil management practices; translating research results into practical diffusion messages; capacity-building; partnership-building in participatory technology development, etc.; developing extension methodology; post-project characterization of technologies and impact assessment.

2.2.2 The SWOT analyses

The SWOT analyses addressed the three main phases of the initiatives: the pre-project, the implementation and the post-project phases. For each phase a summary of activities relevant to scaling-up for the three initiative is given. The results of the SWOT analysis for one initiative is summarized both in the text and as a table; the SWOT analysis tables for the other two initiatives are given in the Appendix.

Pre-project phase

Table 5 provides a summary of the activities relevant to scaling-up carried out in each initiative during the pre-project phase.

From the SWOT analysis of the PFI East Africa initiative (Table 6) the following observations can be made on the pre-project activities and

Table 5 Summary of activities relevant to scaling-up during the pre-project phase

Activities relevant to scaling-up	Sustainable Agriculture in Forest Margins (SA/FM), Bolivia	Promoting Farmer Innovation (PFI), Tanzania, Uganda and Kenya	Sustainable Soil Management Programme (SSMP), Nepal
Situation analysis	Through a series of appraisals of research and development institutions	Based on CCD* and appraisals by national governments and donors	Carried out by Governments of Nepal and Switzerland
Identification of target groups	Farming communities within target area	Farmers within arid and fragile areas	Farmers within 10 hillside districts in target area
Setting objectives and defining outputs	By a review of research and development reports, farmer workshop and consultation of, and among collaborators	By UNDP and national governments based on CCD	By agreement between donor and Government of Nepal
Collaboration	Stakeholder workshop to establish adaptive research network	UNSO, donor and national governments, ministries and local NGOs	Competitive fund open to all institutions, formal and informal
Setting up monitoring and evaluation	Formally against milestones	Seen as an internal process to assess properties of programme; being developed as part of the programme	Seen as a mutual learning process; being developed as part of initiative
Funding	NRSP and CPP, collaborator contributions	Government of the Netherlands	Government of Switzerland (Interco-operation)

*Convention to Combat Desertification.

subsequent scaling-up of project outputs (products – validated technologies; processes – the PFI approach).

- The *situation analysis* was based on the knowledge and information generated by the collaborating institutions on the situation in target areas, and was linked into international undertakings (i.e. the Convention to Combat Desertification – CCD). Institutional needs and operational capacity of partners was also taken into account. The key aspect here is the precision of the identification of the priority target group so that the relevance of the initiative is optimized.
- To achieve pro-poor impact, the *identification* (and characterization) *of target groups* has to clearly define and assess the level of well-being of those to be involved in, and to benefit from the initiative. PFI East Africa focuses upon good and innovatory practice of farmers in the target areas (arid land that is ecologically fragile). The merit in this approach is that it

Table 6 SWOT analysis of the pre-project phase: PFI East Africa

SWOT	Situation analysis	Identification of target groups	Setting objectives and proposing outputs	Collaboration	Setting up monitoring and evaluation	Funding
Strengths	Based on collaborating institutions knowledge and linked into international undertakings (e.g. CCD). Institutional needs and field problems.	Focusing on good and innovatory practice of resource-poor farmers.	Through raising of awareness and inter-institutional dialogue.	Multi-faceted and within different contexts. Open to different types of stakeholder who can make different contributions.	Conceptualized as multi-faceted and within differents contexts.	Donor support.
Weaknesses	Sequencing of programme development processes and field-based activities.	Danger of promoting innovations beyond the capacity of the poorest.	Unclear how objectives are set with farmer groups	Donor and foreign institution driven.	Not thoroughly developed by mid-term point.	Only medium-term funding secured.
Opportunities	Programme development can learn from field-based activities.	Demonstrate the value of poor farmer innovations to extension and research staff and decision-makers.	Derive objectives from field-based experiences of the innovation process.	Capacity-building from farmers through extension and research staff to decision-makers.	To develop a multi-actor mutual learning process.	
Threats	Disengagement of programme development and field-based activities.	Create an elite of innovative farmers.	Disengagement of programme development and field-based activities.	Lack of appropriation of process by top-down-oriented stakeholders.	Segmentation and disarticulation between programme development processes and field activities.	

demonstrates the value of farmer innovations to extension and research staff and decision-makers, and thereby starts the process of (professional reversals required to) overcoming the conventional 'top-down' bias. However, as with the other initiatives reviewed, target agro-ecological zones and the farmers that live within them will not necessarily targeting the poorest farmers, and in the case of the PFI East Africa initiative there is a danger of promoting innovations without considering the capacity of the poorest.

- *Objectives and outputs* were set by PFI East Africa through raising awareness of the importance of farmer innovations and inter-institutional dialogue among collaborating institutions. This strategy gives an opportunity to derive objectives from field-based experiences of the innovation process and as such provides the basis for farmer-oriented, scaling-up mechanisms.
- The criteria of 'plurality' characterizes the *collaboration* sought by PFI East Africa. The contributions to the programme by different stakeholders is seen as multi-faceted, within different contexts, and open to many different types of stakeholders.
- *Monitoring and evaluation* is also conceptualized as multi-faceted. As well as providing information on the performance of the initiative for the purpose of modification, monitoring and evaluation provides evidence of the efficiency and effectiveness of PFI to other actors (government, donors, etc.) as part of the policy-maker lobbying required in the scaling-up process. However, by the mid-point of the initiative plans for monitoring and evaluation had not been finalized.

Project implementation phase

Table 7 provides a summary of the activities relevant to scaling-up carried out in each initiative during the project implementation phase.

From the SWOT analysis of the SSMP Nepal initiative (see Table 8), the following observations can be made on the implementation activities and subsequent scaling-up of the initiative's outputs (products – uptake of validated sustainable soil management technologies; processes – the competitive fund as a mechanism for improving extension projects).

- *Capacity-building* – the SSMP does not invest in institution-building or training. However, the experiential value of project proposal and implementation is clear, due to the emphasis on peer reviews and evaluation activities an institutional learning process is encouraged.
- *Support studies* represent an important opportunity to build up baseline data on farming systems from information generated and held by collaborating institutions. On this basis it will be possible to demonstrate uptake and impact of sustainable soil management technologies, and thus influence policy to achieve support and continuity of the approach.
- The SSMP has a very clear and useful definition of the roles of different agents in the process of scaling-up sustainable soil management technologies. Effective *partnerships* can hence be constructed. Actors that demand and supply technology, and those that support technology validation, adaptation and uptake are identified. Other resource organizations contribute with products and by building technical capacity.
- *Networking* is achieved by the SSMP between farmers, farmers and extension agents, and extension agents and researchers. Support for the formal extension service in Nepal has been withdrawn, so to some extent the SSMP initiative is filling a vacuum. Scaling-up under these conditions requires not only the recognition and appropriation of roles (see partnerships above), but also the establishment of the communication mechanisms necessary for any agricultural knowledge and information system.

Table 7 Summary of activities relevant to scaling-up during the implementaion phase

Phases and activities of initiatives	Sustainable Agriculture in Forest Margins (SA/FM), Bolivia	Promoting Farmer Innovation (PFI), Tanzania, Uganda and Kenya	Sustainable Soil Management Programme (SSMP), Nepal
Capacity-building	Staff of collaborating institutions trained in participatory research methods	Staff of collaborating institutions trained in participatory approaches and facilitation of innovation methods	None mentioned
Support studies	An assessment of dissemination strategy and uptake likelihood	Responding to specific needs, e.g. gender aspects, inventories of related projects, evaluation of project components	None mentioned
Partnership-building	Involvement of collaborating institutions	Research organizations drawn in to validate local innovations; multi-disciplinary approach sought	Collaborative projects encouraged by competitive funding
Networking	Development of regional applied research network	Inclusive approach to building up collaborating institutions	Farmer groups linked Project exchanges facilitated
Policy dialogue	None mentioned	Engagement with ministry of agriculture and other government organizations Validated findings made available to policy-makers through 'lobbying' process	Close contact with government organizations maintained Aggregated findings reported
Raising of awareness	Multi-media dissem-ination of findings	Multi-media dissem-ination of findings	Multi-media dissem-ination of findings
Institutionalization	Uptake of methods by main collaborating institutions	Investment in demonstrating benefits of PFI approach and complementarity with government organizations' objectives	Effectiveness of competitive fund as an institutional process to be demonstrated
Monitoring and evaluation	By technical support staff	Qualitative and quantitative assessment of progress achieved by initiative (under development)	Projects evaluated every year and proposals required for next year's implementation Reflection on performance encouraged

Table 8 SWOT analysis of implementation phase: SSMP Nepal

SWOT	Capacity-building	Support studies	Partnership forging	Networking	Policy dialogue	Raising awareness	Institution-alization	Monitoring and evaluation
Strengths	None mentioned. However, the experiential value of project proposal and implementation is clear.	Individual projects funded by the initiative could be regarded as such.	Demand, supply and support actors identified. Other resource organizations contribute with products and by building technical capacity.	Building between 'leader' and other farmers, and between different extension organizations.	Project results provided to policy-makers. Linkages to political leaders in NGOs.	Network of 3000 leader farmers and 20,000 participating families developed. Multi-actor meetings.	Close links with government. Competitive process incentive to institutions to improve capacity.	Reflection encouraged on pilot experiences (e.g. gender implications). Projects re-submit proposal each year.
Weaknesses	Institution-building not part of the initiative.			Consultation processes between collaborating institutions and target groups.			Funding insufficient to allow competitive fund to achieve autonomy.	Under developed before initiative commenced.
Opportunities	Competition between project proposers leads to improvement.	Build up base-line data on farming systems from collab-orating instit-utions to demonstrate uptake and impact.	Provide incentives for partnership development.	Use sustainable soil management as a basis for more holistic agricultural development.	Aggregate and assess findings from individual projects and derive policy-relevant information.	Use SSMP model as a basis for more holistic agricultural development.	Develop funding mechanism that allows SSMP to be sustainable and to increase scope.	Mutual learning process where evaluation is multi-actor and pro-active.
Threats	Difficult for farmer organ-izations to compete with government organizations and NGOs.		Existing processes of poor farmer marginalization not overcome.	Existing processes of poor farmer marginalization not overcome.				

- Evidence exists in the SSMP experience for the policy impact (e.g. use of fertilizers). There is an opportunity to develop a *policy dialogue* on the major issues identified through SSMP-funded projects by aggregating and assessing findings from individual projects in plural and open fora.
- *Raising awareness* – the primary target group has 3000 leader farmers and 20,000 participating families involved in SSMP projects. Multi-actor meetings where the technologies are discussed are held to inform those directly involved in the SSMP; this activity is a prerequisite for scaling-up.
- The issue of how competitive funds can be *institutionalized* is fundamental to the sustainability of the process. Several options exist including locating the administration of the fund within ministry departments, or establishing an independent administrative unit. In the case of SSMP, close links exist with the Nepalese government and once Interco-operation withdraws, the task of continuing the competitive fund will rest with the agriculture ministry. The adoption of the competitive process by extension institutions thus producing efforts to improve competitiveness is expected to lead to an improvement in extension performance. In this way the competitive fund institutionalizes better practice by providing incentives.
- As part of the *monitoring and evaluation* process the SSMP encourages reflection on pilot experiences, e.g. gender implications of sustainable soil management technologies. In addition, projects have to submit annual proposals for their next activities based on an appraisal of the previous year's outcomes. The main criterion of this reflective process is attaining impact within the target group. Effective scaling-up requires that projects/initiatives learn lessons iteratively and in an accumulative way. A monitoring and evaluation system that is based on a mutual learning process where evaluations are multi-actor and pro-active provides the basis for successful scaling-up.

Post-project phase

Neither the SSMP Nepal, nor the PFI East Africa initiatives have reached a post-project phase as yet. Indeed both initiatives are seeking funding to allow further implementation phases. The SA/FM Bolivia ended in 1999 and can be considered to be in its post-project phase.

The activities relevant to scaling-up of the products and processes of initiatives are summarized in Table 9.

Table 9 Summary of activities relevant to scaling-up during the post-project phase

Phases and activities of initiatives	Sustainable Agriculture in Forest Margins (SA/FM), Bolivia
Developing and implementing an exit strategy	The project concluded its activities and the non-local staff withdrew
Documentation of outputs	Final technical report and other output documents prepared
Dissemination of outputs	Documents were distributed to local organizations involved in dissemination of technology, local decision-makers and interested organizations in other regions
Post-project evaluation	Project leader completed evaluation formats Peer review process of documentation
Impact assessment	None known

The concept of scaling-up in the SA/FM Bolivia project is closely related to the dissemination of agro-forestry technologies and adaptive research methods most often by publication of documents. As we will see from Sections 3 and 4 of this review this falls far short of what is considered an adequate scaling-up strategy.

The strengths and weaknesses of the approach taken to scaling-up in the post-project phase of the SA/FM Bolivia case are summarized in Table 10 below. Essentially the foundation for effective scaling-up in the post-project phase is laid in the two previous phases. For example, if a thoughtful, plural and inclusive process for developing an appropriate exit strategy has not been gone through, it is unlikely that the project conclusion with funding and staff withdrawal will have a positive scaling-up impact. The SWOT analysis of the SA/FM Bolivia project produced the following lessons.

- *Development and implementation of an exit strategy:* discrete and finite project funding requires planning past the end of the project to its achieve purposes and goal and imposes a

Table 10 SWOT analysis of post-project phase: SA/FM Bolivia

SWOT	Development and implementation of an exit strategy	Documentation of outputs	Dissemination of outputs	Post-project evaluation and impact assessment
Strengths	Discrete project funding requires planning past the end of the project to achieve purposes and goal and a fixed exit date.	Systematic conclusion of project activities.	Documents provided to technology dissemination organizations.	Milestone and evaluation formats provide evidence of activity to output achievement. Peer review process.
Weaknesses	Concentration on output rather than purpose and goal levels.	Task taken on by only a few project staff.	Target producer group excluded by inaccessibility of documents.	Output to purpose, and purpose to goal levels not evaluated. Target producer group not included in evaluation team.
Opportunities	To hand over ownership of project processes and products.	Initiate an assessment of project outputs by project staff to learn process lessons on implementation.	To assess contribution of project outputs to purpose through evaluation of uptake.	Learn lessons from processes. Participatory and plural evaluation of outputs.
Threats	Interests of local and non-local project staff diverge at the end of the project.	Seen only as providing documentation for peers.	Seen as a purely quantitative process and feedback on outputs not sought or appraised.	Poor monitoring and evaluation provision in implementation phase impedes thorough post-project evaluation.

fixed exit date. These factors may mean that the interests of local and non-local project staff diverge at the end of the project, local staff being the key to scaling-up, yet not always recognized as those doing the work.

- *Documentation of outputs*: this process can provide the setting for a thorough assessment of project outputs by project staff and is an important opportunity to learn and document process lessons on implementation. Too often this is seen only as providing documentation for 'scientific peers'.
- *Dissemination of outputs*: target producer groups can be excluded by the inaccessibility of documents. However, the dissemination process is a chance to assess the contribution of project outputs to purpose through an evaluation of uptake of outputs.
- *Post-project evaluation and impact assessment*: milestone and evaluation formats provide evidence of activities leading to production of outputs. The peer review process is also important. However, poor monitoring and evaluation provision in the implementation phase impedes thorough post-project evaluation. Thorough and effective scaling-up of outputs requires that a participatory and plural evaluation of outputs is done. It is important to learn the process lessons.

2.3 WIDER EXPERIENCES

There are few cases of successful scaling-up of NRM research, and most emerging analyses focus on key elements of scaling-up.

2.3.1 NGO experiences

On a broader development basis, efforts have been made to assess the strategies that NGOs can use to maintain and increase their impact (Edwards and Hulme, 1992, 1998). Uvin *et al.* (2000) examined the case of five established NGOs in India and identified patterns of scaling-up. These are linked to the typology developed by Uvin (n.d.) (see Section 1.6). The following approaches were used in various combinations.

- Growing in size, and increasing the number of beneficiaries, usually dependent on donor funds, though substantial amounts of funding are also given by government. Nevertheless there was also a strategic decision by the larger organizations not to expand beyond a certain point so as not to become too bureaucratic and removed from the grassroots.
- Increasing activities from the very specific to a mix of income generation and service provision, based on the demand for services and livelihoods from the grassroots. This was often followed by a more specialized programmatic approach in collaboration with other specialized agencies, in terms of horizontal and vertical integration of key activities. This was necessary to be able to successfully address multidimensional issues, for example, in a sector combining production and marketing, or developing higher level community networks. In some cases there were economic and management benefits in decentralizing or even spinning these off as autonomous units from the NGO.
- Broadening indirect influence to affect and modify policies and behaviours of other sectors, mostly after some time in direct work with communities. Some NGOs, often those in the developed countries, have a sole focus on this. The credibility built up through their grassroots work makes them influential, partly through coalitions, networks and special units or think tanks, in contributing to the analysis and changes in local and even national policy. New or modified government policies and programmes resulting from NGOs' advocacy is an area of success which NGOs often claim, but which is often difficult to trace.
- Scaling-up institutional sustainability. There were few examples of NGOs moving on from the small team and project management mode

to a more self-sustaining and programmatic approach, and where this happened it was largely in relation to micro-credit and dairy farming. Other examples of large NGOs providing expanding and largely self-financing programmes to very large numbers of rural poor are the former Bangladesh Rural Advancement (BRAC) and its poultry programme (Saleque, 1999), the Association for Rural Advancement (ASA) (a Grameen Bank approach) in Bangladesh (Jain, 2000), and the Fundacion Social in Colombia (Pierce, n.d.). These are often run on simple and decentralized, administrative procedures, which yet adhere to strong values. These large expanding programmes can also be sustained by channelling a steady supply of government funds such as those for micro-credit and poverty relief work.

Key successful strategies arising from an analysis of NGOs' experiences relevant to research both in terms of process as well as potential NGOs forming partners for scaling-up include:

- key is maintaining relevance to the grassroots, both through local work and participatory processes
- mobilizing more sustained government resources and identifying self-financing mechanisms
- looking at multidisciplinary links between interventions (e.g. production and marketing)
- building community and higher level networks to influence policy, though it is difficult and complex to demonstrate the impact of advocacy
- simplifying procedures through an adaptive process often into focused targeted programmes (e.g. Grameen system), while maintaining values-driven results.

2.3.2 Experiences from NRM and research

There are few instances of scaling-up being methodically integrated into NRM and research projects, or detailed empirical analyses of successful cases. Nevertheless various workshops and papers have begun to draw out key features of scaling-up, based on useful approaches and components of various projects, as well as recognizing that there may be important lessons to be learnt from the spontaneous diffusion of new ideas among farmers (see Box 4).

The CGIAR–NGO workshops on scaling-up strongly emphasized the goals of equity, empowerment and social change (IIRR, 2000; see also Section 1.5). Through discussions and after presentations of several cases on sustainable agriculture and innovations from a mix of NGO,

Box 4 The IIRR (2000) workshop report identified some important aspects of spontaneous diffusion of ideas, which are important to bear in mind in a drive towards more demand-led research

- It is usually a response to an identified need
- A person with unique skills and vision often drives the process
- There are perceived intrinsic benefits of the ideas being disseminated
- The idea is simple, cheap, and adaptable
- The idea is easily communicated through indigenous routes
- The idea comes from a credible source

research and government experiences, key principles and approaches for success were identified (see Table 11). While recognizing that scaling-up is multidimensional, it was felt that there was no one perspective by how key principles or approaches should be prioritized in a sequential order. The participants did recognize that they could be approached through any combination of the following processes:

- communication – especially sharing of knowledge and options
- learning – building the capacity to innovate in order to facilitate wider and local adaptation to changes, from an organization's point of view in particular proceeding through the learning stages of effectiveness, efficiency and expansion; they also identified the need for strategic research
- market development – ensure that the livelihoods and economic aspects of sustainable agriculture are addressed by using and building on potential market forces
- monitoring and measuring costs and impact – this is largely to be able to show the cost benefits and proof of impact of the more participatory NGO approaches to donors and government.

Drawing on several case studies and their own experiences, participants at an ICRAF workshop on scaling-up successful initiatives in agro-forestry identified 10 essential elements that need to be in place for any strategy to be successful (Cooper and Denning, 2000; see Table 12).

The subsequent suggested frameworks arising from the ICRAF and CGIAR–NGO workshops are discussed in Section 3 as they were only indirectly drawn out of the case studies.

Looking at the scaling-up of the management of common pool resources which are more complex

Table 11 Principles for scaling-up identified by the CGIAR–NGO Committee

Five major principles
• Partnerships (catalyst role, networking, farmer-driven, stakeholders–actors) • Financial sustainability (market development and access) • Management: start small, simplify and build on success for effective management • Policy support: change policies to create enabling environment • Local capabilities should be based on existing local dynamics, capacity-building–strengthening, organizational development, participation
Followed by more detailed principles and approaches
• Involvement of multiple stakeholders and coalitions and alliances • Consensus building • Sustainability must be considered • Market development, access and viability • Indicators and measures of success • Expanding capacity and use of participatory approaches • Engagement with and sense of ownership at grassroots level • Knowledge and capacity-building and sharing at all levels, systemization of experiences • Development of grassroots organization • Accountability

Source: IIRR (2000).

in nature in terms of shared use and users, Farrington and Boyd (1997) found isolated cases of improved management. They give some key conditions based on a wider body of knowledge on forest management, which indicates the importance of joint action at the community level. However, they identify only one case, the Indo-German Watershed Development Programme, where scaling-up was been built in from the beginning of the programme (see also Farrington and Lobo, 1997). While they recognize the need for participation, they propose the necessity for more rapid ways than the long-term NGO approach to empowerment. They found that improved management must be based on multi-agency partnerships and, based on previous experiences, it will have to have structured agreements in place before implementation (see Table 13).

However, even here they recognized that the difficulties are great, for example, in the selection of target villages, where few may meet the necessary criteria of having similar social and ecological boundaries.

Other experiences support the idea emerging from NGO experiences that approaches should not be static. There has been an interesting evolution of soil and water conservation support activities in relation to projects with the Zimbabwe extension services (AGRITEX) (Hagmann *et al.*, 1998, 1999) where there "…was an adaptation of

Table 12 ICRAF workshop scaling-up initiatives in agro-forestry

Ten fundamentals for scaling-up

- Relevant technical options
- A farmer-centred approach to research and extension
- Empowerment and capacity-building of local institutions
- Effective germplasm production and delivery systems
- Appropriate market access and strategies for agro-forestry products
- Enabling policies that support adoption
- A rigorous monitoring and evaluation framework for research and development
- Cost-effective research and development partnerships
- Knowledge and information sharing systems
- Effective facilitation of the scaling-up process

Source: Cooper and Denning (2000).

Table 13 Scaling-up initiatives in the Indo-German Watershed Development Programme

- Setting of appropriate indicators for the selection of watersheds, villages and local-level NGO partners, and the design of local-level collaborative mechanisms
- Design of village level mechanisms for participatory planning, learning and implementation
- Design of a sustainable mechanism for screening and funding individual proposals submitted for watershed rehabilitation
- Mobilization of administrative and political support from the early stages
- Establishment of channels for drawing on technical expertise in the post-rehabilitation period

Source: Farrington and Boyd (1997).

approaches over time as the various shortcomings of various approaches to achieving the ultimate goal (...the large-scale spreading of technologies) became apparent. The project started from adaptive on-farm research to participatory research, then to participatory technology development and then participatory extension as the vehicle for scaling-up... Once the approach developed was accepted by the extension department, the project developed into an institutional reform project."

While not explicitly addressing scaling-up there has been different work on institutionalizing participatory research (Martin and Sherington, 1997) and on community-based and participatory approaches to NRM (Uphoff, 1998; IIED, 2000). These largely support the main strategies identified above, for example, Martin and Sherington (1997) emphasize the need to build local capacity and linkages, as well as being flexible to changes throughout the research programmes, and raise concerns on the monitoring of efficiency and effectiveness under such conditions.

An important point to emerge is that there is probably no simple dividing line in the roles of research and development as illustrated by the example from Zimbabwe above. Biggs (1995) summarizes this well in discussing sustaining research impacts (time dimension of scaling-up).

> "The rapid rural surveys of the early 1970s in Bangladesh are examples of researchers continuously monitoring and learning from a whole range of innovators in rural areas. The development of the Grameen Bank represents a type of rural development experiment. What is significant about the Grameen Bank is that it is an example of an 'experiment' not taking place in a 'social laboratory' but in the reality of the existing political and institutional environment. The organization has a history of adapting in response to new conditions. This is one of the main reasons for its long sustained existence. The inability of FSR [farming systems research] to address identified technical and institutional problems of rural people in some situations arises from its restrictive nature – concentrating on the problems of individual farmers in representative groups in isolation from the political and institutional agrarian context. A reluctance to address these topics has been a major impasse for many in the FSR fraternity."

Biggs (1995) illustrates the complexities of scaling-up by various examples of land tenure issues demoted to 'development' rather than directly researchable issues and calls for:

- recognition of the political nature of FSR in rural development
- increasing the range of FSR analysis to include ownership and management of common property
- caution in the use of 'ideal' models and manuals, better to develop locally appropriate approaches and materials
- increase the use of political economy and institutional analysis methods and techniques
- broadening the view of democratic participation even within organizations trying to do FSR
- practitioners of FSR can do much to learn from each other.

Some key issues arising from an analysis of scaling-up, institutionalizing and sustaining NRM and participatory research experiences are that research (e.g. FSR) has not looked at the wider context sufficiently to maintain relevance and interaction with grassroots and the wider institutional and specific policy context. Part of this is reflected in the need to prove that true participation is relevant, but also strongly suggests that research outputs need to be adaptive and responsive to have

any likelihood of showing pro-poor scaling-up success. While there have been few successful cases of scaling-up analyses undertaken, there have been indications from the above assessments of some key factors within projects that contribute to better scaling-up. Many of these emphasize the importance of considering local and national demand, eventual sustainability and scaling-up early on in the project rather than after the project has finished.

Planning stage:

- clear link with local development needs and grassroots groups
- building local ownership and participatory collaborative mechanisms especially with local agencies
- looking at the local development context, including the institutional and political context.

Implementation stage:

- mobilizing partnerships
- developing local community capacity
- simplifying approaches (with targeted participation)
- moving away from static to more flexible approaches to be able to modify projects to new circumstances and learning
- identifying potential markets (i.e. looking at the downstream relevance of technologies)
- mechanisms for increasing knowledge sharing.

Post-project stage

- The long-term sustainability of the process should be considered from the early stages (including an examination of cost-effectiveness); this relates to funding mechanisms as well as institutional support mechanisms. Resources should be allocated to the post-project stage to follow these through.

2.4 KEY ISSUES ARISING FROM THE CASES

The identification of key findings will be a guide for the development of a strategic framework, which is presented in Section 3.

- The majority of cases considered scaling-up issues at the end of the project. In the case of NRSP projects, scaling-up strategies mainly focused on disseminating project findings primarily through documentary-based approaches. The SSMP and the Indo-German Watershed Programme built in scaling-up considerations from the beginning. Other projects have adapted implementation during the course of the project to achieve scaling-up.
- Researchers seem to document results and findings mainly for the scientific sector and, therefore, they commonly limit their contributions to horizontal scaling-up.
- In order to be successful in terms of improving the livelihoods of the poor, it is important to identify carefully the specific target group. Many of the cases determined their target group quite generally, e.g. 'farmers in hillside districts', or 'farmers in the forest/agriculture interface'. However, targeting farmers based on agro-ecological criteria will not automatically target the poorest. The cases from the NGOs provide good examples of being more specific in the identification of target groups.
- Policy dialogue is crucial for vertical and horizontal scaling-up. However, only a limited number of the cases mention this as a means for scaling-up. Good examples again derive from the NGO sector as well as from PFI and from one NRSP case.
- Aspects of multidimensionality of problems and needs, building on existing initiatives and institutions, analysing the stakeholders involved, etc., are considered less by the research cases (e.g. NRSP cases) which focus

more on a specific technological aspect rather than on processes and principles.

- Related to the above issue is the identification of realistic and existing pathways for proposed outputs. The NRSP cases, for example, rely heavily on the production of documents for scaling-up the research outputs, whereas other cases link into existing development initiatives or extension structures like the AGRITEX programme.
- Most of the cases emphasize the importance of working with different partners in order to facilitate scaling-up. The success of this is linked to the intensity and closeness in which communication and collaboration among partners takes place.
- The importance of institutional learning and capacity development as a parallel process of research and development is a key condition for successful scaling-up. For example, cases like AGRITEX and SSMP where, for instance, the monitoring and evaluation activities of the project are seen as a mutual learning process, which is iterative and accumulative rather than a post-project activity.
- The NGO cases stress the importance of cost-effectiveness and self-financing as a key aspect for successful scaling-up, whereas the more research-oriented cases seem to rely on additional funding for scaling-up at later project stages. SSMP provides an interesting example of competitive funds which have to be institutionalized in order to be sustainable.
- There was little emphasis and information among the cases on measuring the impact of scaling-up. One of the few cases is SSMP where post-project impact assessment is mentioned as an important activity. PFI identifies monitoring and evaluation as a key element for policy advice and lobbying, which is important for successful vertical scaling-up.

Although many of the points mentioned above are generic across the project cycle, the outcomes of the Whitstable workshop and the case study analysis indicate that there are elements which are particularly relevant to consider at specific stages of the project cycle.This will be explored in more detail in Section 3.

A conceptual framework for identifying strategies

3

In order to take a structured approach to scaling-up NRM research, a framework is required which systematizes the different elements. This was confirmed by the participants of the Whitstable workshop as well as by the recent ENKAR review (Saywell and Cotton, 2000) which emphasized the need for a strategic framework to guide dissemination activities as one of its key recommendations.

It can be difficult to identify elements of good practice to develop a framework to guide future work, particularly where examples of success are widely scattered and arising from a broad range of perspectives. Most cases do not have simple models or frameworks that can be generally applicable. Nevertheless various workshops and papers have produced suggestions on key strategies which should serve as guides to scaling-up NRM. Few, apart from the ICRAF workshop, and those papers focusing on institutionalizing participatory research, have looked at scaling-up research *per se*.

3.1 FRAMEWORK INITIATIVES FROM WIDER EXPERIENCES

Before trying to consolidate ideas from the various experiences and make recommendations for our own framework, we will examine the structure of other frameworks that have been suggested from the literature review.

The ICRAF workshop identified key objectives, activities and important considerations with regards to implementing the 10 fundamentals of scaling-up (see Table 14). These fundamentals are similar to key factors identified for scaling-up urban upgrading programmes (Imperato and Ruster, 1999, based on World Bank case studies), and institutionalizing participatory research (Martin and Sherington, 1997; Pound, 2000).

The CGIAR–NGO workshop recognized specific pathways for scaling-up, starting from the identification of needs, to having people or events which serve as 'sparks' or catalysts to initiate a planning stage, through to the management and outcomes of the scaling-up process (IIRR, 2000; and see Table 15).

This approach has parallels with the participatory extension approach developed in Zimbabwe (Hagmann *et al.*, 1998) (see Section 1.7). They recommend starting with broad social mobilization and participatory issue identification, leading to an implementation and experimentation process, leading to a participatory screening of options which can then lead to research or dissemination pathways.

3.2 DEVELOPING A FRAMEWORK FOR SCALING-UP NRM RESEARCH

Project-oriented development activities can be criticized for being too donor-driven, time-bound, and often too narrowly focused. They do nevertheless serve as a primary tool in terms of moving from ideas into action. We have, therefore, chosen the broad flow of project design to develop a framework for scaling-up strategy which systematizes the strategic elements identified in the previous sections.

Table 14 Ten fundamentals for scaling-up identified at the ICRAF workshop; activity details not given

Fundamental	Outcome desired	Important considerations
Technical options	Range of existing agro-forestry innovations identified and prioritized with farmers, with plan of participatory evaluation. Biophysical and socio-economic boundary conditions of innovations determined and mapped.	Researchers need to have capacity to analyse community issues, and farmers need to be involved throughout.
Farmer-centred research and extension	Research and development partners will have worked with farmers in developing and adapting new innovations, describing adoption and impact. Partners and farmers will be well placed as agents of change for scaling-up. Farmers and communities will have heightened capacity to take a more central role in research and development of more demand-led innovations.	Need to maintain link to livelihoods, and systems to monitor process need to be in place.
Local institutional capacity	Through training and facilitation develop broad-based support and empowerment of local communities, and identify impact and process.	Representative and accountable community organizations and systems are necessary.
Germplasm	Strategies will take into account availability of germplasm, contrasting germplasm production systems identified, and local capacity and opportunities for germplasm production, marketing and diffusion developed.	Quality tree germplasm is often single greatest factor affecting large-scale adoption of agro-forestry.
Marketing	Build local and institutional capacity and develop strategic partnerships in the marketing process. Improvement of marketing information systems, define successful marketing strategies responding to consumer demand, and influence policy.	Consumer demand, including local consumption, and understanding market risks, needs to be identified to develop a marketing programme which stabilizes and diversifies production and income sources.
Policy options	Policy and decision-makers need to develop greater awareness of key issues and options for scaling-up. Capacity of NARS and others needs to be increased to undertake policy research. Increased involvement of local communities to engage in policy debate. Identification of key policy and institutional changes required.	Need to develop good communication links between policy-makers and researchers through frequent briefings, attendance at farmer field days and at all stages of planning and analyses.
Learning from successes and failures	Enhance analytical and systematic scaling-up of innovations and the processes of scaling-up. Improved capacity for participatory monitoring and evaluation.	Need to develop an 'analytical learning culture' amongst partners, and ensure involvement of communities, and feedback mechanisms into research process.
Strategic partnerships	Develop a strong network of partners with shared and complementary scaling-up agenda. Partnerships will be continually reviewing the efficiency and effectiveness of partnership arrangements, including frames of collaboration and exit strategies.	Partners must allow for transaction costs and resources required for this. There should be a focus on existing organizations, and developing wider stakeholder representation, with emphasis on policy-makers and local leaders.

Table 14 *cont.*

Fundamental	Outcome desired	Important considerations
Knowledge and information sharing	Develop easy access to relevant, high-quality and appropriately packaged knowledge and information for all stakeholders responsible for, and promoting scaling-up.	Depends on financial and institutional sustainability of information systems, appropriate packaging of information for different stakeholders, and easy access to that information, with an appropriate feedback system.
Facilitating scaling-up	Set up monitored collaborative scaling-up initiatives. Develop capacity to facilitate scaling-up and increase sharing of experiences across countries, based on broad-based local support and farmer-led research and dissemination.	Facilitation and skills for scaling-up need to be embedded in research institutions and with their partners, and this takes time and resources, and documentation of experiences.

Source: summarized from Cooper and Denning (2000).

Table 15 Framework checklist for planned scaling-up

The pilot stage	The 'sparks'	Understanding scaling-up	Managing the scaling-up process		The desired impact	The desired outcome
			Planning and implementing	*Monitoring and evaluating*		
Small-scale initiative/ experience	Crisis, questions, success Individuals, champions Critical mass Policies and initiatives Advocacy Markets Communities identify need to scale-up Need to show impact Global trends	Scope Dimensions Challenges Models Institutional contexts	Vision is dynamic Catalysts Actors (not targets) Decision and approach to scale-up is based on various aspects – vision, successes, applicability Capacities Scale-up ability to influence decision, not just technology or process Identify strategies for local participation Spontaneous diffusion Factors	Requirements Monitoring Indicators Benefits Costs	More quality benefits to more people over a wider geographic area, more equitably, more quickly, and more lastingly	Empowerment and social change

Source: adapted from IIRR (2000).

Before we go into detail on the strategic elements we would like to note the following points.

- In support of similar observations made elsewhere, creating an impact from research results has focused heavily on the 'post-project' or dissemination stage (see Section 2.1). Many of the key strategies which have been identified as prerequisites for successful scaling-up need to be addressed more extensively in the pre-project and implementation phases.
- Project design is an iterative process, within a wider sphere of programmes and policies. A project can be seen as one learning event in itself and, even if failing, can contribute to improving scaling-up through the identification of weaknesses.
- The strategies and framework proposed are not prescriptive and have to be seen as a guide only. The fairly limited number of successful scaling-up research cases show no absolute strategies or prioritization of elements.

Figure 6 shows the proposed framework for guiding scaling-up of NRM research. It links chronologically key elements which strengthen the likelihood of successful scaling-up. In general we advocate that scaling-up be considered during the early stages of planning research activities. Table 16 gives a breakdown of key activities at each project stage and provides a set of attributes to be achieved (or aspired to) in the scaling-up process.

The strategic elements, while essentially recommended at the pre-project preparation phase, also have a bearing throughout the project and programme phases. The elements can be used at different entry points in a research implementation process: reviewing ongoing work, as well as assessing finished research projects with existing potentially useful outputs. The framework may also serve as additional material in evaluations of research programmes.

Many of the elements have parallels with any good project design, but are particularly important to emphasize here, as in the past much of the research project was focused on traditional research outputs.

Figure 6 gives an idea of how the different elements, discussed in more detail below, are important for several, if not all, the project phases.

Engaging in policy dialogue on pro-poor development agendas. Research needs to be placed in the context of local, regional and national development agendas, as this helps identify key entry points and major needs. This is ideally done at an early stage so as to shape the overall project design, but can also be done through regular reviews of the project, or raising awareness of results of projects at other development discussion meetings. Engaging in dialogue on local development issues also helps to identify the extent, and importance in potential target groups.

Carrying out situational analysis to identify community, institutional, and environmental enabling and constraining factors to scaling-up. The likelihood of scaling-up will be increased if key constraints as well as opportunities are identified at an early stage. However, all enabling and constraining factors cannot be identified at the outset and so the research activities (project) will need to build in mechanisms to review new issues and plan around them or with them. This is a crucial phase for addressing the real priorities of the target group, as well as for identifying catalysts for scaling-up.

Identifying appropriate research objectives and outputs within development processes to ensure widespread uptake. Rather than identifying outputs and forms of dissemination only at the end of research, these should be discussed at an early stage together with stakeholders and users, and subsequently modified throughout the project. These outputs may include identification of solutions which can be very technical in nature.

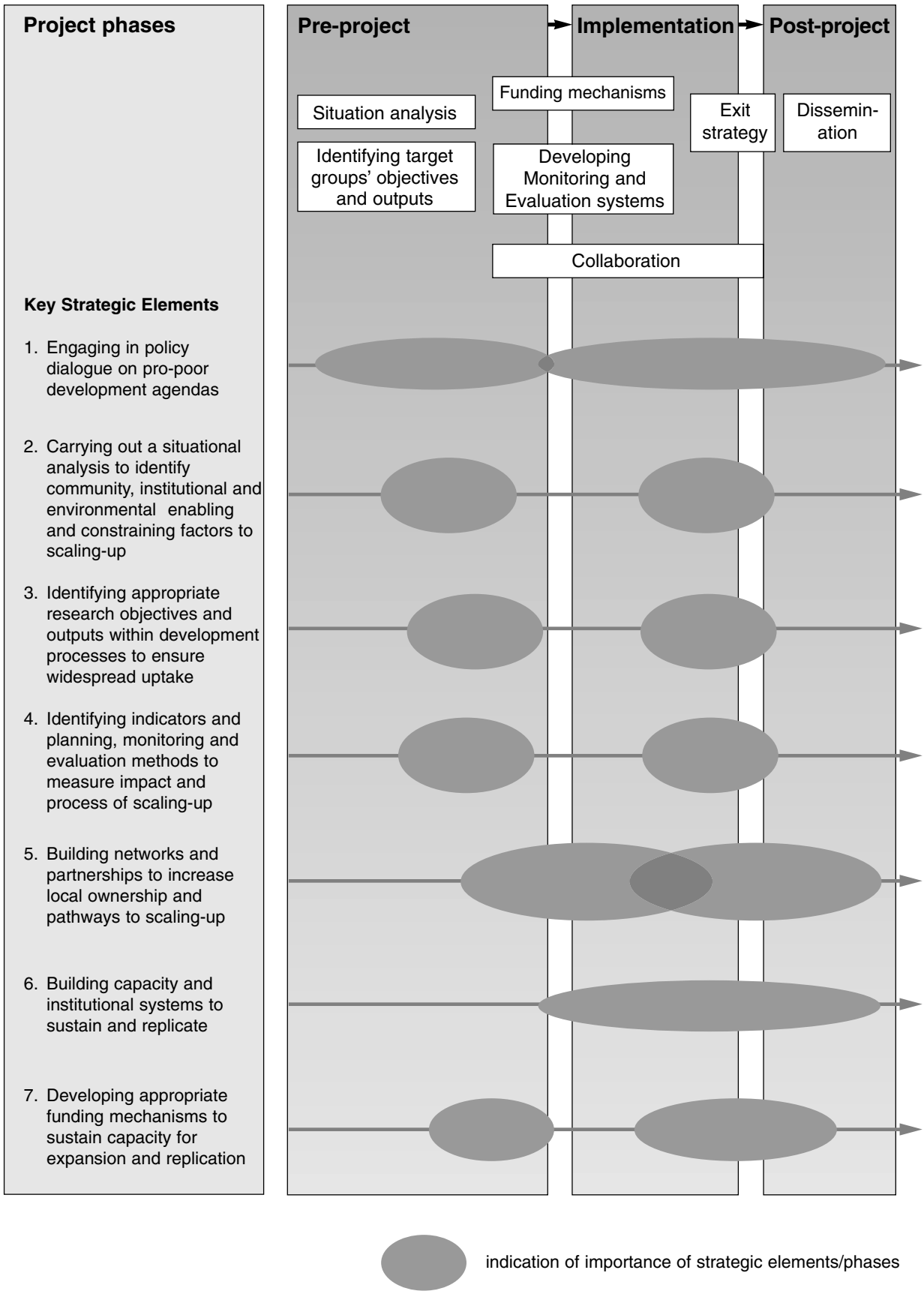

Figure 6 Key strategies for scaling-up NRM research in relation to design process.

Table 16 Activities, strategic elements and attributes of scaling-up processes for NRM research

Project phases	Activities relevant to scaling-up	Strategic elements towards successful scaling-up	Attributes
Pre-project	Situation analysis	Engaging in policy dialogue on pro-poor development agendas	Inclusive and plural
		Identify community, institutional and environmental enabling and constraining factors to scaling-up	Recognize differentiation
		Appraisal of institutional capacity of agencies involved in scaling-up required	
	Identifying target groups Setting objectives and outputs	Identifying appropriate research objectives and outputs within development processes to ensure widespread uptake	Consultative Collegiate
	Developing monitoring and evaluation system	Identify indicators and planning, monitoring and evaluation methods to measure impact and process of scaling-up	Participatory
	Collaboration	Building networks and partnerships to increase local ownership and pathways	Constructivist
	Funding mechanisms	Develop appropriate funding mechanisms to sustain capacity for expansion and replication	Innovatory
Imple-mentation	Capacity-building Institutionalizing	Building capacity and institutional systems to sustain and replicate	Vertical sharing Start early
	Partnership forging Networking	Demand, supply and support actors identified Other resource organizations contribute with products and by building technical capacity	Collegiate Inclusive
	Raising of awareness	Multi-media dissemination of findings	
	Policy dialogue	Aggregate and assess findings from individual projects and derive policy-relevant information	Pro-active
	Monitoring and evaluation and support studies	Central to scaling-up processes in providing evidence to influence policy-makers, in deciding what should be scaled-up and how this might be achieved	Participatory Plural
Post-project	Exit strategy	Concerted action required on a regional level	Concerted
	Dissemination	Should involve the target group as disseminators	Accessible
	Impact assessment	Built upon monitoring and evaluation. Representatives of target group part of assessment team. Technological and livelihoods assessment required	Participatory

Identifying indicators and planning, monitoring and evaluation methods to measure impact and process of scaling-up. Central to the scaling-up processes is deciding what should be scaled-up and how this might be achieved, and providing validated evidence to influence policy-makers. To manage, learn from and gain credibility, methods and measures for assessing pro-poor and NRM impact on different scales need to be elaborated. The intermediate supporting processes and institutional systems to achieve this will also need agreed measures and review mechanisms. Various

participatory methods are vital to ensure open feedback. A major area of this work is identifying cost-effectiveness, so as to be able to work towards it.

Building networks and partnerships to increase local ownership and pathways to scaling-up. In order to achieve the above elements, researchers and their institutions need to develop relationships throughout the process which can further develop into firm partnerships with development and other institutions, there always being a firm link to the grassroots and end-users. Personal relationships also foster direct interest and enthusiasm, increasing the chances of institutionalization and spread of ideas.

Building capacity and institutional systems to sustain and replicate. The capacity to manage learning through doing is critical for scaling-up to evolve and for further opportunities for scaling-up to be continually identified. It is also important, especially in the implementation and exit stages, to take on board new ideas within institutions, especially within communities and government.

Developing appropriate funding mechanisms to sustain capacity for expansion and replication. Maintain flexibility and ensure funding for non-technical activities (local and regional networking, capacity-building, consultations) is in place at the pre-project stage. At the same time one has to begin building ownership through clear shared resource commitments to activities. Seek opportunities for self-sustaining results in research outcomes, or at least mechanisms for reducing costs when expanding, replicating, etc. Take into account the very real dynamics between technologies and wider economic spheres, and the financial constraints facing local and government institutions.

3.3 THE STRATEGIC ELEMENTS FOR SCALING-UP

3.3.1 Engaging in policy dialogue on pro-poor development agendas

Policy dialogue is a crucial element in all project phases. At the pre-project stage, the identification of poverty target groups and wider NRM issues with regional and local development actors, and developing a common vision to guide subsequent activity is essential. Also there can be an initial definition and prioritization of important target groups to guide any future assessment of policy impact. This can be done through:

- identifying development activities that are ongoing
- linking with donor development programmes and country strategies
- identifying local government, NGO and decentralization processes to build on, for example, extension services
- round table discussions that are ongoing (Mesas de Concertacion).

During the implementation and post-project phases, the policy dialogue should emphasize raising awareness and sharing the policy implications of research outcomes. A vertical scaling-up aspect of this is influencing and changing the policy and institutional environment.

NGOs have often adopted a policy advocacy approach but recognize it is not simple and has some potential pitfalls in terms of creating negative reactions, as well as being difficult to assess in terms of impact (BOND, n.d.).

3.3.2 Situational analysis to identify community, institutional, and environmental enabling and constraining factors to scaling-up

Most development projects have situational analyses either in the form of rapid rural assessments, which have been shown to be effective, or within more formal studies or, in the case of smaller projects, in the background analyses of proposals. Often these examine the institutional context and assess aspects of sustainability. However, we believe that it is important to examine explicitly the context for scaling-up, and that it should be done in a participatory manner to ensure that local perspectives are identified.

The above case studies indicate that a careful analysis of enabling and constraining factors to scaling-up carried out at an early stage can assist in identifying key pathways and opportunities. The Whitstable workshop produced lists of enabling and constraining factors in the community and institutions. To what extent these are actually enabling or constraining to scaling-up is very situation-specific. Also the extent to which they can actually be addressed directly will depend on the resources and partnerships available.

What emerges is a broadening of NRM into a complexity and multiplicity of dimensions, levels and disciplines. This is to some extent already recognized inherently in the concept of integrated NRM, but essentially is just as applicable in, for example, a more crop-specific analysis in farming systems research.

Key points to be identified for scaling-up:

Target groups

- Who are the poor, where are they?
- How heterogeneous are they?
- What are their particular socio-economic conditions?
- What are the possible multiple causes of poverty?

Stakeholders

- Who are the potential catalysts ('sparks') for change and facilitation?
- Supporting and constraining institutions in the community and wider (see below)

Socio-economic and community

- What are existing innovations and processes for dissemination?
- In the community who will support and who may lose out?
- What levels of organization and networks are available?
- Capacity of local communities
- Identify the wider livelihood context of NRM and its role for local people
- What are the local and even global market and input issues in relation to specific NRM technologies?
- Peace and order situation

Institutional

- Attitudes such as scepticism or threat to new ideas and systems
- Capacities for participatory methods
- Linkages and communication between different sectors and government departments and civil society
- What are the policies for decentralization, resource tenure, good governance
- Capacities, resources and procedures for change within government

Environment

- What are the bio-geographical boundaries and interrelated ecological systems which

encompass a particular issue or innovation, and how consistent are they with social and institutional boundaries?

This latter aspect is especially important in horizontal scaling-up ('scaling-out' in Harrington *et al.*, 2000). Harrington and others argue that tools such as computational modelling and applications of geographical information systems, in combinations with participatory methods, offer opportunities for pinpointing new geographical areas for scaling-up. These can be then explored through participatory extension processes. While use of these methods for scaling-up has yet to be fully proven, with increasing user-friendliness of software and appropriate training, they may in time become useful tools.

3.3.3 Identifying appropriate research objectives and outputs within development processes to ensure widespread uptake

In parallel and iteratively with the identification of scientific objectives and options, the fit between outputs and context has to be refined, in particular building on wider policy dialogue and development agenda above, and putting it into action. This means recognition of different agendas of research (upstream, policy) and NGOs (development, downstream), sometimes resulting in conflict, but with potential for convergences and collaboration on policy advocacy.

It also means that there is a need to balance more research-oriented outputs with, for example, capacity-building objectives (see below). This can be done by:

- working within extension/development processes, for example, using the participatory extension approach (Hagmann *et al.*, 1998), and developing appropriate dissemination mechanisms, not just dissemination products: at an early stage, one can start exploring the nature of the outputs, based on local appropriateness; past research results can be introduced in the right context through these participatory extension approaches
- working closely with NGOs (see Cooper and Denning, 2000) and farmer organizations, building on local demand and identified issues
- reviewing and shaping outputs should be carried out throughout the process as new stakeholders are identified and more information is gained on the appropriateness of dissemination materials; the Whitstable workshop recommended annual reviews and planning
- simplifying outputs and procedures in scaling-up is a key strategy for effective communication (Pound, 2000). This may mean rationalizing participation activities which involve many stakeholder representatives to key events as these processes are often costly and time consuming.

This means there needs to be flexibility in the expected nature of the final outputs. This may also conflict with incentives for traditional research dissemination (peer-reviewed papers). The rationalizing of participation is something that has to be carefully discussed between research and development partners so as not to lose the key principles behind empowerment.

3.3.4 Monitoring and evaluating impact and process

This should be closely linked to the learning processes emphasized in capacity-building.

The impact goals need to be constantly examined – are we bringing "improved livelihoods, more power to more people, more equitably and more lastingly?"

- Reduction in poverty, of whom, how many and how?
- Farmer measures of impact

- User sustained benefits – how to measure 'empowerment'?
- Process and assets built up in community more important than technology

Intermediate results

- Farmer adoption and adaptation process
- Improved natural resource sustainability
- Improved NRM practices
- Capacity to cope with change, including community organizational systems

Institutional support to scaling-up

- Extensionists' capacity and attitude to learn and support new communities
- Community strength and capacity to continue processes and influence other communities
- More favourable policies
- Institutional capacity
- Funding and sustainability
- Influence over research agenda

Processes during scaling-up

- Partnership dynamics between NGOs, researchers, donors, government and communities
- Assessment of cost-effectiveness at different levels and comparative advantage

It is important to use participatory methods where necessary and applicable to strengthen communities control over process (maintain accountability) and to understand better their needs. It is also important to monitor the relevance of research and link it to key decision-making points. In this regard there are emerging ideas for improving the assessment of impact and relevance of agricultural research, and how it links into key decision-making points (Izac, 1998; Gura and Kreis, 2000).

3.3.5 Networks and partnerships

Networking and partnerships are very important in NRM (see Uphoff, 1998; Borrini-Feyerabend *et al.*, 2000) and for scaling-up. Much work has been carried out on partnership-building that supports scaling-up efforts, such as Borrini-Feyerabend *et al.* (2000), but also work done by NGOs and the private sector, and the CGIAR is attaching much significance to this aspect. The ICRAF, and especially the IIRR, workshops put considerable emphasis on this and the latter provided considerable guidance on building social capital (IIRR, 2000).

It is interesting to note that in the ICRAF workshop conclusions (Cooper and Denning, 2000), it was suggested that ICRAF needs to institutionalize the concept of the research and development continuum and the scaling-up fundamentals (see Table 14). Further, in seeking to meet these challenges, ICRAF recognized that there are different roles to play in achieving each fundamental while recognizing that all of them are critical. So, for example, in addressing technical options ICRAF should lead, while in facilitation, learning and sharing knowledge, successes and failures, it will seek to complement and work with its partners. In terms of enhancing local capacity and policy options on the other hand, ICRAF realizes it has limitations and recognizes the need to reach out to new partners.

Important considerations emerging are:

- while there is considerable overlap between alliance-building and networking, the former is useful to support influential policy dialogue and identify present and potential pathways for vertical scaling-up, and the latter for the exchange of ideas and potential options for horizontal scaling-up
- on a partnership level, to develop working relations and collaboration to implement combined development research activities, initially on an individual project basis, but

eventually this can graduate to a programmatic mode

- accountability, openness, developing a common vision and careful planning in the sharing of resources are important aspects of good partnerships
- it has to be recognized that there are also complexities and difficulties in partnerships, such as unequal relationships, especially with regards to those holding resources and those that do not, and which partner, for example, owns the intellectual property arising from partnerships?
- potential areas for support include how to build good partnerships, what capacities are needed, can these perhaps be obtained from the private sector?
- the terms of collaboration and exit strategies need to be reviewed regularly.

3.3.6 Capacity-building and institutionalization

The analysis of community and institutional constraints can be used as an indication of where institutional capacities have to be strengthened. It is important that capacity-building and institutionalization are planned at an early stage and integrated into the implementation and exit stages. Some of the key issues are described below.

- Community organizational capacity is critical as, for example, self-sustaining farmer to farmer extension processes can be maintained by them (World Bank, n.d.).
- Developing learning systems is important for government staff in particular so they can continue to internalize and adapt processes. Managing and implementing truly participatory processes are particularly important in this.
- Identifying and internalizing procedures, and often simplifying these (emphasized by Esmail, 1997 and Jain in IIRR, 2000).
- Skills for facilitating scaling-up (such as partnership-building and networking) should be fostered among partners and within research institutions.
- Research incentives should be steered towards supporting the above, and not just for the production of peer-reviewed papers and the like. This may well be addressed by a closer integration between research and extension services (Pound, 2000).
- Link to and support wider policy changes (see Box 5).

Box 5 Fostering the policy and institutional environment

World Bank (2000) on scaling-up community-driven development (parallels to demand-driven research) by contributing to policy and institutional environment.

- Link with Country Development Frameworks of World Bank (Country Development Strategy in DFID's case).
- Link with decentralization: supporting and strengthening reform at local level and strengthening role of community organizations to tap into this.
- Sound sector policies: consistency and financial sustainability mechanisms, laws supportive of community management, etc. Clear institutional arrangements; incentives for national agencies to address community demands; feedback to address accountability.
- Ensuring private sector supply of goods and services are accessible to communities through removing obstacles to fair competition.

3.3.7 Funding and sustainability mechanisms

Closely related to the above institutionalization are the sustainability mechanisms developed, i.e. identifying cost-effective procedures and self-sustaining institutions which can continue to replicate, innovate, adapt and process new knowledge. Suggestions have included increased research funding through private means. However, there should be caution here, as the management of more public natural resource goods, and subsidies to more marginal and scattered target groups will have to be sustained through public funds (Beynon, 1996). In working towards this situation, however, some funding considerations can be highlighted.

Funding and partnerships

- There should be a careful assessment of what partners can bring in terms of counterpart funds.
- The reality is that funds are often in short supply by partners, making the identification of broader assessments of local counterparts 'in kind' (such as time, personnel, local materials, etc.) very important in terms of contributions of otherwise resource-limited organizations.
- Competitive funds are a strong mechanism for bringing stakeholders together if collaboration is made a requirement of obtaining funding (see SSMP case study in Section 2).

Budgeting

- Budget lines should be firmly fixed in the early stages.
- Budgeting and funding should ideally follow an open annual system of review (see monitoring and evaluation below).

Funding networking and consultations

- There should be an allocation of funds for the pre-project stage for consultations, etc.
- Networking and ongoing reviews fora take time and need to be costed.
- Funds for capacity-building, in particular for community organizations, should be an important part of NRM research projects.

There are implications to the above which can be summarized by quoting Martin and Sherington (1997): "Research institutions have been slow to develop and approve mechanisms for improving client representation in research planning and budgetary decisions, or to relinquish control of part of their research budget to allow commissioning by farmers and other clients. If participatory research is to be institutionalized, then organizational innovations are needed to implement these decisions..."

4 Implications for research

This section aims to provide an answer to the question stated in Section 1.1. The discussion is focused on the implications for research and is divided into two parts. In the first section we respond to the question "What are the appropriate strategies and mechanisms for the pro-poor scaling-up of NRM research (products and processes). In the second part we respond to "What contribution can research make for pro-poor scaling-up in terms of responding to current knowledge gaps?"

4.1 APPROPRIATE SCALING-UP STRATEGIES AND MECHANISMS

The information obtained during the review process shows clearly that research has in the past focused mainly on horizontal scaling-up, relying in the first place on documentary means to achieve this. Furthermore from a research perspective, scaling-up seemed to be considered a post-project activity with little or no attention paid to it during the research design phase. Many research projects remain 'islands' within the local context and have, therefore, little chance of being successfully scaled-up.

The strategic framework developed in Section 3 is meant to support researchers and research programme managers to bring scaling-up earlier in the project design phase. However, its adoption has implications for research programmes and institutions which are described below in more detail.

4.1.1 Implications for NRSP

One of the key strategic elements identified for successful scaling-up is engagement in policy dialogue (see Section 3.3.1). This means that NRM research will have to be assessed much more carefully in terms of its fit within, and its contribution to local and national development processes in order to be able to respond to local demand.

- This would imply that DFID takes the programmatic approach to development and research further and links NRSP directly into DFID regional development programmes.
- Taking this a step further would be to seek co-ordination with other donors and create regional research funds which can be accessed to support regional concerted development actions.
- Being linked into development actions would further recognize the need for longer-term frameworks in NRM research.
- A demand-led approach requires the financing of a pre-project phase which will allow researchers to identify demand, potential stakeholders, existing capacities, etc. Without the allocation of resources to this phase, being 'demand-led' will remain mere rhetoric in project documents.
- Regional representation by the DFID research programmes would help to promote better identification of demand, forge links with uptake pathways, and monitor post-project sustainability.

Another strategic element of the scaling-up framework is the identification of appropriate research objectives and outputs (see Section 3.3.3) In order to achieve this, project calls (project proposal submissions) have to be addressed towards institutions and organizations in the target regions to strengthen the implementation of a demand-led approach.

- They should not be limited to traditional research organizations (NARS) but to a wider range of NRM stakeholders and decision-makers, such as NGOs, CBOs, grassroots initiatives and private sector agencies.
- Decentralized competitive funds are an opportunity to broaden the range of stakeholders/sectors involved (see SSMP case in Section 2.2).
- Support to regional/national competitive funds for research and extension (e.g. Bolivia, Ecuador, Kenya, etc.) is another mechanism to foster vertical scaling-up.

Capacity-building and institutionalization are more strategic elements of the scaling-up framework (see Section 3.3.6). Shifting the emphasis of research to partners in developing countries may require the development of regional capacities in demand-led approaches, sustainable livelihoods and scaling-up processes.

- 'Cherry picking' regional key research organizations based on their enhanced capacities will limit the potential of scaling-up.
- This implies a shift in the balance of funding from technology generation to capacity-building.

It is important for programmes to recognize the need for partnerships (see Section 3.3.5). Fostering long-term partnerships between institutions with complementary research and development agendas will lead to regional capacity development and to a more efficient use of resources.

- NRSP should seek to integrate their research programme with the CGIAR system, as the review has shown that there is a clear overlap in research foci. Scaling-up in NRM is a key area of interest for CGIAR.
- Research budgeting may have to allow for resources for regional partnership-building and networking.

The sustainable implementation of the above strategies in the current situation of decreasing funds will require access to more innovative funding mechanisms. The relevance of cost-effective procedures and funding mechanisms was a key issue revealed by the case study analysis and the Whitstable workshop. Furthermore it forms one of the strategic elements of the scaling-up framework (see Section 3.3.7).

- Private–public partnerships are a key strategy for the sustainable implementation of research partnerships beyond the project/programme implementation phase, but in the context of public goods (NRM) and marginalized groups, there will be a continuous need for public resources.

NRSP has to establish a set of indicators to monitor and evaluate the process and impact of scaling-up. Only with a rigorous monitoring and evaluation process can scaling-up be confidently moved from rhetoric into practice. These indicators have to be regionally adapted and agreed upon with regional partners. They need to focus especially on cost-effectiveness and livelihood impact on different scales.

4.4.2 Implications for researchers and research institutions

A key area for researchers and research institutions is the establishment of functioning partnerships with in-country agencies. The case study analysis has shown the importance of establishing partnerships at an early stage of project development (see Section

2.2), and during the Whitstable workshop participants agreed that too often partnership development is a neglected area in project implementation. In order to achieve functioning partnerships the following need to be considered:

- researchers have to negotiate in the pre-project phase the clear responsibilities and outputs to be achieved with each partner
- multidisciplinary partnerships have to be taken more seriously and communication strategies between the different disciplines involved have to be in place from an early stage
- the involvement of social scientists in NRM research teams is necessary to strengthen the people-centered approach
- researchers should be encouraged and given incentives to focus on more long-term partnership-based initiatives through their research institutions and DFID research programmes.

In many circumstances and for several reasons (short time-span between project call and concept note submission, lack of communication in local language, etc.), the demand-led approach has remained the rhetoric of project documents.

- Participatory approaches with a strong emphasis on learning processes and openness to adapt to new situations are a key strategy for successful scaling-up.
- NRM researchers have to encompass concerns beyond technologies: the recognition of other key issues for sustainable livelihoods is necessary for the target group's ability to expand and replicate a successful technology, and to ensure a wider pro-poor relevance of research outputs.
- The focus on wider (non-technical) issues has to be recognized as a valuable research output by the research.
- Researchers should be more innovative in the use of alternative media to disseminate research outputs. Documentary types of dissemination addressed to the academic community limits the potential for scaling-up.
- This might require capacity development in specific areas, such as participatory approaches and communication strategies.

The lack of an adequate monitoring and evaluation system for scaling-up was raised as a key issue during the Whitstable workshop. Researchers and their institutions have to become accountable for their contribution to scaling-up. This requires the identification of indicators which show research effectiveness in terms of impact. A multiple stakeholder partnership requires performance monitoring of the process in order to identify the contribution of the different parties (especially researchers).

4.2 POTENTIAL RESEARCH CONTRIBUTIONS TO CURRENT KNOWLEDGE GAPS

This section provides an overview of the issues where research can make a significant contribution to the further development and implementation of appropriate scaling-up strategies. The issues arose partly out of the Whitstable workshop, the literature review and the conclusions reached by other DFID research programme studies.

One important area for future research is the monitoring and evaluation approach to scaling-up. The review has shown that most research projects did not consider the scaling-up aspect during project design or implementation and, therefore, had no monitoring and evaluation system for scaling-up in place. Methods and indicators have to be developed for:

- the identification of target groups (where poverty and dependence on NRM coincide)
- the understanding of demands/needs of the poor

- the assessment of scaling-up impact on livelihoods
- the measurement of cost-effectiveness of NRM scaling-up efforts at different levels.

Another key area is partnership development. The need for partnerships is widely recognized and often emphasized in project documents. However, successful implementation seems to encounter several constraints. Research can contribute to the following:

- identifying criteria for good partnerships appropriate to NRM research
- analysing the issues around intellectual property rights and partnerships
- identifying suitable exit strategies for NRM research.

Another important area to which research can contribute is the use of innovative media for the scaling-up of research outputs. The review showed that past and current research projects are heavily biased towards documentary modes of information transfer, which are not accessible for a range of key stakeholders. Areas to look at include:

- analysis of patterns of information use in decision-making by the target group
- identification of effective mechanisms accessible to, and used by the target groups (e.g. for poor households in specific production systems, taking into account gender constraints).

The review findings point out the specific gap between research initiatives and policy dialogue. Information transfer across different stakeholder groups remains problematic and, therefore, mechanisms are needed which improve policy dialogue. A specific question to consider is: how to harness past research findings from PRA type work for policy advocacy?

This list is not comprehensive nor did we have the opportunity for detailed analysis of the current situation for all these issues. What became clear through the literature review is that there is scope to learn from other sectors as many of these issues are not specific to NRM, and it is possible that several of these points can be at least partially answered by other disciplines. Therefore, it is important for DFID to encourage a cross-sectoral systematization initiative for scaling-up before addressing these specific issues in its research programmes.

References

BEYNON, J. (1996) Financing of agricultural research and extension for smallholder farmers in sub-Saharan Africa. *Natural Resource Perspectives*, No. 15. London: Overseas Development Institute (ODI). (http://www.oneworld.org/odi/) [Summary of findings from larger study.]

BIGGS, S. D. (1989) In: *Farmers Participatory Research: Rhetoric and Reality*. Okali, C., Sumberg, J. and Farrington, J. (eds). London: Intermediate Technology Publications

BIGGS, S. D. (1995) Farming systems research and rural poverty: relationship between context and content. *Agricultural Systems*, **47**: 161–174.

BOND (no date) The what and why of advocacy. *BOND Guidance Note Series* 3. British Overseas NGOs for Development. (http://wwww.bond.org.uk/advocacy/guidwhatandwhy.html)

BORRINI-FEYERABEND, G., FARVAR, M. T., NGUINGUIRI, J. C. and NDANGANG, V. A. (2000) *Co-management of Natural Resources: Organizing, Negotiating and Learning-by-Doing*. Heidelberg: GTZ/The World Conservation Union (IUCN)/Kasparek Verlag. (http://nrm.massey.ac.nz/changelinks/cmnr.html)

CGIAR (2000) *Integrated Natural Resource Management Research in the CGIAR*. A brief report on the INRM Workshop held in Penang, Malaysia, 21–25 August 2000. Washington: Consultative Group for International Agricultural Research. (http://www.inrm.cgiar.org/Workshop2000/ – summary in PDF, 1st and 2nd drafts.)

CONWAY, G. (1997) *The Doubly Green Revolution: Food for All in the 21st Century*. London: Penguin Books.

COOPER, P. J. M. and DENNING, G. L. (2000) *Scaling-up the Impact of Agroforestry Research. Report on the Agroforestry Dissemination Workshop, 14–15 September 1999*. Nairobi: International Centre for Research in Agroforestry (ICRAF).

DFID (1997) *White Paper: Eliminating World Poverty – A Challenge for the 21st Century*. London: Department for International Development.

EDWARDS, M. and HULME, D. (eds) (1992) *Making a Difference: NGOs and Development in a Changing World*. London: Earthscan Publications.

EDWARDS, M. and HULME, D. (1998) Too close for comfort? The impact of official aid on non-governmental organizations. *Current Issues in Comparative Education*, **1**(1). (http://www.tc.columbia.edu/cice/vol01nr1/medhart1.htm). [Reproduced from *World Development*, **24**: 961–973 (1996).]

ELLIS-JONES, J., MASON, T. and KEATINGE, D. (eds) (1999) Conference on Poverty, Rural Livelihoods and Land Husbandry in Hillside Environments (1999). *Mountain Research and Development*, **19**(4): 364–368.

ESMAIL, T. (1997) *Designing and Scaling-up Productive Natural Resource Management Programs: Decentralization and Institutions for Collective Action*. Washington DC: World Bank, Rural Development Department. (http://www.fao.org/waicent/faoinfo/sustdev/RODirect/Rofo0036.htm)

FARRINGTON, J. and BOYD, C. (1997) Scaling-up the impact of participatory management of common pool resources. *Development Policy Review*, 15.

FARRINGTON, J. and LOBO, (1997) Scaling-up participatory watershed development in India: The case of the Indo-German Watershed Development Programme (IGWDP). Number 17.
(http://www.odi.org.uk/nrp/index.html)

GFAR (1999) *Activities of the NARS Secretariat – 1999–2000, Implementing the Programme of Work. Towards a Global Agricultural Research System.* Rome: Food and Agriculture Organization of the United Nations, Global Forum for Agricultural Research.
(http://www.egfar.org/docs/english/nars0003.htm)

GFAR (2000) *GFAR-2000 Conference, Dresden, Germany, 21–23 May 2000: Highlights and Follow-up Action.* Rome: Food and Agriculture Organization of the United Nations, Global Forum for Agricultural Research.
(http://www.iao.florence.it/forum/documenti/gfar2000conference.htm and
http://wwww.fao.org/NARS)

GÜNDEL, S. and HANCOCK, J. (2001) Scaling-up Strategies for Pilot Research Experiences, 23–25 January 2001, Whitstable, UK. Chatham, UK: Natural Resources Institute (NRI). (unpublished report)

GURA, S. and GUNDULA, K. (2000) *ECART/ASARECA/CTA Workshop on Impact Assessment of Agricultural Research in Eastern and Central Africa.* Esborn: GTZ.

HAGMANN, J. with CHUMA, E., MURWIRA, K. and CONNOLLY, M. (1998) *Learning Together Through Participatory Extension, A Guide to an Approach Developed in Zimbabwe.* AGRITEX/GTZ/ITZ. [Also summary in Cooper and Denning (1999).]

HAGMANN, J. with CHUMA, E., MURWIRA, K. and CONNOLLY, M. (1999) Putting process into practice: operationalizing participatory extension. *AgREN Network Paper*, No. 94. London: Overseas Development Institute (ODI).
(http://www.odi.org.uk/agren/papers/hagmann.html)

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, Imperial College at Wye, UK.*

HARRINGTON, L., WHITE, J., GRACE, P., HODSON, D., HARTKAMP, D., VAUGHAN, K. and MESNER, C. (2000) *Taking it Higher: Thoughts on Scaling-up and Scaling out within Problem Solving Approaches to Research on INRM.*
(http://www.inrm.cgiar.org/Workshop2000/abstract/LarryHarrington/fullLHarrington.htm)

IIED (2000) *Institutionalizing Participatory Approaches and Processes for Natural Resources Management – A Collaborative Research Project.* London: International Institute for Environment and Development.
(http://www.iied.org/agri/ipa.html)

IIRR (2000) *Going to Scale: Can We Bring More Benefits to More People, More Quickly?* Silang, Cavite, Philippines: International Institute of Rural Reconstruction.

IMPERATO, I. and RUSTER, J. (1999) How does the program consider scaling-up? The Policy Level excerpt from Participation in Upgrading and Services for the Urban Poor. In: *Upgrading Urban Communities*. Washington DC: World Bank.
(http://web.mit.edu/urbanupgrading/)

IZAC, A.-M. (1998) *Assessing the Impact of Research in Natural Resources Management. Synthesis of an International Workshop, 27–29 April 1998, Nairobi, Kenya.* Nairobi: International Centre for Research in Agroforestry (ICRAF).

JAIN, P. (2000) Managing fast expansion of micro-credit programs: lessons from Association for Social Advancement (ASA), Bangladesh. In: *Going to Scale: Can We Bring More Benefits to More People, More Quickly*? Silang, Cavite, Philippines: International Institute of Rural Reconstruction.

KING, F. (1998) *Scaling-up Forum Proceedings. Scaling-up Knowledge Based Forum – and Invitational Conference*. Proceedings Document. *National Speciality in School Change*. (http://www.nwrel.org/scpd/natspec/scaleupconf.html)

LOVELL, C., MANDONDO, A. and MORIARTY, P. (2000) *Scaling Issues in Integrated Natural Resources Management*. (http://www.inrm.cgiar.org/Workshop2000/abstract/Lovell/fullchrislovell.html)

MALVICINI, P. and JACKSON, J. (2000) Emerging at scale: breaking the star-case monopoly. In: *Going to Scale: Can We Bring More Benefits to More People, More Quickly*? Silang, Cavite, Philippines: International Institute of Rural Reconstruction.

MARTIN, A. and SHERINGTON, J. (1997) Participatory research methods – implementation, effectiveness and institutional context. *Agricultural Systems*, **55**(2): 195–216.

MAX LOCK CENTRE (1998) *Concept Notes from Charney Manor Conference, Oxfordshire*. (http://www.wmin.ac.uk/%7Emaxlockc/concept.html)

NRSP (2000) *Research Highlights 1999–2000, Poverty Reduction Through Partnerships in Natural Resources Research*. HTS Development Ltd.

OUDENHOVEN, N. and WAZIR, R. (no date) Replocating social programmes –approaches, strategies and conceptual issues. *Management of Social Transformation, Discussion Paper Series*, No. 18. Paris: UNESCO. (www.unesco.org/most/dsp18.htm)

PIERCE, S. D. (no date) *Grassroots Development and the Issue of Scale: A Colombian Case*. The Inter-American Foundation. (http://www.iaf.gov/jrnl19-2/pierce.htm)

POUND, B. (2000) The "uptake environment". Paper presented at the *2nd FPR Forum organized by FARM-Africa, Awassa, Ethiopia, 29 June–1 July 2000*.

RASMUSSON, M., BASHIR, N. and KEITH, N. (eds) (1998) *Community-based Approaches to Child Health: Basics Experience to Date*. (http://www.basics.org/Publications/abs/abs-(bach.html)

SALEQUE, Md. A. (1999) *Scaling-up: Critical Factors in Leadership, Management, Human Resource Development and Institution Building in going from Pilot Project to Large Scale Implementation: The BRAC Poultry Model in Bangladesh. Poultry as Tool in Poverty Eradication and Promotion of Gender Equality – Proceedings of a Workshop*. (http://www.husdyr.kvl.dk/htm/php/tune99/5-Saleque.htm)

SANE (no date) *Scaling-up Successful Sustainable Agriculture Initiatives, A Conceptual Framework for Latin America*. (http://www.cnr.berkeley.edu/agroeco3/sane/)

SAYWELL, D. and COTTON, A. (2000) *Spreading the Word – Practical Guidelines for Research Dissemination Strategies*. Engineering Knowledge and Research Programme, WEDC, UK.

SCHMIDT, P., STIEFEL, J. and HURLIMANN, M. (1997) *Extension of Complex Issues – Success Factors in Integrated Pest Management*. Swiss Centre for Agricultural Extension.

SCOONES, I. and THOMPSON, J. (1994) *Beyond Farmer First: Rural People's Knowledge, Agricultural Research and Extension Practice*. London: International Institute for Environment and Development/Intermediate Technology Publications.

UPHOFF, N. T. (1998) Community-based natural resource management: connecting micro and macro processes, and people with their

environments. Paper presented at the *International Workshop on Community-Based Natural Resource Management, World Bank, Washington, DC, 10–14 May 1998.*

UVIN, P. (no date) *Scaling-up the Grassroots – An Annotated Bibliography.* (http://www.brown.edu/Departments/World_Hunger_Program/index.html)

UVIN, P., JAIN, P. S. and BROWN, L. D. (2000) Scaling-up NGO programs in India: strategies and debates. *IDR Reports: A Continuing Series of Occasional Papers*, **16**(6). (www.jsi.com/idr)

UVIN, P. and MILLER, D. (no date) *Scaling-up: Thinking Through the Issues.* http://www.brown.edu/Departmentsprogram/hungerweb/WHP/SCALINGU.html

WILSON, M. J. (2000) 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, Imperial College at Wye, UK.* Hainsworth, S.D. and Eden-Green S.J. (eds).

WORLD BANK (2000) Community Driven Development, Participation. Draft report. (http://www.worldbank.org/participation/CDDprinciples.htm)

WORLD BANK (no date) Practice pointers in enabling the poor to participate, intermediary NGOs. In: *The World Bank Participation Sourcebook.* Washington DC: World Bank. (http://worldbank.org/wbi/sourcebook/sb0404t.htm)

SWOT analysis of the pre-project phase: SA/FM Bolivia

SWOT	Situation analysis	Identification of target groups	Setting objectives and proposing outputs	Collaboration	Setting up monitoring and evaluation	Funding
Strengths	Based on collaborating institutions' knowledge.	Based on collaborating institutions' knowledge.	Convergence sought between objectives of funding agencies and collaborating institutions.	Wide consultation with research institutes and NGOs in region. Attempt to develop coherence.	Targets for outputs and dissemination set and achievement monitored.	Agreed at outset.
Weaknesses	Little engagement with farmer perceptions.	By location rather than appreciation of differentiation among farmers in target area.	Little engagement with farmer perceptions.		Monitoring by technical specialists not by reference group including representatives of target group.	
Opportunities	Contribute to and develop coherence of research interventions.	To focus on poorest during early stages of project.	Contribute to and develop coherence of research interventions. To focus on poorest during early stages of project.	To enhance farmer group capacity by involvement in innovation development and technology validation.	To enhance farmer group capacity by involvement in monitoring and evaluation.	
Threats	Technological outputs of little usefulness to target group.	To work only with those farmers able to participate and thereby produce outputs of limited usefulness to poorest.	Technological outputs of little usefulness to target group. To work only with those farmers able to participate and thereby produce outputs of limited usefulness to poorest.			

SWOT analysis of the pre-project phase SSMP Nepal,

SWOT	Situation analysis	Identification of target groups	Setting objectives and defining outputs	Collaboration	Setting up monitoring and evaluation	Funding
Strengths	Target areas well prescribed.	Explicitly inclusive of women farmers. Broad range of collaborating institutions[1] (NGOs, government organizations, etc.).	At programme level, set by SSMP but can be responsive to demands from project proposors. Competitive mechanisms allow best proposals to be identified.	Collaboration between collaborating institutions can be facilitated by SSMP.		
Weaknesses	Dependent upon existing information.	Reliant upon collaborating institutions.	SSMP not a project implementer, therefore dependent on effectiveness of collaborating institutions Reliant upon collaborating institutions			
Opportunities	Respond to developing situations.	Evaluate uptake and impact by different target groups.	To develop objectives from evaluation of projects. Evaluate uptake and impact of different outputs.			
Threats		To only address those groups with ability to attract/propose projects.	Programme duration not long enough to learn lessons on transforming objectives into impact.			

[1]Collaborating institutions propose and implement extension projects to the SSMP competitive fund.

SWOT analysis of the implementation phase: SA/FMBolivia

SWOT	Capacity-building	Support studies	Partnership forging	Networking	Policy dialogue	Raising awareness	Institutional-ization	Monitoring and evaluation
Strengths	NGO/GO partner training.	None mentioned	Planning phase included partner identification.	Project initiated regional adaptive research network.	Outputs made available to diverse stakeholders.	Multi-media and format approach to dissemination of outputs.	Participatory research methods tested and documented. Collaborating institutions' staff trained.	Monitoring and evaluation involved project staff.
Weaknesses	Not seen as an RNRRS[2] function and given insufficient emphasis.		Target group not represented in partners identified.	Target group not represented in partners identified.	No direct policy influence sought. Technical rather than policy-relevant outputs.	Target group not involved in dissemination of findings.	Processes not evaluated.	Monitoring and evaluation by project leader and technical support staff. Target group not included.
Opportunities	Establish *in situ* capacity to enable post-project impact (farmers and NGO/govern-ment organizations' staff).		Integrate research stakeholders and others to enable appropriation of outputs.	Monitor progress of project through reference group.	Translate farmer evaluations of technologies into policy-relevant information for systems development.	Farmer-to-farmer and farmer to policy-maker, etc., contacts.	Comparisons between project developed and conventional and methods for achieving institutions' objectives.	
Threats	Discontinuity of collaborating institutions' staff.		Attempt to address too many or conflicting agendas.					

[2]RNRRS DFID's Renewable Natural Resources Research Strategy.

SWOT example of implementation phase: PFI East Africa

SWOT	Capacity-building	Support studies	Partnership forging	Networking	Policy dialogue	Raising awareness	Institutional-ization	Monitoring and evaluation
Strengths	Seen as corner-stone (and continual) process. Re-orientation of collaborating institutions' staff to new roles.	Responsive to perceived needs as project develops.	Different stakeholders seen as contributors to initiative. Multidisciplinary approach sought.	Horizontal and vertical linkages sought in networks. Timely investment for scaling-up.	Identified as an important strategy towards scaling-up. Ministry of Agriculture staff involved in initiative workshops.	Emphasis on publicizing the initiative. Budget available.	Appropriation of the approach by a wide range of collaborating institutions is the ultimate objective. Policy change recognized as necessary.	Recognized as a mutual learning process where responsibilities for data and information collection are shared.
Weaknesses		Involvement of target group not clear.	Sustainability of co-ordination.		Divergence between initiative and government interests.		Continuity of funding required for medium to long term.	Being developed as initiative proceeds. Planning weak.
Opportunities	Assess appropriation and sustainability of new roles.	Provide sound basis for evaluation and hence establish benefits of new methodology.	Fully integrate farmer innovators into processes of technology development.	Fully integrate farmer innovators into processes of technology development.	'Lobbying' on the basis of convincing evidence of initiative's achievements.	Contribute to interest in wider audience of potential collaborating institutions.	Convince on the basis of results.	Provide the information required for lobbying and achieving policy changes.
Threats	Collaborating institutions revert back to conventional mode of working after project.	Becoming side-tracked and dispersal of funds away from main objectives.	Uneasy and unstable alliances.	"Big net and little catch."	Possible conflicts of interest in policy analysis work.		Continuity of policy agenda and objectives of principal collaborating institutions.	

Acronyms

ASA	Association for Social Advancement
BRAC	formerly Bangladesh Rural Advancement
CBO	community-based organizations
CDD	Convention to Combat Desertification
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Centre for Tropical Agriculture
CPP	Crop Protection Programme
DFID	Department for International Development
ENKAR	Engineering Knowledge and Research Programme
FSR	farming systems research
GFAR	Global Forum for Agricultural Research
ICRAF	International Centre for Research in Agroforestry
IIRR	International Institute for Rural Reconstruction
INRM	integrated natural resource management
LPP	Livestock Production Programme
NARS	national agricultural research system
NGO	non-governmental organization
NRI	Natural Resources Institute
NRM	natural resources management
NRSP	Natural Resources Systems Programme
PFI	Promoting Farmer Innovation
RNRRS	Renewable Natural Resources Research Strategy
SA/FM	Sustainable Agriculture at Forest Margins, Bolivia
SANE	Sustainable Agriculture Networking and Extension
SSMP	Sustainable Soil Management Programme, Nepal
SWOT	strengths, weaknesses, opportunities, threats
UNDP	United Nations Development Programme