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Review of NRSP soil research in the context of sustainable livelihoods for the rural and urban poor.

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CG Consultative Group (on International Agricultural Research)
CGIAR Consultative Group on International Agricultural Research
CIMMYT International Maize and Wheat Improvement Centre
DFID Department for International Development, UK
FSR Farming Systems Research
FTR Final Technical Report
GIS Geographical Information Systems
IACR Institute of Arable Crops Research
IFPRI International Food Policy Research Institute
ITK Indigenous Technical Knowledge
NARS National Agricultural Research System/s
NGO Non Governmental Organisation
NR Natural Resources
NRI Natural Resources Institute
NRSP Natural Resources Systems Programme
ODA Overseas Development Administration
PRA Participatory Rural Appraisal
SL Sustainable Livelihoods
SLA Sustainable Livelihoods Approach
Soc Dev Social Development
TOR Terms of Reference
UK United Kingdom

1. REVIEW CONTEXT

1.1 Natural Resources Research in the context of DFID's objectives.

We begin by setting this review within the recent history of DFID funding to natural resources research. This history highlights changes of emphasis in the research strategy which were broadly supportive of the Sustainable Livelihoods (SL) approach introduced by DFID in 1997. In 1989, after many years of government funding to research in the tropics, the National Resources Division of the Overseas Development Administration (ODA) launched a Renewable Natural Resources Research Strategy (RNRRS). This strategy defined strategic research priorities on commodities and cross-cutting issues of regional significance. During a programme review of this strategy in 1993, concerns were raised about uptake and impact of the strategic research commissioned, and a requirement was introduced that more funds should be expended on adaptive location specific research (Anon, 1994). A task group was formed which applied team-up and logical framework methodology to produce a document, widely referred to as the "Yellow Brick" within research management circles. The Yellow Brick outlined substantial revisions to the RNRRS orientation and management in the context of a 10 year research strategy, 1995-2005 (Anon, 1994). This includes rational and expected orientation and outputs, and introduces the thinking behind the Natural Resources Systems Programme (NRSP) which was established at this time. The RNRRS emphasises demand-led research projects that respond to clearly specified groups of beneficiaries, to address identified constraints to the sustainable management and development of renewable natural resources. The research is to be conducted within a defined geographical framework (specific target countries are nominated) and informed by agro-ecological zonation. Specific production systems form the basis for planning and present priorities for most of the research programmes. While the main focus in the Yellow Brick is on demand-led strategic research within a production systems context, a provision is also made for policy research (through the Policy Research Initiative) and for adaptive research, adapting strategic results to location-specific problems.

Emphasis on developmental impact is clear in the overall goal: "poverty reduced, economic growth and reform promoted, national environmental problems mitigated" (Annon, 1994, p. 16). Five developmental objectives elaborate this goal:

- Better management and conservation of RNR
- Improved food security
- Economic growth, increased employment or income generation
- Poverty alleviation, and
- Environmental protection (Ibid. p. 4).

In 1997, the change of government saw the formation of the Department for International Development (DFID) in place of ODA and the 1997 White Paper on International Development. The concept of Sustainable Livelihoods was introduced in the 1997 White Paper that outlined the British Government's commitment to poverty eradication. The White Paper acknowledges that poverty is still disproportionately a rural phenomenon, and that the livelihoods of the rural poor must be improved if the international targets on poverty reduction are to be achieved. The sustainable livelihoods approach was formally launched in 1998, at a conference of DFID's Natural Resource Advisors of the Rural Livelihoods and Environment

Division (formerly the Natural Resources Division). DFID research programme managers have subsequently used various means to highlight the significance of the sustainable livelihoods approach in relation to bringing research results to bear on poverty eradication. This includes background information on web sites, introductions to annual reports, topical slots in workshops and through emphasis in calls for research proposals.

1.2 Natural Resources Systems Programme

The RNRRS is implemented through five strategic areas. The systems strategy comprises the Natural Resources Systems Programme (NRSP) which is sub-divided along the lines of production systems (Table 1). Of the RNRRS research programmes, the NRSP is the most all-embracing in terms of research topics, and emphasises many of the same elements of good practice associated with the sustainable livelihoods approach (Ashley & Carney, 1999). A holistic and practical systems orientation is encouraged. "Constraints to sustainable use and optimum production in the RNR sector as a whole are many, and demands for systems-based approaches in research and development clearly emerge." (Anon, 1994 p 43). Impact orientation is suggested by the added weight given to adaptive research; "it is envisaged that most NRSP activities will be implemented at the adaptive end of the research spectrum" (Anon, 1994. p 43). Moreover, there is recognition of vulnerability and the potential role of agricultural technology in reducing risk: "an underlying theme of the NRSP is to reduce risk in target areas through diversification of coping strategies" (ibid). The importance attached to environmental and socio-economic sustainability (key elements in SLA) is reflected in the emphasis on soil fertility, which is (by assumption) linked to productivity, and the capacity of poorer households to feed themselves and also produce crops for sale. Soil fertility thus features in most of the log-frames developed for each of the NRSP programme areas, indicating its perceived importance as a constraint (Table 1). The research projects reviewed in this study were commissioned in this context, spanning the first five production systems listed in Table 1. In addition programme development projects were also reviewed.

Table 1: Production Systems for the Natural Resources Systems Programme and extent to which soil fertility was emphasised in each

PRODUCTION SYSTEM	Purpose level	Output level	OVI level
High Potential systems	Yes	Yes	Yes
Hillside systems	Yes	Yes	Yes
Peri-urban interface	Yes (recycling of urban waste)	Yes	Yes
Forest/Agriculture interface	No	Yes	Yes
Semi-arid systems	No	Yes	Yes
Land-water interface	No	No	Yield sustained

1.3 Underlying assumptions

It is important, for the review later of poverty orientation and impact in these projects, to draw attention to some underlying assumptions, which appear to have shaped the Yellow Brick, the NRSP and the formulation of projects commissioned by it.

Productivity increase equals poverty reduction
This assumption comes across clearly in the logical frameworks for the various programmes, including that of the NRSP. Poverty alleviation is a strategic RNRRS goal, but not mentioned at goal, purpose or output level, in the systems programme log-frames. These log-frames highlight increasing or sustaining productivity often in relation to soil fertility; the logical assumption is that this will reduce poverty. This may explain the absence of evidence linking research outputs to poverty reduction in nearly all of the projects we reviewed.

Research domains
The idea of research domains, homogenous areas across which strategic research results will be applicable, is implicit in the design of the NRSP. The concepts of strategic and adaptive research, the identification of distinct production systems and the expectations relating to technology uptake rest upon an underlying assumption of research domains. Strategic research promises to address problems that are not just "location-specific" but ones that occur over a widespread area affecting many potential beneficiaries. Adaptive research implies that technology developed to address strategic problems can be adapted to various local conditions. The production systems identified in the RNRRS are assumed to be sufficiently homogenous for the purposes of developing strategic research objectives. The underlying assumption, common to most publicly funded agricultural research, is that uptake is expected to take place within production systems or domains, when uptake agencies have been provided with the requisite information and products. The "green revolution" in the irrigated production systems of Asia and the Middle East is a commonly cited example of this assumption working out in practice.

Target countries are representative and have uptake capacity
A related assumption is that the countries identified as locations for research were selected because they contained areas which were representative of the identified production systems. A further assumption is that uptake can potentially be promoted and undertaken using resources provided by host governments and DFID bilateral programmes – hence linkages between research and DFID bilateral programmes (as well as National Research and Extension Systems) have been encouraged as a part of a dissemination strategy for RNRRS.

1.4 Learning from past experience

Agricultural research is a long-term process in which priorities are based on technical (and wider) understandings accumulated over many years. It is implemented by relatively small groups of professionals, clustered around disciplines, commodities or research institutes, who not only know each other, but compete, collaborate and form alliances and cliques. This feature of the organisational culture of research influences the process of research review and strategy development within programmes such as NRSP. The outcomes of NRSP research strategy reviews have tended to include recommendations for more research along a similar line and some emphasis on

promising new lines of research. In a peer review situation, reviewers share the assumptions of the researchers, and hence rather little attention is given to exploring wider issues, such as the wider goal of the research, what happens after the research is successfully completed, the policy context and who participates (or is excluded). An increased emphasis on poverty impact from the main funding agency, provides programme managers with a challenge. The cascading log-frame approach may foster a management approach that discourages a significant reorientation of existing research projects. It was not expected that most projects commissioned before the 1997 White Paper would have based their research focus on an analysis of poverty. However, it was anticipated that there would be some evidence, or discussion, in final technical reports of the potential contribution of their research on soil fertility to poverty eradication. The review was commissioned to look for useful insights for the development of ongoing and future research. This would address the need to ensure that newly commissioned research embraces a poverty impact orientation, and core ideas of the sustainable livelihoods approach. This review of completed projects through the SLA perspective provided a potential opportunity for bringing learning from old projects into the new ones, including an opportunity to engage with NRSP on purpose level OVIs. The testing of the hypothesis that improved soil fertility, as an output or an OVI, would indeed contribute to the overall goal of poverty reduction and sustainable livelihoods was important. The review searched projects for **evidence that soil management makes a distinct contribution to the livelihoods of the poor**. The framework used for the review is outlined next.

1.5 A Framework for the review of projects

Literature exists from DFID and other sources on the generic aspects of the sustainable livelihoods approach, including frameworks for the analysis of livelihoods (Scoones, 1998, Carney, 1998, Frankenberg & Drinkwater, 1999) and analytical descriptions of livelihoods (Ellis, 2000). Documentation of experiences with applying the SLA to a range of development activities in natural resources and other sectors has grown substantially over the past two to three years (e.g Ashley and Carney, 1999, Ashley, 2000). DFID's Sustainable Livelihoods Resource Group has provided guidance information on application of the approach. The guidance notes recognise the usefulness of applying the SL framework in the review of projects that were not originally designed using an explicit SL approach (DFID SL Guidance Sheets, para 3.4). However, the focus of the sheets and examples used relate to a range of development projects, and do not provide specific guidance as to how the SL approach might inform a review of research projects and programmes. There are very few examples to follow of the application of SL to agricultural research activities [1].
To the best of our knowledge, the present study is the first attempt to apply the SLA to review a suite of completed RNRRS projects.

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[1] There has been some useful discussion of the policy implications of soil management in the context of rural livelihoods in Africa funded by DFID (Scoones & Toulmin, 1999). Moreover, DFID is supporting work by the International Food Policy Research Institute (IFPRI) to develop a series of case studies that examine the impact of agricultural technology adoption using the SLA[1]. A recent study in Nepal examined the 'policy, institutions and processes' elements of SLA in relation to a DFID-supported agricultural research project http://www.livelihoods.org/resourcegroup/slresourcegroup.html).

The SLA framework used for this review is based on the premise that the SLA is not a radical departure from previous approaches, but one that effectively draws together existing sound development practice and thinking. The starting position is that the SLA is more than a checklist or holistic conceptual framework for thinking about development; it is also about the way that development activities are undertaken, including poverty oriented agricultural research Many of the core principles of the SLA emphasised in Ashley and Carney (1999, p7) relate to this process:-:

- **A people-centred approach** to sustainable poverty elimination will be achieved only if external support:
    a) focuses on what matters to people,
    b) understands the differences between groups of people and
    c) works with them in a way that is congruent with their current livelihood strategies, social environment and ability to adapt.
- **Holistic:** the approach attaches importance to overriding traditional disciplinary and sector boundaries in understanding poverty by using a holistic approach to understanding the context of poverty.
- **Participatory and responsive:** poor people themselves must be the key actors in addressing livelihood priorities. "Outsiders" need processes that help them to listen and respond to the voices of the poor.
- **Multi-level perspective:** the enormous challenge of poverty elimination will only be overcome by working at different levels, ensuring that micro-level activity informs the development of policy and an enabling environment, and that macro-level policies and institutions support people to build on their own strengths (rather than foster dependency),
- **Partnership:** the multi-level perspective, combined with the complex nature of poverty and livelihood strategies, require partnerships between public, private and third sector organisations during planning and implementation.
- **Balancing sustainability objectives:** four important elements of sustainability are; economic, institutional, social and environmental – a balance must be found between them.
- **Dynamic:** external support must recognise and seek to understand the dynamic nature of livelihood strategies and, wherever possible, anticipate directions of change and be prepared to respond to these, developing longer-term commitments (from all stakeholders).

The SL conceptual framework, along with these core principles are, for the purpose of this review, subsumed under three broad headings used to assess the congruence of soil management related research project activities with the SLA. Under each heading questions are asked of each project, and the same categories are used to analyse and discuss the results and their implications for the NSRP:-

1. POVERTY & IMPACT ORIENTATION: To what extent is poverty focus and impact a central feature of the research orientation and outputs?

2. WIDER CONTEXT AND THE SL FRAMEWORK: To what extent is a holistic approach to understanding the wider context (bio-physical and socio-economic), used, in terms of awareness and integration of key aspects of the wider context into the research process?

3. PARTICIPATION & PARTNERSHIP IN IMPLEMENTATION: To what extent is the research implemented in genuine partnership with key stakeholders, using appropriate participatory methods and a learning approach in order to foster uptake and impact of the research outputs?

These three principles were used to frame more specific questions about the scope and focus of the research, and the process of planning, implementation and dissemination within particular projects (see Annex 2).

1.6 NRSP Soil Related Projects Reviewed

A significant number of projects addressing soil, its use and management have been commissioned by the since the RNRRS was launched. There were 22 projects reviewed (see Annex 1 for details). A few of the projects reviewed had started as early as 1992, and all were completed at the time this review was initiated.

The review of these projects was initiated with an expectation that evidence for the contribution of soil and its management to the livelihoods of the poor would be found. The project purpose thus was to use this evidence "to sensitise and influence NR programme and project managers and policy makers to make policy and management decisions with a realistic appreciation of soil as a component of natural capital which is relied upon by poor people in pursuing their livelihood strategies."

Furthermore is was anticipated that the review would contribute to output 1 of the revised NRSP programme logframe: *'Enhanced understanding of the factors that influence livelihood strategies of the poor who are largely natural resource based'*. This output had the following objectively verifiable indicators:

- *By 2002, for the 6 production systems, livelihood strategies characterised through project activities*
- *By 2003, a synthesis of the above completed and key NR based factors influencing livelihoods elucidated*

1.7 Project categorisation

For purposes of review and for reporting on the results, projects were divided into three broad categories:

- Research Strategy Development,
- Trial oriented projects, and
- Model oriented research (including "soft system" approaches)

Research Strategy Development Oriented Projects were undertaken at two levels of strategy development, generic (i.e. research programme) and local (i.e. country or region). At programme level, reviews and workshops were commissioned as part of research programme development. Local strategy development was done in some countries where significant previous research on soil management had been undertaken, to explore a strategy for future research. This involved review of previous research and discussions with key stakeholders in the country.

Trial based projects across production systems were more conventional in terms of their research approach, with a primary focus on conducting trials both on-farm and on-station, backed up by laboratory analysis, with a view to developing and testing soil management technologies for recommendation to farmers. They cut across a range of production systems. Some trials based research projects were more oriented to controlled researcher-led experimentation and others had more farmer management in the experimentation.

Model oriented research projects were based on the assumption that modelling of soil management systems can achieve what is often difficult and expensive to achieve with actual field experimentation. Many of them have field experiments in order to contribute to model building or model verification, or they draw on field experimentation in some of the trial based research projects. Modelling of systems may be "hard" in its approach (i.e. tending to a mathematical and quantified modelling of closed systems) or "soft" (i.e. including more qualitative modelling of more open systems). "Harder" modelling tends to apply to focused studies of selected biophysical processes, while "softer" modelling may apply to a wider range of parameters, both biophysical and socio-economic. Both types of modelling projects have been funded by NRSP, but most of those focusing on harder models were not included. The reason was that they had been reviewed earlier, and potential of finding evidence linking soil fertility management to poverty was judged to be very low.

Many of the projects in each category included PRA and socio-economic data collection. It was expected that this would provide a means for linking the technical outputs and findings with the situations of resource poor households in the areas studied.

The three types of project identified suggest three strands of thinking within the NRSP relating to soils management. A focus on trials suggests recognition that in some situations trials are needed in order to empirically explore biophysical processes over space and time. This may include recognition of the value of engaging farmers in this process of exploration and of verifying the relevance of particular technologies for particular situations. A focus on models suggests that trials alone may not be enough, and an expectation that models provide a complementary tool for understanding the complexity of biophysical and soil management processes, particularly over the longer term. Strategy development activities reflect a recognition that the NRSP research focus within the general field of soil fertility management needs to be shaped through wider consultation. This includes literature review, consultation within the community of UK and overseas soil scientists and in some cases with farmers and other stakeholders in developing countries.

1.8 Final Technical Report (FTR) Review Process

Ideally the review team would have liked to see all the written project outputs and had discussions with the researchers involved. As explained below, time and circumstances did not permit this, and the review relied on the final technical reports (FTRs) and supporting project memoranda. These documents are common to all projects and summarise the approach used, the research findings and the main outputs. To enhance rigour, each project was reviewed by at least two reviewers applying the

same set of questions based on the three SL principles outlined above. A sub-set of questions and guidelines specifically oriented to the category of project in question were used for the reviewing (see Annex 2). These questions addressed issues providing evidence for an SLA perspective in research focus, design, implementation, evaluation and dissemination. Three of the 20 projects were reviewed twice, as they were included in more than one category. A scoring system was used to assess the extent to which the project was congruent with the SL approach in relation to a particular criterion. For each project, the two reviewers met to compare results and agree on scores relating to the extent of SL orientation.

The four reviewers met to synthesise the results for each of the three types of project, using a framework that outlined the strengths, weaknesses, opportunities and questions raised (SWOQ). The results of these meetings are summarised in Annex 3[2].

[2] It was hoped that by this stage we would be in a position to develop a set of further questions to pose to a selection of the researchers and advisors involved in the projects. However, because we found rather limited evidence of the incorporation of SLA features, we felt this would not be a very productive exercise, particularly because these projects were completed and identified weaknesses or opportunities could not be acted upon. It was decided instead to focus further on analysis and synthesis of the results, and to understand why there was limited evidence of the link between soil fertility management and the livelihoods of the poor. This involved revisiting some of the FTRs and related documents in order to examine the underlying assumptions behind programme and project formulation. It is acknowledged that by focusing on FTRs the review is likely to have missed some insights from the researchers involved relating to the linkage between soil fertility and poverty which have not been published. There may be an opportunity to tap into this knowledge at a later stage, perhaps through inviting comments on a final version of this review.

2. REVIEW RESULTS

2.1 Strategy Development Projects

2.1.1 Introduction

The review covered 7 projects completed between 1994 – 2001. The projects reviewed are shown in table 1.

Table 1 Summary of Strategy projects reviewed

Project code	Title	Dates
R 6881	Agro-Forestry Strategy	Feb-Jun 1997
R 6043	Systems Analysis of Soil Fertility	1994-96
R 7099	Improved Utilisation of urban waste by near-urban farmers in Hubli-Dharwad	1998-1999
PD27	Soil and Water Management Review	1996-97
PD37	Soil Fertility Workshop	1996-1997
PD 57	Soil Fertility Visits - ICAR	1997-1998
R 7600	Feasibility of integrated crop management	Mar-May 2000

These projects were either strategy development projects funded by NRSP or were recognised, by the current programme manager, as having had a significant impact on NRSP's strategy. Typical characteristics of the projects reviewed are summarised in box 1 and examples will be drawn upon that illustrate these in the text.

2.1.2 Summary of Review

Poverty and Impact focus

Box 1. Characteristics of the strategic research funded by NRSP.

- Projects emphasised identification of biophysical research topics in the context of NRSP research systems and generally lack understanding of the socio-economic context.
- Projects lack engagement with policy institutions or those target institutions that might constitute uptake pathways for the outcome of the strategic research.
- Projects appear to be designed to reinforce / substantiate the view of the project leader.
- There is little evidence of strategic research – i.e. projects follow a standard formula – literature review, followed by an expert workshop.

While some of the projects commissioned to review strategy are predicated on the assumption that soil fertility decline is a major problem, none clearly substantiate (through literature review or analysis of original data) that soil productivity is declining. Similarly there is no evidence provided thator that any decline in soil fertility is having a negative impact on livelihoods. Hence both declining soil fertility and declining productivity remain assumptions only, even though they are used to justify much of the research commissioned.

There is no clear data no evidence from in the FTRs reviewed suggesting that livelihoods or crop productivity have been jeopardised by declining soil fertility. Further we found little clear evidence of the relationship between the use and management of soil and the livelihood strategies being pursued by poorer households. Beyond an increasing awareness of the need to address poverty, it is not clear that projects engaged directly with issues related to poverty. The reasons for this are not clear, it may be that the scope of the task was narrow, – and thus the projects actually reflect the strategy of NRSP programme management.

Related to this, most strategy development activities did not focus on identifying geographical, natural resource or socio-economic targets, at country or at global level. This lack of focus may relate to a working assumption that geographical and agroecological focus had already been covered through the RNRRS identification of specific production systems and countries.

A comparison of two projects that assessed the opportunity for a technology in a defined system exemplifies different approaches. The first R6881 assessing the opportunity for agroforestry in the hillsides of Nepal was based on interaction in country, both in a workshop forum and through individual contact largely with scientists. Typically such a project would also be supported by a review of literature with an emphasis on country or region specific grey literature. As a consequence an agenda for research on agroforestry was developed – despite it being unclear as to the demand for such research.

In contrast project R7600 assessing the feasibility of integrated crop management (ICM) in the high potential systems of Bangladesh identified potential stakeholders in ICM and developed a strategy for consultation with these stakeholders. This consultation included farmers, scientists and intermediaries involved in delivering support to agricultural communities. An apparent consequence of this dialogue was that rather than focus on technical aspects of ICM alone the project emphasised both institutional and communication / extension components associated with ICM.

Whilst we do not seek to over interpret these observations - the lesson learnt appears to be that, by requiring / supporting strategy development projects that engage with intended beneficiaries, target institutions and key actors it seems that it may be possible to move beyond disciplinary based technical focus.

The empowerment of project leaders to change emphasis of the project during its course is an important issue. The value of this approach was seen above in R7600. Another example is project R7099. This started as a technically focused project, but during the course of the project it became clear that there were many non-technical issues that needed to be dealt with in order to achieve impact. The project leader re-

focussed the project accordingly. Such flexibility of both project leader and NRSP is to be commended, and of clear importance in ensuring that the work being funded is of relevance.

It would be interesting to investigate how project leaders might be empowered to adopt this more flexible approach, with regard to targeting. Is this to do with the structure of the log-frame? Perhaps focusing on delivery at OVI level for the purpose would give scope for revision at output and activity level if agreed with the programme management.

It appears based on this review that there is an opportunity to strengthen engagement with target institutions and key actors by those projects that focus on strategy development. If valuable contributions are made through such studies it is not unreasonable to expect impact of such studies directly the actions of these bodies, rather than relying upon subsequent NRSP supported research projects.

Wider Context

As recognised in Box 1, the projects reviewed do not, in general, invest time and resources in understanding the policy and institutional context and engaging strongly with policy institutions, nor the need to engage with policy and, in some cases, indeed with target institutions. It is not clear at this stage whether this is a reflection of the terms of reference set for the studies or the approach chosen by the investigators. It seems that earlier studies regarded NRSP as the primary client for the research outputs.

Emerging from these observations we are concerned to understand what NRSP management see view as their role in strategy development. If individual strategy projects saw viewed NRSP as the client, did NRSP establish the necessary in-country linkages to take the research forward? In India it is undoubtedly the case that this did happen. Initial dialogue between NRSP and ICAR led to participation by Indian scientists in strategy development in the Reading strategy development workshop (PD 37). This then led to UK involvement in and ICAR workshop (PD 57) and subsequently we understand to pre-inception projects.

Whilst tThe workshop funded by PD57 provides an example of acknowledgement of the importance of the wider context, when issues concerning a 'knowledge gap' emerged. This was the case despite the workshop being was underpinned by assumptions of the need to maintain soil fertility and to achieve productivity increases., it can be seen that issues concerning a 'knowledge gap' emerged from these workshops. Scientists recognised that outputs of their research were not being adopted and used in the way that had been intended. This theme recurs later in our review.

Elsewhere the evidence of such engagement is less clear. In the strategy development in Nepal R6043 for instance we saw little evidence of engagement beyond immediate scientific peers. This project also was an example of a project that appeared to be a series of discipline based reports - with little evidence of interdisciplinarity. In more recent research reviewed evidence of interdisciplinarity started to show through (e.g. R6302, R6799, R7099 and R7600).

Participation in Strategy Development

A comparison of two projects that assessed the opportunities for a technology in a defined system exemplifies different approaches to participation in strategy development. The first R6881, assessed the opportunity for agroforestry in the hillsides of Nepal. It was based on interaction in country, both in a workshop forum and through individual contact largely with scientists. Typically such a project would also be supported by a review of literature with an emphasis on country or region specific information. As a consequence an agenda for research on agroforestry was developed – despite it being unclear as to the demand (beyond the researchers involved) for such research.

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It seems clear from this comparison that there is a need for strategy development projects to engage with a wider body of intended beneficiaries, target institutions and key actors, in order to foster a research focus that is wider than disciplinary based research.

The empowerment of project leaders to change emphasis of the project during its course is an important issue. The value of this approach was seen above in R7600. Another example is project R7099. This started as a technically focused project, but during the course of the project it became clear that there were many non-technical issues that needed to be dealt with in order to achieve impact. The project leader re-focussed the project accordingly. Such flexibility of both project leader and NRSP is to be commended, and of clear importance in ensuring that the work being funded is of relevance.

It would be interesting to investigate how project leaders might be empowered to adopt this more flexible approach, with regard to targeting. Is this to do with the structure of the log-frame? Perhaps focusing on delivery at OVI level for the purpose would give scope for revision at output and activity level if agreed with the programme management.

It appears that, based on this review, that there is an opportunity to strengthen engagement with target institutions and key actors by those projects that focus on strategy development. If valuable contributions are made through such studies it is not unreasonable to expect a direct impact of such studies on the actions of these bodies, rather than relying only upon subsequent NRSP supported research projects.

2.1.3 Emerging issues

1. Strategy development projects did not engage directly with issues related to poverty.

2. A clear link between (declining) soil fertility status and livelihoods is not provided by FTRs reviewed.
3. Projects provide little insight into livelihood options/strategies and the relationship of these to soil use and management
4. There does not appear to have been an explicit and co-ordinated effort to prioritise farming systems or geographical areas where soil fertility is the primary constraint
5. It is not clear that research findings emerging from NRSP research were always picked up and fed into future project development eg. R5163 and observations on interactions between P and organic matter.
6. There is minimal attention to policy issues and dialogue during strategy development.
7. Project leaders need to be empowered to incorporate flexibility into their projects allowing re-targeting where necessary.
8. Interdisciplinarity needs to be strengthened during strategy development.
9. There does not appear to have been an explicit and co-ordinated effort to prioritise farming systems or geographical areas where soil fertility is the primary constraint

2.2 Trial-Oriented Soil Management Research Projects

2.2.1 Introduction

The review covered 6 projects completed between 1992 – 2001. The projects reviewed are shown in Table 2.

Table 2: Summary of Trial projects reviewed

Project code	Title	Dates
R 6382	Sustainable Agriculture in Forest Margins	1995-1999
R 6750	Modelling Soil Organic Matter Transformations and Nitrogen Availability	1996-2000
R 6751	Soil fertility and organic matter dynamics in floodplain rice ecosystems	1996-2000
R 6757	Soil Fertility Management for Sustainable Hillside Farming Systems in Nepal	1996-1999
R 5163	Maintenance of Soil Fertility and Organice matter	1992-98
R 6799	Kumasi Natural Resources Management	1997-2000
R 6731	Manure Management in Kenya Highlands: collection strategies	1996-1999
R 7099	Improved Utilisation of urban waste by Near-By Farmers in Hubli-Dharwad	1998-1999

2.2.2 Summary of Review

The trials focused projects we reviewed generally lack a poverty orientation. In most projects the trials were not targeted at issues identified as having a major influence on poverty for the farmers involved, neither did they involve farmers selected as representing poorer members of a community. An analysis of poverty, its causes, what make poor vulnerable, and the implications for soil management interventions to alleviate poverty is not presented in most of the reports. The main rationale for research relates to increasing productivity and arresting perceived yield decline in general terms. In most projects local researchers were more or less equal collaborators in the research, unlike the farmers who were mainly contracted for use of there land as research sites. Two projects, R7099 and R6382 stand out in terms of a livelihood orientation, giving attention to poverty impact through dissemination, adequate understanding and integration of the wider context, and effective farmer participation and partnership. Four other projects (R6750, R6751, R5163 and 6731) undertook some interesting and important technical research, using farmers fields and involving some consultation with farmers

Poverty and Impact

Much of the technical research was well thought out in the sense that it addressed important soil fertility management issues and therefore had potential to impact on crop productivity and indirectly on poverty (For example the research on nutrient uptake in rice based flood plain systems (R 6750 and R6751), and to some extent SOM in semi-arid systems (R5163). R6382 stands out documenting an early planning initiative which resulted in a significant change in targeting, and by indicating how targeting was informed by an diagnosis of who the resource poor farming families were. R6382 documents its attention to working with poorer farmers and with technology which was appropriate for those short of financial and human capital. However, in general, limited attention was given in the FTRs of trials projects to the issue of poverty, and how the trial results might contribute to poverty alleviation. There could be several reasons for this; lack of appropriate experience on project teams, lack of attention or awareness in teams, or lack of emphasis from programme management at the time. Final workshops tended to be used to rubber stamp or validate technologies rather than to advance the impact of the research or to critically reflect on the research process. It seems, from R6382 and R5163, that the prospects for impact are enhanced when partnerships with well researched projects and local organisations were developed. Could a post-research phase be funded to enhance impact and take ideas forward? In the case of some strategic research, academic and conference papers were reasonably effective in terms of informing the wider research community (R5163, 6750, 6751).

Understanding of and Integration with the Wider Context

Most of the research trials conducted were informed by some understanding of the natural resource context, in terms of the main crops farmers grow in the area and the dominant soil types. However, this understanding was not made explicit in many of the FTRs. Again, there were exceptions. For example R6382 made effective use of existing information on the context; R7099 explicitly devoted more resources to understanding the wider context before undertaking research trials, and in the end this

resulted in the findings and understanding being used to address policy issues – trials may not have been the main intervention needed at that point - perhaps an important lesson. Some projects did make efforts to find out about local knowledge. For example R5163 compared farmers soil evaluations of soil fertility with laboratory evaluations. There were one or two examples of effective mobilisation of stakeholders at the end of projects in order to develop and further enhance impact, and to take promising research ideas forward (R5163 and 6382).

However, in most of the projects the importance of understanding the wider context is not emphasised, and understanding that exists was not effectively used either in refining or redirecting the technical focus or in the interpretation of research results. It may be that the log-frames do not support or encourage this, but rather encourage a narrow technical focus relating to specific yellow brick outputs for particular programmes. In several projects PRAs were undertaken, but seem not to have very effectively shaped the trial focus which it seems was largely pre-determined (R6757 and R6731). None of the projects undertake analysis of vulnerability, and the implications for their technical research. The analysis of trends, such as it exists is largely anecdotal and not linked to an analysis of poverty. R7099 could be criticised for not putting enough resources into technical research and for spending a disproportionate amount of time on understanding the system before starting the on-farm trials. This could have been due to inadequate experience in on-farm research methods which combine on-farm trials with diagnostic activities. Where local knowledge of soils was collected, often this was not used in the design and interpretation of the trials.

Extent of Participation and Partnership in the Process

A small number of projects developed strong local partnerships, and this enabled them to move the research forward to have potential developmental impact beyond the end of the project. For example R6382 developed a good working partnership with CIAT who had good links to local development agencies who could take forward many of the technologies worked on in the project. R5163 had strong links with other research programmes and with local NGOs, enabling part of the work to continue in a more adaptive mode under a different funding source. Effective farmer participation in both on-station and on-farm trials was achieved in R6382, and this influenced the subsequent design of trials and dissemination activities that followed. R7099 developed a partnership with the local municipal authorities resulting in policy changes. Some of the projects, while not involving farmers or policy makers, did worked closely with the local research organisations, in effective partnerships which enabled technical research of a relatively high standard under quite challenging circumstances to be implemented, written up and published in scientific journals. While much of this research was complex and highly sophisticated in terms of the types of analysis and laboratory techniques used, there is limited evidence of effort to make parts of it more accessible to local stakeholders.

Unfortunately however, most project FTRs suggest farmers fields were used largely as research sites and farmers were not involved in a way that empowered them to influence the research design and evaluation process. In cases where would be less appropriate, because the research was mainly strategic (R5163, 6750, 6751) there was very little evidence of effort to get farmers and local extension engaged with

understanding the research. In these cases the impression given is that the local researchers had a limited role in defining the research content, but played a major role in implementation and writing up of the results. Moreover, long-term soil fertility trials seemed to preclude many options for changing the focus of the research mid-stream. There is also little evidence of consultation of other key stakeholders in research design. The role of PRA as a process, to involve the local stakeholders provides opportunities to have an ongoing influence on technical focus that was certainly underplayed.

2.2.3 Emerging Issues

1. Lack of focus and targeting of trials with regard to poverty

2. Scope for improving impact by undertaking research on the back of a TC development project

3. Limited progress with establishing effective participation and partnerships.

4. Projects did not address the issues associated with landless people.

2.3 Model-Oriented Research Projects

2.3.1 Introduction

This synthesis is based on framework reviews for 7 projects shown in Table 3 below:

Table 3 Summary of Model Oriented projects reviewed

Project code	Title	Dates
R 5719	Nutrient Budgets	1992-1995
R 6051	Soils and Cultivars	1994-1997
R 6447	Cover crops	1996-1999
R6603	Nutrient cycling in semi-arid West Africa	1996-1997
R6757	Soil Fertility Management for sustainable hillside farming systems in Nepal	1996-1997
R7056	Nutrient sourcing and soil organic matter dynamics in mixed-species fallows of fast-growing legume trees	1997-2000
R 7093	The relevance of Nigerian Farmers' responses to dryland farming systems in Southern Africa and India	1998-1999
R 5163	Soil fertility – organic matter	1992-1998
R6750	Modelling Soil Organic Matter Transformations and Nitrogen Availability in Periodically Flooded Soils	1996-1999

2.3.2 Summary of the Review

As outlined above this review included a number of modelling projects, but excluded the PARCH suite of models which were reviewed separately. The key findings were:

- Models were strongly biophysical in nature but encompass a wide range of model types
- The clients for models appear to have been scientists and policymakers however their demand for the models was not clearly defined
- Stakeholders were only peripherally involved in model development and validation.
- Most projects modelled single factor process, there may be an opportunity to integrate biophysical and socio-economic models and to explore the link between soil use strategies livelihoods
- The potential use of models to transfer or upscale site specific findings has not yet been tested

Poverty and Impact

This review encompassed a range of modelling approaches. R7093 described a model that is more akin to a "soft system" model, outlining a set of guiding principles while projects R6750 and R5163 are process based dynamic simulation models. As was mentioned earlier the PARCH suite of models was not reviewed here.

Models developed were single factor, crop models, soil fertility models or examined the financial constraints affecting farming systems in Ghana (R6517). No models combined crop growth or soil fertility management with social, economic and financial variables related to poverty.

It seems that the research sought to use models to integrate data and information related to biophysical systems, as a means to synthesis and extrapolate findings. However the models were constrained by the same assumptions regarding the relationship between productivity and poverty described earlier. Thus, poverty *per se* was not modelled, rather different aspects or components which are implicated as factors contributing to poverty such as, productivity, labour constraints or cash constraints . Few, if any models investigated the different aspects of poverty, either as income or other livelihood assets. It should be noted that whilst it may be difficult to mathematically model poverty, the livelihood approach represents attempt to 'model' livelihoods, through the assets pentagon and the vulnerability context. This model is reflected in the thinking in project R7093.

From the review it became apparent that the clients for the modelling research were:

- The biophysical research community
- Policy makers
- CG Research Institutes

These clients were seen as routes to reach the farmers as ultimate beneficiaries. However, the projects reviewed offered little evidence in their design, of analysis of

the questions that these intended beneficiaries sought to answer . This is particularly true for policy makers. The lack of engagement with intended beneficiaries meant that the projects provided little insight as to the potential use and/or development of the models by these groups. Indeed there was little evidence of involvement of clearly identified beneficiaries in the validation of any of the models reviewed.

Where pathways that involve intermediary research clients (eg. IRRI / CGIAR) in the case of R6750, evidence of demand was clearer. However, a consequence of this reliance on uptake pathways is that it is difficult to demonstrate impact as envisaged by the A-H pathway. Impact will need to be traced through target institutions.

A particular missed opportunity relates to the nutrient budgeting work that provided useful insights into nutrient flows at a farming system level (R6757, R6603? others?). These methods were not developed to provide useful tools for the potential clients. Evidence from the literature demonstrates that this was an opportunity missed. Smaling et al (1997) have used nutrient budgets at the regional level to inform policy makers, and others (Defoer et al, 1998) have developed simple decision support tools based on concepts of nutrient flows.

Wider Context

As outlined above the many of models assessed tended to analyse biophysical mechanisms and processes. The model in project (R6517) was an exception as it attempted to analyse the financial components of the livelihoods of smallholders in Ghana. Taken as a whole, the research in this project was not clearly situated in the context of the socio-economic context of individual livelihoods. The work done in Northern Nigeria project suite collected a range of biophysical and socio-economic data to support the hypothesis of a sustainable (in terms of soil productivity) farming system under increasing population pressure. This data was not however put through a "hard" mathematical model which explored interaction between the wide range of variables included in the various studies.

The projects collected extensive information about the biophysical environment and the interaction other between important components. However there was a tendency to aggregate the data collected during the analysis, rather than undertaking analysis at household level (e.g. R6447). This is unfortunate as analysis of the interaction between components of the bio-physical sphere and the links to factors of production and the household decision making processes, has the potential to lead to more practical application of direct relevance to end users.

An underlying justification for the use of models was that they can be used to explain processes and, because of their generic nature, models are transferable between location and across ecological zone. Only one project R7093, a very soft model, sought to test this and concluded that are major limitations to making generalisations about livelihood strategies from one semi-arid system to another. Two projects (R5163 and R6051) operated across a range of semi-arid sites, which enabled them to explore differences between sites and the scope for making generalisations within that particular production system.

Participation and partnerships: Quality and effectiveness with farmers and other stakeholders

Many projects did not articulate the methodology used to engage stakeholders for the duration of the project. Farmers were frequently involved during the early stages for data extraction / collection. Some projects were aware of gender differences and used indigenous soil classifications (R6603 & R6757). R6517 involved farmers during the collection of data phase. This data formed the basis of the model, but once this had been achieved there was little to no further farmer involvement. Frequently there was no dialogue, nor any apparent sharing of results with farmers commenting on their validity. Consequently there was little inclusive discussion or the building of a relationship.

Some projects used farmer experimentation to gauge the accuracy of the model - a much more effective way of validating the model. Many modelling projects concluded with one validation workshop, and there was limited evidence of local interest and involvement in using the model after this.

2.3.3 Emerging issues

The following tentative conclusions have been reached:

1. Modellers consistently targeted policy makers and planners as the end-users of their models, but this was not effective.
2. Most projects modelled a single factor process.
3. There is perhaps merit in taking soil fertility management and developing a livelihood model around it.
4. How do changes in characteristics at a household level affect soil fertility? If innovation is effected at a household level, how does it affect soil fertility.
5. The dissemination of outputs from modelling projects was very poor; the up-take pathways were ill considered.
6. The degree of participation between researchers and extension agents/farmers was poor.
7. Certain modelling projects had very finite boundaries and it is not clear when they fit into the research continuum.

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3. EMERGING ISSUES AND RECOMMENDATIONS

This section summarises the issues emerging as the review progressed. Under each issue, recommendations to NRSP programme management are italicised.

We acknowledge that the emerging issues are based on the review of a limited number of projects, focusing on specific topics that were conceived prior to the current management. NRSP programme management is thus likely to be addressing some of them through its more recently commissioned projects. Most of the issues listed cut across the three categories of project reviewed. Some of the recommendations may apply not only to soil management research, but to programme management more generically.

Findings

1. **There is a lack of evidence of a clear linkage between declining soil fertility and poverty**

   While some of the projects are predicated on the assumption that soil fertility decline is a major problem, none clearly substantiate (through literature review or analysis of original data) that soil productivity is declining, or that any decline in soil fertility is having a negative impact on livelihoods. Hence both declining soil fertility and declining productivity remain assumptions only, even though they are used to justify much of the research commissioned.

   We could find no evidence from the FTRs reviewed that livelihoods or crop productivity have been jeopardised by declining soil fertility. Indeed the results from the suite of projects (R5719, R6051, R 6603 and R7093) covering Northern Nigeria suggest that soil productivity is being maintained in spite of increasing population, challenging the notion of soil fertility decline in semi-arid farming systems.

   With the exception of the farm level case studies in Northern Nigeria and the general descriptions of farming systems in Bolivia, none of the projects explored or provided clear evidence of the relationship between the use and management of soil and the livelihood strategies being pursued by poorer households.

   We got little sense from the projects reviewed of who was engaged in soil use and management. We are aware that in parts of Asia the rural landless are a significant section of the rural poor, and many are engaged in agricultural activities on the farms of others, or in small gardens and backyards. Apart from with work in Hubli Dawad, the projects that we reviewed did not actually draw out this point. Further, the research reviewed was oriented to issues relating to productivity and yield loss, and not to soil management for the livelihood improvement of poorer people.

   Most of the projects were commissioned before the government White Paper on International Development, and this may explain the absence of a clear poverty focus. This holds for strategy development as well as for the models and trials based research projects. The causes of poverty, what makes the poor vulnerable to shocks and overall trends in the system were not addressed. The NRSP poverty paper, as a part of current strategy development, does address this issue in the context of sustainable livelihoods.

We have four key observations:

1. A clear link between (declining) soil fertility status and livelihoods is not provided by FTRs reviewed
2. Projects provide little insight into livelihood options/strategies and the relationship of these to soil use and management
3. Research reviewed lacks poverty focus and detailed analysis of poverty
4. Weak identification of priority soil science issues

Recommendations:

- ***NRSP to establish if other NRSP projects, including current ones***
  a) provide clear evidence of soil fertility decline linked to a worsening or change of livelihoods, and
  b) are investigating the relation of soil management strategies to livelihood strategies and have data on trends in both.
  This can be done through a review of intermediate outputs and email communication to project leaders.

- ***NRSP review its current approach to achieving poverty focus and impact in the project approval, M & E and reporting process.***

2. Research needs to capture local complexity in soil management decisions

Evidence in R7093 argues that decisions are made at the household level and that the constraints to be addressed include the management by households of labour and other limited resources. Innovations in soil management are occurring at the household level, and one argument is that research needs to support this process, rather than impose prescriptive technical solutions. There are various opportunities for building upon and taking forward discoveries of local innovation in soil management. There may be an opportunity to quickly scale up and transfer findings from this process, and this can be done at various scales (farmer to farmer, community to community, project to project, and through information networks etc). Another opportunity is that closer study of local innovation may give rise to research questions of a strategic nature, which require an upstream research approach. Farmer participatory research can be introduced to strengthen this local farmer capacity for innovation and for collaboration in more formal types of research, which may be adaptive and/or strategic.

Recommendations

- ***NRSP to search within ongoing projects and more widely within the "soils and indigenous knowledge research community" for leads into how strategic and adaptive research in soil management can be informed by and better harness farmer innovation. This would be with a view to assessing the promise of such an approach, the UK's comparative advantage with this type of research and partnerships necessary to take this idea forward.***

3. Transferability of research findings

Moving beyond inductive learning from individual experiences of research and innovation, how can research and extension support the process of innovation?

The underlying assumption of the research undertaken by NRSP (and also the CG system) is that a "research or recommendation domain" can be determined that enables forecasting the likelihood of a technology developed in one location, to work in another. These domains can be based on the similarity of biophysical or farming system parameters (e.g. the household resource base, access to markets, food preferences etc.). This is defined as scaling-out (horizontal scaling) (Gündel et al., 2001).

Domains are captured by the production systems of NRSP, while eco-regional zones and benchmark sites are being used by the CG initiatives on natural resource management. It is assumed that technical research conducted in the context of a recognised agro-climatic zone, soil type or production system will be applicable across this climatic zone, soil type or production system. This assumption is linked to the transfer of a technology paradigm, in which research results generated at a central point are transferred to farmers within a defined domain through extension and technology delivery systems.

Within NRSP, models also offered the prospect of a method to transfer research findings. However most projects modelled a single factor process, using "hard systems models". There were no "softer" models, which combined crop growth or soil fertility combined with social, economic or financial sub-routines.

The livelihood diagram is, in some respects, a "soft" systems model. It aims to determine livelihood outcomes in terms of asset availability, process and strategies adopted. There is perhaps merit in taking a hard science subject, such as soil fertility management and developing a livelihood model around it. This would illustrate the difficulties that resource poor farmers have in adopting and sustaining new technologies.

Several of the projects reviewed question the usefulness of the recommendation domain/technology transfer paradigms, particularly in relation to research into soil management and its use. For example, the research in the semi-arid production systems of Northern Nigeria, and subsequent re-casting of this within a livelihoods context (R7093), emphasises that innovation occurs at a household level. Within a single agro-ecosystem, households may adopt quite different approaches to the management of similar soil types, and may innovate in different ways in order to sustain production. Project R6371 conducted research in high potential production systems on manure use conducted in Kenya. Similar findings were concluded: that it is not possible to make general recommendations for manure use for small-holders even within the Kenyan highlands, let alone for those in high potential production systems in other countries and continents. Similarly, the highly controlled series of long-term fertility trials conducted by R5163 in semi-arid eastern Kenya found major variation in responsiveness to P and soil organic matter over a relatively small geographical area.

There is an emerging dilemma. If analysis of the local situation should be the starting point in implementing a livelihoods approach then reductionism (assuming similarities on the basis biophysical parameters, application of models etc.) compromises the basic principle that one should start from a bottom up understanding.

However, as recognized above, development does not start with a completely blank sheet, but with a capacity for generating and interpreting data relating to agricultural resource management, and to facilitate the improved access to information that supports the development process. Further, livelihood outcomes are determined by the ability of an individual to influence and access the transforming structures and processes. Ashley and Carney (1999) recognize that whilst community-level institutions and processes are emphasized in the sustainable livelihood framework, a core aim of the livelihoods approach is to understand and facilitate the link from micro to macro scales. This seems to equate with the vertical scaling or scaling up, described by Gündel et al. (2001) as the processes of multiple-stakeholder involvement and institutional processes.

Building capacity for problem-solving research and development at various levels, from farmers, local communities to a range of agencies involved in dissemination activities, is a challenge that has to be addressed if we are to facilitate the link from micro- to macro-scales argued by the livelihoods framework.

Many questions are raised by this dilemma including:-

- Does the dichotomy between local innovation and research targeted at larger scales (production systems, AEZs) have to be resolved, and if it does what is the way forward?
- To what extent can soil management technical research, including location specific experimentation, be "scaled-up" in a meaningful way, and are there types of research output that are more easily scaled up than others?
- To what extent has research on stimulating local innovation, and building on indigenous knowledge on soils management been able to identify technologies that can be scaled up?
- How have any technologies identified by this type of research been disseminated?
- Are research funds better invested in generating more technical knowledge or in providing information ("decision support") at a community level that enables informed decisions to be made by the users in relation to existing technical knowledge?
- How can effort to extrapolate research results address the various scales at which research is conducted and the often-high levels of local variability in soil conditions (at field, farm and catchment levels)?
- Can modelling provide useful information to guide their decisions on soil management?
- Do we know (or can we approximate?) to what extent some soils problems are location specific and others are more generic?
- If we know for sure that some problems are more generic, should the NRSP programme focus on these rather than on more specific ones?

Recommendations

- ***The issue of transferability of research findings (called scaling by some) appears to be an important cross cutting issue that emerged from this review. The questions raised currently fall beyond the scope of this review. They need to be further explored.***

4. **Using existing information and uptake networks and managing the transition from a research to an impact orientation**

Development oriented research builds on a wealth of information and institutional capacity for generating and interpreting data relating to agricultural resource management. This facilitates the improved access to information that supports the development process. The research projects reviewed did not seek to utilize these information networks extensively. Further, as we have discussed earlier, livelihood outcomes are determined by impinging institutions and policies, and by the ability of individuals to influence policies and access useful services.

Whilst some of the projects reviewed adopted participatory research methodologies we found the positioning of the projects within information networks, as well as the policy and institutional context, weak. Adoption of a livelihood perspective and more flexible projects raises important issues relating to project boundaries and continuity over time. Different skills and disciplines may be required at different stages, as the focus shifts from understanding the context into designing appropriate interventions, and from developing and testing interventions to disseminating these more widely.

However these transitions must be achieved whilst maintaining continuity. It is often difficult for specialist researchers coming into a project for a short time to grasp the key issues and provide the inputs to progress the project in the needed direction. The succession of funded projects in Northern Nigeria, and the long-term soil fertility trials in semi-arid Kenya, illustrate the value of continuity over time in terms of building up good understandings of farming systems and effective collaborator linkages.

However, both projects failed to move from academic or 'descriptive' research into adaptive and applied modes. None of the projects reviewed made serious efforts in this regard, with the notable exception of the project (R7099) on peri-urban waste management.

Recommendations

- ***Research is required to understand how institutional arrangements and policies influence poor people's livelihood strategies, including soil management strategies, and to guide researchers on effective means of engagement with policy processes.***

- ***This understanding will enable development of a pro-active strategy for dissemination that reflects demand for specific types of information presented and that reflects how the information is used.***

- ***The above has implications for project design and links to ongoing development initiatives (see points below)***

5. **Targeting at various levels**

In the strategy development projects reviewed, there does not appear to have been an explicit and co-ordinated effort to prioritise farming systems, geographical areas or social categories where soil fertility might be a primary constraint. This has been done, for example, in a recent CIMMYT prioritisation of research issues

for maize, which identified soil fertility as the major constraint for Africa, but not for Asia and Latin America (Pingali, ed. 2001). Regarding social categories, targeting should consider the circumstances under which categories of poor, such as the landless, may be involved in soil management research – and how. Wherever agricultural activity forms a significant part of livelihood strategies of the landless poor, and important researchable soils management constraints exist, there is a potential to involve them. In Asia the rural landless are a significant section of the rural poor, and many are engaged in agricultural activities on the farms of others (as sharecroppers or labourers), or in small gardens and backyards. Apart from with work in Hubli Dharwad, the projects that we reviewed did not actually address this aspect of targeting.

Recommendations

- ***The NRSP may need to review its approach to targeting at various levels, in the light of emerging evidence. This includes findings from its ongoing research (e.g. the role of the landless is currently being explored in R7974 in relation to soil management in semi-arid areas of India) and from the priority setting by other research agencies.***

6. Research management issues

The issues and recommendations relating to management of the programme are not prioritised, and can be used as a checklist against which to assess current projects on soil management in relation to the SLA, and also a poverty and impact focus more generally.

Carrying promising results into future project development

As NRSP moves towards the conclusion of the programme there is a need to draw together and build upon previous research. For example, the project by Geoff Warren R5163 in Kenya based on SOM and N made very clear observations about P and its interaction with organic matter that were very important at the time and are still highly relevant. This may be an example of an important finding that was overlooked. NRSP have just funded work on P in Kenya, but did this work pick up on the findings of Warren or upon a programme development visit by FM Quin and C Okali to Kenya? What are the implications?

Recommendations

- ***NRSP to review its procedures for using the results from refereeing of final technical reports to inform programme development.***

Limited attention to making impact through Technical Co-operation projects?

Research and technical findings can be catalysts for developmental impact when set in the larger context of appropriate uptake pathways. There is considerable scope for improving impact and adding value to research by undertaking research in collaboration with ongoing or planned DFID Bi-lateral development projects. This potential is emphasised in the "yellow brick" (Anon, 1994) there are relatively few examples of it taking place in practice. One reason is to do with the geographical separation of research and development advisors (within DFID and more generally), and the different time-scales and institutional and policy contexts within which they operate. Effective collaboration requires communication and

planning over a prolonged period of time, ensuring that sustainable and effective working relationships are established. The work in Bangladesh and Bolivia (R7600 & R6382) were exceptions and the potential for this was also seen in R5163, although in this case the development project ended before the research did.

- ***NRSP management may wish to explore programme management strategies, such as clustering of projects and development of cross cutting themes, that enable them to maximise and draw together their portfolio - highlighting opportunities for linkages DFID, both in London and in the regional desks.***

- ***The process for monitoring and mid-term review of projects needs not only to be rigorous, but also to be undertaken with a view to ensuring that: promising work is not terminated prematurely; partnerships are in place to foster a focus on developmental impact which prevails over publishable outputs; a critical mass of researchers and related key stakeholders are involved; and that there is effective collaboration with regional DFID advisers and bilateral projects during reviews.***

Flexible projects and log-frames

Empowerment of project leaders to change the emphasis of projects (e.g. R 7099 and R 7600) seems to have been a useful feature of the more recently commissioned projects included in the review. This flexibility, provided it is managed effectively, is useful in the context of incorporating a livelihoods perspective into projects, and responding to emerging opportunities and concerns raised by southern partners.

Recommendations

- ***NRSP to encourage the use of the log-frame as research management tools including and to examine mechanisms used by the programme for monitoring to ensure that such flexibility is retained whilst minimising the risks of abuse (e.g. of a continually shifting focus of issues).***

Establishment of effective partnerships

Effective partnerships are paramount in achieving success in a project. In general it is not clear that effective partnerships - particularly those that included target institutions and key actors, who were likely to take findings forward, - were developed.

People involved in the projects reviewed may not have been given adequate encouragement, incentives or guidance in developing partnerships with stakeholders beyond their immediate research collaborator. They may have seen this as being the responsibility of the national researchers involved. PRA's may not have been done in a very inclusive way. Or perhaps "success" as viewed by the researcher is different to "success" in development terms as viewed by NRSP/DFID.

Recommendations

- ***NRSP to circulate guidelines on partnership management to project leaders.***

Participation and inclusion of those targeted for poverty alleviation.

In most of the projects, participation was not well focused, both at farm level, and between disciplines. This is most evident in the model-oriented projects. There are many challenges. These include fostering ownership within limited time and budgetary frameworks, raising researcher awareness of the benefits and costs of more inclusive approaches, addressing gender imbalances and managing an equitable balance relating to decision-making and funding.

- ***NSRP to circulate relevant guidance material relating to participation to project leaders at concept note approval stage (e.g. socio-economic methodologies best practice guidelines relating to participatory research, stakeholder analysis and gender analysis)***

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ANNEXES

ANNEX 1

NRSP Projects Reviewed

Project Code	Title	Start	End	Cost	Countries	Reviewed by
	STRATEGY ORIENTED PROJECTS					
R 6881	Agro-forestry research strategy for Nepal	Feb 1997	May 1997	£10,637	Nepal	HBO, JG
R 6043	An analysis of Soil fertility Systems in the hills of Nepal	April 1994	May 1996	£41,038	Nepal	HBO, JG
R7099**	Improved utilisation of urban waste by near-urban farmers in Hubli-Dharwad city-region	Jan 1998	Dec 1999	£98,509	India	HBO, JG
PD 27	A review Soil and Water Management research in semi-arid areas of Southern and Eastern Africa	April 1996	Mar 1997	£8,544	Anglophone Southern and East Africa	AS, JM
PD 37	Integrated Nutrient management on farmers fields: Approaches that work	Nov 1996	Mar 1997	£4,248	India, Nepal, Kenya, Ghana, Colombia, Niger	AS, JM
PD 57	The role of long-term experiments in agricultural development	Nov 1997	Feb 1998	£7,997	India	AS, JM
R 7600	An assessment of strategies for integrated crop management	Mar 2000	Jul 2000	£44,877	Bangladesh	AS, JM
	TRIAL ORIENTED PROJECTS					
R 6382	Sustainable agriculture in Forest margins: Weed management for sustainable agriculture in forest margins	Apr 1995	Mar 1999	£398,198	Bolivia	HBO, JG
R 6751	Soil fertility and organic matter dynamics in floodplain rice ecosystems in Bangladesh	Nov 1996	Mar 2000	£63,030	Bangladesh	HBO, JM

R5163**	Maintenance of soil fertility and organic matter	Jun 1992	May 1998	£482,758	Kenya	AS, JG
R6757**	Soil fertility management for sustainable hillside farming systems in Nepal	Jan 1997	Dec 1999	£74,173	Nepal	AS, JM
R6799	Kumasi Natural Resources Management	Jan 1997	Mar 2000	£137,043	Ghana	HBO, JG
R7099**	Improved utilisation of urban waste by near-urban farmers in the Hubli- Dharwad city-region	Jan 1998	Dec 1999	£16,388	India	AS, JM
R 6731	Manure management in the Kenya Highlands: Collection strategies to enhance fertiliser quality and quantity	Sept 1996	Oct 1999	£32,097	Kenya	HBO, JG
	MODEL ORIENTED PROJECTS					
R 5719	Nutrient Budgets in relation to the sustainability of indigenous farming systems in northern Nigeria	Oct 1992	Dec 1995	£147,600	Nigeria	AS,JG
R 6051	Soils, cultivars and livelihoods in North East Nigeria	May 1994	May 1997	£125,710	Nigeria	AS,JG
R6447	Environmental adaptability of tropical and sub-tropical legume species as hillside cover crops	Jan 1996	Mar 1999	£229,190	Nepal,	HBO, JM
R 6517	Agroforestry options for Ghana: Land use planning with integrated biophysical and multiple objective models	Jan 1996	Jul 1998	£107,490	Ghana	HBO, JM
R 6603	Nutrient cycling or soil mining? Agropastoralism in semi-arid West Africa.	Jan 1996	Nov 1997	£90,126	Nigeria	AS, JG
R6757**	Soil fertility management for sustainable hillside farming systems in Nepal	Jan 1997	Dec 1999	£74,173	Nepal	AS, HBO
R 7056	Nutrient sourcing and SOM dynamics in fast growing legume trees: WaNuLCas, a tool for assessing Agroforestry options in Africa.	Dec 1997	Nov 2000	£132,491	Kenya, Indonesia, Tanzania, Ghana, Malawi, Uganda, Zimbabwe	HBO, JM

R 7093	The relevance of Nigerian Farmers' responses to dryland farming systems in Southern Africa and India	1998??	1999??	£20,819	Zimbabwe, Malawi, India	AS, JG
R5163**	Maintenance of soil fertility and organic matter	Jun 1992	May 1998	£482,758	Kenya	HBO, JM
R 6750	Modelling Soil Organic Matter Transformations and Nitrogen Availability in Periodically Flooded Soils	Nov 1996	Nov 1999	£	India	AS, JM

** Projects reviewed under more than two categories.

ANNEX 2

Review Framework Questions and Guidelines

TRIALS ORIENTED PROJECTS	
QUESTION	**NOTES ON QUESTIONS**
Poverty and Impact orientation	
• TPI.1 To what extent were the beneficiaries clearly identified; gender, social status and resource base considerations?	Beneficiaries: farmers, extension, NARS, input agencies, other uptake agencies. Farmers gender, caste/ethnicity, land-size, land quality, livestock ownership, labour, knowledge.
• TPI.2 Was a methodology to target the needs of poorer households described & implemented?	Characterisation survey, purposive selection, wealth ranking, gender inclusion strategies.
• TPI.3 Were targeting efforts monitored, reviewed and corrective action taken?	Records of who participated, analysis of their socio-economic status, discussion of what to do, new selection methods and approaches, changes in style and content to accommodate resource poorer.
• TPI.4 What was done to promote dissemination of findings to impact on beneficiaries?	Field days, support to farmer to farmer dissemination, farmer recommendation panels, farmer or extension training, technical bulletins, simplification and circulation of research findings to extension, seed bulking support, leaflets etc.
• TPI.5 To what extent was the impact of the research followed up?	Correspondence with partners and uptake agencies, initial uptake studies, follow-up studies.
Wider context integrated	
TWC.1 What evidence is there that the project analysed the wider context, in terms of social, financial and economic circumstance of the identified target group, and what makes them vulnerable?	Results of socio-economic analysis and vulnerability analysis reported and analysed in relation to the technical research objectives. PRA results, time-lines, flow charts relating to soil management, nutrient flows etc. Socio-economic literature reviews.
TWC.2 What evidence is there that this analysis was used to modify or focus the technical research in terms of implications access to labour, land, cash, inputs and the management of household assets?	Reported or observed change in technical focus, or in manner of conducting trials, linked to analysis above.
TWC.3 To what extent did the trial planning and design process consider key interactions with other bio-physical components of the farming system?	Identification of positive and negative ICM and livestock-crop interactions?

TWC.4 To what extent did the research build on an understanding of farmer's livelihood and coping strategies and their indigenous knowledge on soil management?	Descriptions of livelihood and strategies influencing soil management, local knowledge of soils, use of local soil classifications, related to and incorporated into research process.
TWC.5 If the project made technical recommendations, to what extent did these take account of the wider context?	Recommendations specific to target groups, labour constraints, input availability, policy and market trends, existing farmer knowledge and categories.
Participation and partnership	
TPP.1 To what extent were farmers involved in discussing, planning and implementing the on-farm trials?	Community level planning meetings, and workshops, PRA including diagnosis and identification of researchable options, plot size, approach to replication, controls, management levels etc.
TPP.2 If on-station trials were implemented, to what extent were the farmers involved?	On-station open days, on-station trial design informed by PRA, farmer panels used to evaluate.
TPP.3 Were the results of the experiments evaluated and discussed with farmers? To what extent did farmer feedback influence future experimentation and direction of the project?	Evidence of farmer assessment, ranking results, use of farmer criteria, change in experimental content and design over the period of the project, devolution of responsibility on trial design and management to farmers over time.
TPP.4 What role did the partner institution play in the research project –*(e.g. full partner, assistant partner, data collectors, front only)?*	Focus stipulated in the call or not. Extent of partner institutions involvement in experimental design, analysis and discussion of results with farmers, publication, reports on discussion of trial focus and design, data analysed locally, co-authored reports and papers.
TPP.5 What evidence is there of an iterative dialogue developing between the different parties involved in the project?	Reports on meetings, reports on views of different parties.
TPP.6 During monitoring what evidence is there that emerging issues and lessons were incorporated into on-going technical work?	Changes in technical focus explained in relation to emerging issues and lessons, discussion or negotiation on changes to the log-frame.

REVIEW OF MODEL BASED PROJECTS	
QUESTIONS	NOTES
Poverty and Impact orientation	
• MPI. 1 To what extent was the model "user-friendly", producing results that guided decision making by the intended beneficiaries?	Model clearly presented in FTR, and results presented and linked to decision making process – farmers, policy makers, extension etc.
• MPI. 2 Were beneficiaries and benefits clearly identified, in terms of who will use the model and for what purpose?	Beneficiaries identified clearly. Benefits of model listed, citation of similar modelling approaches yielding benefits in similar situations.
• MPI .3 Is there strong evidence of demand from the identified beneficiaries for the information provided by the model?	Beneficiary involvement in meetings for planning and analysis and reporting results, adjustments made to meet specific needs of beneficiaries.
• MPI.4 To what extent does the model investigate the relationship between soil management and poverty?	Poverty and decision making parameters included and reported in analysis of results.
• MPI.5 If the model did investigate this, were aspects of poverty defined to cover measures beyond income?	Non-monetary parameters used, such as labour, nutritional values, extent of knowledge, seasonality, gender dis-aggregated data, claims on resources, obligations and debts, access to land, key inputs and services, household decision making etc.
• MPI.6 To what extent does the model effectively extrapolate results over a wider geographic area and /or ecological range? Is this discussed in the FTR?	Attention to farmer and site selection representativeness, discussion of and attempts at extrapolation .
• MPI.7 To what extent are dissemination activities specifically designed to impact on end users, including policy, research and development agencies?	Dissemination strategy described, engagement with end users and policy towards the end and after the project.
• MP1.8 Is there evidence of uptake of the model and its outputs by southern based policy formulation, research or extension institutions?	Follow-up studies, follow-up projects, requests from southern partners for information or training on the model.
Wider context integrated	
• MPP.1 How effectively does the model incorporate the social and economic circumstances of the target group, including	Scope of model, detail of socio-economic parameters, analysis integrates socio-economic parameters convincingly.

gender and resource access differences and their current strengths across a range of assets?	
• MWC.2 Are there social, economic and financial models (sub-routines) attached to the main model and if so how realistic are they?	Evidence of sub-routines, assessment of realism using ground truthing methods.
• MWC.3 Does the model consider key interactions with other bio-physical components of the farming system– ICM and livestock-crop interactions?	Scope of model, attempts to link with other models, range of contextual data gathered on biophysical aspects and use made of it.
• MWC.4 Does the model consider policies influencing soil management decisions and technology uptake, and their impact on rural households?	Scope of model, link to policy models, range of policy information gathered and use made of it.
• MWC.5 Does the model take account of trends and shocks (egs?) that increase poor peoples vulnerability and risk?	Time frame, use of time series data, assessment of typicality of time period covered during model development and verification.
• MWC.6 Was the model validated (e.g. model output Vs reality) How did it equate?	Evidence and discussion of validation and the results.
Participation & partnership	
• MPP.1 To what extent were farmers, both female and male, involved in defining the model elements and analysing the results?	Evidence of farmer input, use of farmer categories and knowledge in design and interpretation, efforts to make model available to farmers.
• MPP.2 How much were local farmer knowledge and skills used in the design of the model?	Use of farmer soil type categories, participatory diagramming, use of local units of measurement.
• MPP.3 Were the results of data provided by farmers shared and discussed with farmers, with efforts to involve specific categories (e.g. women and the poorer)?	Records of meetings with farmers, attendance by gender, monitoring of participation at meetings, recommendations developed with farmers help.
• MPP.4 Is a methodology for involving key stakeholders in model building described?	Meetings with stakeholders documented.
• MPP.5 To what extent were national researchers and development agencies "equal" partners in model building, analysis and documentation of	Evidence of local adaptations of the model, names on reports and publications. NARS and other development agencies used the model once validated?

the findings? Were their ideas and interests incorporated?	
• MPP.6 Did models produce information that is easily understood and used by local extension agencies and policy makers?	NARS and other development agencies used the model once validated.
• MPP.7 What evidence is there of an iterative dialogue developing between the different parties involved in the project?	Reports on meetings. Feedback from the various parties during design, data collection, validation etc. Evidence that the model was changed in response to new information on key parts of the wider context or in response to suggestions from collaborators?

STRATEGY BASED PROJECTS	
QUESTIONS	**NOTES**
Poverty and Impact orientation	
• SPI.1 To what extent were poverty and impact high-lighted as key issues in the review and strategy development process and any linked TOR?	TOR focus, who involved in the review – reviewers and those consulted, importance given to poverty and development impact.
• SPI.2 To what extent was a coherent strategy developed for development oriented research to impact on poverty?	Strategy is presented clearly, linked to key development issues, clear analysis of poverty and links to soil management, recommendations of how SM research can more effectively impact on poverty and livelihoods.
• SPI.3 Were significant constraints and opportunities to impacting poverty through SM research identified?	Constraints & opportunities listed, analysed and addressed in strategy.
• SPI.4 Were successful examples of where SM research has impacted on poverty identified and the reasons analysed?	Examples listed and results analysed or cited as potential models.
• SPI.5 Were the results of strategy development disseminated to researchers and other relevant stakeholders?	Dissemination documents and records, calls for bids reflecting new strategy, focus and quality of new proposals.
• SPI.6 To what extent are options for "scaling up" the results of successful previous SM research for wider impact developed?	Discussion of need for scaling up, identification of opportunities for increasing impact of commissioned research, commissioning projects to scale up results.
• SPI.7 To what extent are ideas for raising the profile of SM research issues among policy makers and advisors to development agencies developed?	Policy briefings commissioned and circulated, workshops targeting policy makers and advisors, efforts to bring advisors into programme development and steering groups.
Wider context considered	
• SWC.1 To what extent does the strategy development process emphasise links between biophysical with socio-economic processes at farm and landscape levels?	Who is involved in strategy development – cross disciplinary teams, TOR for strategy development, underlying justification for strategies proposed reflects understanding of wider context rather than more of the same technical research.
• SWC.2 To what extent does the strategy development process recognise the importance of understanding trends and shocks	As above, encouragement in TOR of using a historical perspective, mention of trends and shocks and their implications.

affecting soil management that increase household vulnerability or risk?	
• SWC.3 To what extent does the strategy development process address the development of key links to other biophysical research programmes ?	Communication with other research programme managers (DFID, NARS, ARIs?) on strategy development and opportunities for synergy (e.g. ICM and livestock-crop interactions), engagement with advisors on the same.
• SWC.4 To what extent does the strategy development process address key links to relevant socio-economic and policy research?	Communication with policy research programme managers and social development advisors on strategy development. Communication with bilateral advisors.
Participation and partnership	
• SPP.1 To what extent were the UK based implementing researchers involved in the strategy development process?	Strategy development workshop reports, dialogue at various forums, correspondence etc.
• SPP.2 What efforts were made to consult southern partners during SM research strategy development?	Approaches through bi-lateral advisors, direct approaches, targeted invitations to workshops.
• SPP.3 Is a methodology or process for involving key stakeholders in developing research strategy described?	Minutes of meetings at programme management level and correspondence.
• SPP.4 Was the strategy presented to stakeholders for feedback and were further adjustments made to address issues raised?	Draft documents circulated for comment, what was involved in the Yellow brick process?
• SPP.5 Did the strategy take account of existing farmer knowledge and skills in future research on SM, and indicate how this might be done?	Mention of ITK, justification of how useful, examples given in strategy.
• SPP.6 Was adequate and effective use made of previous strategy reviews?	SPP.7 Previous programme leaders and "innovative researchers" consulted during strategy development, critical reflection on previous research strategy exercises, past weaknesses highlighted and new opportunities addressed.

ANNEX 3.

Summary of Strengths, Weaknesses, Opportunities and Questions analysis (SWOQs)

1. Strategy Development SWOQ Analysis

Poverty and Impact

Strengths
- Post 1997 increased awareness of poverty
- Some project leaders empowered to change logframes

Opportunities
- Capture strategic thinking of NRSP and host countries in relation to poverty and impact
- Donor "takes" on poverty
- Explore differences of emphasis
- Levels of poverty and impact points clarified
- Dialogue between researchers and others on policy, and NRSP and bilateral aid programme advice on poverty strategies

Weaknesses
- Direct link not articulated, poverty context weak
- Projects funded to keep systems alive
- Some programme leaders not empowered
- Lack of engagement with policy institution
- Lack of definition of target institutions and up-take pathways

Questions
- Focus on poor, rather than poorest, legitimate?
- Impact orientation influenced by management structure?
- Who decides we need these strategies (R6881)
- Underlying rationale?

Participation and Partnership

Strengths
- Most projects engaged strongly with science base in NARS
- Genuine progress in developing meaningful partnerships to foster legitimacy or co-ownership.

Opportunities
- Further explore whole strategy development process with NRSP
- Outline legitimacy of strategy to main stakeholders

Weaknesses
- Technically based
- Non-engagement of civil society

- Weak articulation of strategy for participation and partnership

Questions
- What are the boundaries in strategy development, especially for such a broad topic?
- How much process and participation can you allow in strategy development?
- Who decides the strategy to be developed? And how?
- Who is involved in the process?
- Are strategy developers empowered to challenge the status quo?
- Who should be involved in the strategy development process?

Wider Context

Strengths
- Trend in strategy development towards including socio-economic issues.

Opportunities
- More effective engagement by research and other stakeholders in strategy development
- Explore opportunities for synergy

Weaknesses
- Policy context from previous reviews
- Socio-economic context in strategy formulation
- Strategic thinking to develop projects
- Vulnerability not addressed
- Strategy decision makers not able (or unwilling) to identify & pursue opportunities indicated in commissioned work

Questions
- Why not engage more with players outside of current context?

2. Trial-Oriented Project SWOQ Analysis

Poverty and Impact

Strengths
- Technical research well thought out re: developmental issues
- Flexibility with regard to targeting during the project (eg. R6382)
- Improved impact achieved through research on back of Technical Co-operation project
- Some examples of effective mobilisation of stakeholders
- Impact of strategic research on wider community

Weaknesses
- Limited attention to the issue of poverty, and poverty alleviation.
- Final workshops did not critically reflect on the research process.

Opportunities
- A post-research phase funded to enhance impact and take ideas forward

Questions
- Maintain technical rigour AND relevance for other extension, policy makers etc?
- Aim to verify what is already "known" explore the unknown?
- In complex environments conduct formal trials or encourage farmer experimentation with options?
- Are guidelines needed on how SM trials better address poverty ?
- Possibility of changing trials so that they are more impact oriented during project?
- Economic analysis of soil management trials?
- Value of long-term trials to test models –are there alternative options for trials?
- Site selection for soil management research, basis for extrapolating?
- Use of farmer assessment and local knowledge for research interpretation?
- How can projects be more focused on poverty analysis?
- Valid to change the focus of project mid-stream, towards policy issues?
- Do all trials and projects need to directly address poverty, or can some trials address more basic but important issues with expectation of impact further down the line (R6750)?

Wider Context

Strengths
- Most trials informed by some understanding of the wider context.
- Some projects made efforts to find out about local knowledge.

Weaknesses
- Generally, wider context is not emphasised.
- Much data can be generated without influencing "endusers"
- Relevant knowledge that exists is not effectively used.
- PRAs undertaken, were not effective in shaping the trial focus.
- Few projects undertake analysis of vulnerability.
- Some projects (R7099) could be criticised for putting few resources into technical research.
- Where local knowledge of soils was collected, often this was not used in the design and interpretation of the trials.

Opportunities
- Use of systems analysis / understanding to inform trial design and implementation.
- Vulnerability analysis

Questions
- Balance between the wider context and undertaking publishable trials?
- Skills needed to put technical research into a livelihoods context?
- Empowering project leaders to use contextual information for technical?
- Did R6382 refocus in the light of contextual data collected?
- Reason for inter-disciplinary weakness?

- Integration of qualitative and quantitative data in project design / interpretation?
- Mechanisms for sustaining links so wider context is integrated?

Participation and Partnership

Strengths
- Some projects developed strong local partnerships with good impact (R6382; R5163; R6382; R7099)

Weaknesses
- Most projects used farmers fields as research sites, not changing design in response to farmer feedback. Projects conducting on-station research - little effort to get farmers / local extension engaged.
- Little evidence of effort to make the more upstream research accessible to local stakeholders.
- Long-term soil fertility trials- few opportunities for changing the focus of the research mid-stream.
- Little evidence of consultation of key stakeholders in research design.
- Single shot PRAs to inform design rather than truly involving stakeholders.

Opportunities
- More involvement of local stakeholders in trial design, implementation and interpretation.
- Involving farmers more in full research process

Questions
- Why were farmers not involved in the trial design?
- Will involvement in research design increase stakeholder participation?
- Why do PRAs not always lead to increased participation?
- Can landless be involved in soil management research – and how?

3. Model Oriented SWOQ Analysis

Poverty and Impact

Strengths

Opportunities
- Scope for narrowing of focus on impact points.
- Scope for using existing information derived from focused models for extension.

Weaknesses
- Coarse resolution limits application.
- Expensive way of gaining systems understanding.
- Poverty not addressed effectively.

Questions

- Where were they heading in terms of end users?
- Where was demand coming from?
- What is the time frame for impact?
- Is it legitimate to fund modelling by CGs to increase understanding?
- How to ensure that a model will take strategic research into adaptive policy intervention?

Participation and Partnerships

Strengths

Opportunities

- Engage with others involved with more applied models (e.g KIT) to take forward positive aspects of this work
- Southern Institutions to lead on this type of research

Weaknesses

- Extractive.
- Little farmer involvement.
- Poor description of methodology.
- UK dominated.

Questions

How to better involve southern Institutions and farmers in modelling?

Wider Context

Strengths

- Trend to acknowledging value of "softer" approaches incorporating socio-economic data to embrace Sustainable livelihoods (Mortimore – R7093).

Opportunities

- Develop focused "hands on" models or tools
- Link to rainfall in semi-arid areas

Weaknesses

- Too much focus on bio-physical science.
- Poor integration of farmer decision-making and poverty processes.

Questions

- Should we widen or narrow scope of models?
- How complex can we usefully go?
- Economic models – are they needed?
- Models vs. information – for the decision-makers?

ANNEX 4.

Project Log-frame

Review of NRSP soils-related research in the context of sustainable livelihoods for the rural and urban poor

NARRATIVE SUMMARY	**Objective Verifiable Indicators**	**Means of Verification**	**Risks, Assumptions & Conditions**
Goal			
To deliver new knowledge that enables poor people that are largely dependent on the NR base to improve their livelihoods	By 2005, in at least two countries per production system, new knowledge from NRSP research that can benefit the poor in use by at least two of the following: • Policy makers at various levels In each programme year, as new knowledge is created from NRSP research, international RNR knowledge systems enhanced	Institutions' reports Minutes of board meetings of relevant institutions Government policy statements Survey report on usage of new knowledge Hit count per year on the NRSP website DFID country desk reports	On a global scale, the relatively positive policy support for poverty reduction is maintained
Purpose			
NR managers and policy makers make policy and management decisions with an appreciation of the contribution of soil as a component of natural capital relied upon by poor people in pursuing their livelihoods	1 By Dec 2001, NRSP strategy documents reflect the rationale used by farmers, research managers, extension agents and policy makers in deciding the importance of improvement of soil to the livelihoods of poor farmers 2 By March 2002 the above refinement of research strategy is reflected in research that NRSP commissions 3 By March 2003 promotion of (DFID) sustainable livelihood methodologies reflects the importance of soils and their management as a component of livelihoods.	NRSP strategy statement and programme reports NRSP research calls DFID sustainable livelihood group records and PR material	Soil accepted as a component of natural capital. Sustainable livelihoods are dependant on soil fertility

NARRATIVE SUMMARY	**Objective Verifiable Indicators**	**Means of Verification**	**Risks, Assumptions & Conditions**
Outputs			
1 Key issues for achieving livelihood impact through sustainable use and management of soil [– a component of natural capital] identified from completed DFID NRSP soils research.	By Feb 2001 a consultation document that situates soil as a component of natural capital in the context of livelihoods of both rural and urban poor is available for comment by NRSP SG. By Feb 2001, framework for review of soils-related research in the NRSP portfolio is agreed with NRSP PM team. By March 2001 review of NRSP's past soils-related research highlights a list of potential Strengths Weaknesses and Opportunities for strategic use of research funds to achieve impact on livelihoods through soils-related research.	Project and NRSP records Minutes from NRSP SG meeting. Report on review of past NRSP projects.	That NRSP has funded research that provides a basis for the specified indicators to be established
2. Those undertaking DFID NRSP research and those developing sustainable livelihood policy and methodology sensitised to the importance of soil and its management in the context of livelihoods and opportunities for poverty reduction.	By June 2001 strengths weaknesses and opportunities for strategic use of research funds to achieve impact on livelihoods through soil management identified and agreed by target research community and DFID representatives.	Report for workshop with target research community and representatives of DFID sustainable livelihoods group.	

NARRATIVE SUMMARY	**Objective Verifiable Indicators**	**Means of Verification**	**Risks, Assumptions & Conditions**
Activities			
1.1 Identify key issues which situate the management of soils within sustainable livelihoods, and use them to draw up a framework for reviewing research projects.	By 15 Jan 2001 a working document drafted for presentation and discussion at meeting at IACR on 22 Jan 2001 Proposed framework to review NRSP projects presented to NRSP SG in Feb 2001	Minutes for meeting held at IACR. Minutes from NRSP SG meeting.	
1.2 Using framework and interviews, evaluate 20 soils related selected NRSP projects for livelihood impact.	By 15 Jan 2001 panel to review projects finalised By 31 March 2001 follow-up interviews of promising projects completed By 20 April 2001 results of the evaluation presented in review paper.	Minutes of meeting of review panel. Review paper summarising findings of NRSP project evaluation.	
2.1 Presentation of findings of review to NRSP researchers and DFID sustainable livelihood group members. 2.2 Elaborate through facilitated working groups strengths weaknesses and opportunities for strategic use of research funds to achieve impact on livelihoods of the poor through soil management	By 30 April 2001 "policy" workshop held with key NRSP researchers and representatives of DFID sustainable livelihoods group. By 15 May 2001 production of workshop report. By 8 June 2001 results of review process SWOT analysis presented in a paper.	"Policy" workshop report. Paper summarising findings from "Policy" Workshop group discussions.	

Pre condition: Target researchers and representatives of DFID sustainable livelihoods group agree to involvement in debate.