

Chapter 7 Strategic Review and Possible Ways Forward

7.1 Lessons Learned – Walking the Tightrope between Scientific Knowledge Generation and Livelihoods Impact

- 7.1.1 Changing signals regarding research applied to poverty alleviation, and later the need for institutional capacity building in the South, have repeatedly changed the course of research programmes in RNRRS. Social science aspects were seriously under-represented in early years but have arguably consumed large resources in latter years, necessitating a reduction in physical and biological science components.
- 7.1.2 PMs and PACs have very capably adapted the research project portfolio and individual projects to the changing signals. Early reluctance among scientists to move from the more basic toward the applied end of the research spectrum has been overcome. Frustrations about the increasingly applied nature of research, even beyond research into development, have been transformed into significant enthusiasm regarding the increased potential for direct impact on science policy and the livelihoods of poor people.
- 7.1.3 Laudable as the above may be in terms of development of poorer countries, it raises issues whether - in a model with DFID-dominated development research financing - UK-based science is being forced to abandon or reduce its contributions to more basic research. While some independent observers view the shift as a positive change, increasing the likelihood of uptake and improving the potential impact on poor peoples' livelihoods, others express disquiet that in latter years, RNRRS programmes may have been reinventing known development paradigms, rather than making a unique contribution to new knowledge.
- 7.1.4 Innovative concepts are being developed to allow the wider group of stakeholders to be incorporated within the research matrix (e.g. CPHP's Partnerships for Innovations). In some cases research/development activities have been labelled as action research, action learning, adaptive research etc, however some of the activities exhibit many of the characteristics of small-scale short-term (and therefore probably unsustainable) development projects. Since almost all programme Logframes have been revised after the onset of the RNRRS to emphasise dissemination and uptake, and these revisions have been approved by DFID, it is reasonable to assume that the shifts in balance have partially, if not fully addressed DFID's requirements.
- 7.1.5 Most programmes have established clustering or strategic linking of research initiatives. This has enabled continuity between aspects of basic, applied, action and adaptive research. It has stimulated longer timeframes for strategic research initiatives to operate within and allowed for inter-disciplinarity within project cycles. The RNRRS now needs to identify and build on clustering principles to develop cross programme and multi-disciplined work further.
- 7.1.6 Looking to the future, the new research funding framework⁵² defines DFID's objective for research as: 'To promote the production and uptake of technologies and policies that will contribute to poverty reduction and the achievement of the Millennium Development Goals.' Referring specifically to the relevant researchable problem, 'Sustainable Agriculture especially in Africa', the new funding framework identifies three intertwined approaches: participation, technology and access. Only the second of these relates to the generation of new technologies and practices, and the specific examples given imply adaptation rather than fundamental research. This would suggest that the successor activities to RNRRS should display the same bias towards dissemination and uptake, capacity building, and engaging with policies, institutions and processes to remove constraints which prevent adoption of suitable technologies, as the current programmes do.
- 7.1.7 Keeping in mind the objectives of the funding institution, in this case DFID, the question of whether the current balance is appropriate can be answered in terms of (a) the global context and comparative advantage of any future programme (b) ability to respond to new research challenges and (c) efficiency in delivery of the expected livelihoods impact.

⁵² DFID (2004), DFID Research Funding Framework: 2005-2007, DFID, London, UK.

7.2 The Global Research Context and RNRRS Comparative Advantage

- 7.2.1 As stated by the House of Commons Science and Technology Committee⁵³, it is impossible to make sustainable progress towards the MDGs without harnessing the potential of science and technology, which as part of a vibrant innovation system can provide a route out of poverty for developing countries. Indeed, scientific and technological capability is critical to enabling developing countries to overcome the trade barriers and quality standards imposed by the world markets. The application of science and technology to agriculture is essential for food security.
- 7.2.2 The RNRRS operates in an environment with vibrant alternative suppliers of its products. With regards to IPGs alternative providers include the universities and national research councils in the UK and other developed countries and the CGIAR.
- 7.2.3 In most industrialized countries with large development assistance budgets, development researchers have a numbers of funding sources. But in the UK, ODA/DFID appears to have been the main or sole financier of development research during the last 2 decades. DFID has moved from aid tied to UK institutions, goods and services to simultaneously trying to support the maintenance and generation of intellectual capital in development research in the UK, while assisting selected developing countries to expand their expertise, and supporting a number of IARCs.
- 7.2.4 The CGIAR is the principal global agricultural research effort for production of IPGs for poverty reduction with an annual budget of £220m and 14 IARCs, 13 of which are located in developing countries. The UK is a founder member of the CGIAR, and DFID claims that its contribution has increased its poverty focus and the emphasis given to capacity building.⁵⁴
- 7.2.5 With regards to NPGs, alternative suppliers to the RNRRS include developing country NARS, the regional and sub regional research organisations such as FARA, ASARECA, and to a much lesser extent the plethora of NGOs and private sector institutions particularly in the area of technology dissemination. Capacity in many of these institutions has increased significantly over the last two decades although many institutions, especially in Africa remain very weak.
- 7.2.6 In the above context RNRRS has to find its niche. The International Development Act 2002 sets out the ways in which the UK can spend money on international development. The Act establishes poverty reduction as the over-arching purpose of British development assistance, either by furthering sustainable development or promoting the welfare of people.
- 7.2.7 The RNRRS has generated globally recognised and influential programmes covering the key facets of natural resources research and the use of research in the fight against poverty. The strategy has generated the flexibility required to evolve over the 10 year period and to emerge as a world leader in balancing aspects of basic, applied and adaptive research supplying outputs to impact on poverty. DFID need to be able to ensure that it builds on and strengthens the foundations developed over the last 10 years.
- 7.2.8 Over the 10 year period the RNRRS has generated enormous stakeholder networks. These cut across international, regional and national development issues including academic, public, private and the NGO sectors. All these networks are influential, but their synergy needs to be strategically addressed if they are to reach their full potential for supporting policy and practice changes and enhance the practicalities of poverty reduction.
- 7.2.9 In recent years UK, in line with other international donors, has been moving away from project and programme support in favour of direct budgetary support. According to this model, donors provide funding directly to developing country governments. DFID country programmes now primarily support developing country Poverty Reduction Strategy Papers (PRSPs) through which countries identify the opportunities for, and constraints on, poverty reduction. PRSPs are developed through consultation within the developing country now a days, usually incorporating the MDGs. DFID manages the UK aid budget and works to eliminate world poverty through the achievement of the MDGs.

⁵³ House of Commons Science and Technology Committee, 2004. The Use of Science in UK International Development Policy. Thirteenth report of session 2003-2004.

⁵⁴ DFID 2004, Research Funding Framework 2005-2007.

- 7.2.10 Over time, UK development research institutions have been dependent on DFID for funding, as UK research councils and ministries have come to expect DFID to ensure continuation of intellectual capital in UK institutions. In early years, the major proportion of RNRRS funds appears to have gone to British researchers and most was spent in the UK. With the untying of aid in 2000, more funds are now being allocated to and spent by southern institutions, drawing on the expertise of UK institutions when appropriate and where they have comparative advantages.
- 7.2.11 DFID's research funding framework 2005-2007 indicates that the focus will be on sustainable agriculture especially in Africa where science and technology feature prominently in the priority areas adopted by the New Partnership for African Development (NEPAD). Pillar 4 of its Comprehensive Africa Agriculture Development Programme (CAADP) is on agricultural research, technology dissemination and adoption. The long-term pillar, aims at achieving accelerated gains in productivity and will require: (a) enhanced rate of adoption for the most promising available technologies so as to support immediate improvement of African production by way of linking, more efficiently, research and extension systems to producers; (b) technology delivery systems that quickly bring innovations to farmers and agribusinesses so making increased adoption possible, notably through an appropriate use of new information and communication technologies; (c) renewing the ability of agricultural research systems to efficiently and effectively generate and adapt to Africa new knowledge and technologies, including biotechnology, needed to increase output and productivity while conserving the environment; and (d) mechanisms that reduce the costs and risks of adopting new technologies.
- 7.2.12 A hallmark of the current RNRRS is that it takes research through to promotion to end users, but is not expected to duplicate dedicated providers of IPGs such as developed country research councils and the CGIAR, or dedicated providers of NPGs such as NARS. One can therefore see two types of roles for the RNRRS – filling the gap left by dedicated providers of IPGs and NPGs in which case it may be somewhat in competition with regional and sub regional organisations, or complementing the work of the dedicated providers by offering an alternative channel for UK development aid to directly influence science and technology policy in developing countries. The challenge facing RNRRS is to effectively and efficiently define and fill its niche, without duplicating or undermining the efforts of alternative suppliers.

7.3 Ability to respond to new research challenges

- 7.3.1 In order to be effective, applied research to generate NPGs often has to draw on bodies of scientific knowledge generated by more basic research. This of course does not necessarily require use of the linear model of basic – applied research, as the basic research can be conducted almost simultaneously with the applied research. The fundamental requirement is that when there is need for so-called upstream or basic research to address a development problem the broader research system must be in a position to undertake it. Will there be sufficient room within the evolving RNRRS structure to undertake enough basic research to keep the pipeline of appropriate technologies flowing? Alternatively, will there be an efficient mechanism to tap into such knowledge generated and available outside the RNRRS?
- 7.3.2 The Core Team concurs with the view expressed by some PMs and many stakeholders interviewed in the field, that the present system of contracting short- run, 1-3 year research projects is not very appropriate for more basic research aimed at generating natural resource management IPGs. Forestry, soil fertility and similar research need a longer time frame, not to mention the time required for genetic transformation of crop and livestock species. It is to the credit of the PMs and PACs that RNRRS programmes have managed to use repeat or follow-up projects to stay with one research topic for long enough to yield positive results. Section 7.8 contains some very good examples of successful long term research projects. However, this cannot be expected to go on indefinitely – the system needs to be changed to allow longer term projects.

- 7.3.3 It often does not take long for applied research and dissemination projects in developing countries to empty the proverbial cupboard of appropriate technologies, or to find out that the shelves are very empty to begin with, thus necessitating the launching of more basic research. The experience of the DFID sponsored INNOVA project in Bolivia is not unusual in that respect. So any effective applied research programme must be able to respond effectively. There are signs that the mechanisms in the current RNRRS restrict its ability to respond effectively. An example is the case of the recently emerged problem of bacterial wilt in banana which needs funding for some fundamental research, but for which RNRRS collaborators could not receive funding to launch an appropriate long-term research programme. CPP has had to initiate the research through other funding sources.
- 7.3.4 In the view of the Core Team, RNRRS as it stands with its mode of short term contracting of relatively small projects, is not an efficient model for producing the IPGs and stream of technologies that are needed to underpin effective applied research and dissemination programmes that would have major impacts on rural livelihoods in developing countries. This is borne out by the relatively low output of scientific knowledge by RNRRS programmes in comparison with CGIAR Centres and UK universities, although the quality of what is produced is high (section 4.4).

7.4 Delivering livelihoods impact

- 7.4.1 The present mix of projects in RNRRS is aimed at producing both International Public Goods (IPGs) and National Public Goods (NPGs). Because of the applied nature of the research and its proximity to the end users, the latter are expected to have much shorter term impact on livelihoods of the poor. As indicated in the discussion in Chapter 5, RNRRS has not yet had much impact on the livelihoods of the poor in developing countries, although there are prospects of more impact in the future.
- 7.4.2 Provided there is technology on the so-called shelf, it can be argued that more focus on applied research, dissemination and capacity building activities in UK as well as in developing countries, i.e. shifting the balance of the programme more “down stream”, would increase the chances of poverty impact.
- 7.4.3 In the view of the Core Team, in trying to produce both IPGs and NPGs, investment in dissemination activities has come too late to show measurable impact within the time frame of the RNRRS. Such investments would need to continue for a much longer period to have demonstrable effect.

7.5 Concluding Remarks

- 7.5.1 By building on earlier work, the current RNRRS contains many of the necessary elements for successful impact on poverty. On the basis of discussions with programme managers, examination of the documentary evidence and the country visits, the evaluation team has noted (chapter 5) a number of attributes for successful impact on the livelihoods of the poor, these include:
- the capacity to stay on a research topic for as long as necessary, usually implying long term research activities;
 - being grounded in an objective analysis of the priority problems of the poor; and
 - being part of a cluster of related projects and hence having an effective and dynamic network of researchers and other stakeholders as well as diversity of effective institutions in the project leadership to provide multi-disciplinary approaches.

7.5.2 However, it is also evident to the Core Team that the RNRRS, as presently constituted is, having some difficulty in generating a large stream of scientific knowledge and IPGs, as well as in making much impact on the livelihoods of the poor. In the view of the Core Team, DFID runs the risk of not achieving its long term objectives with the current model, unless resources are significantly increased to allow longer term basic/fundamental natural resources development research either within or outside the RNRRS framework⁵⁵, as well as longer term country based applied research and dissemination activities.

7.6 Future Research Funding and Management Options

7.6.1 This section of the report presents a number of options for the future RNRRS. In order to determine which is most appropriate, DFID must define its precise objectives for natural sciences research. In discussion with stakeholders, a number of possible objectives and priorities were identified. For example, is the new scheme primarily intended to:

- Deliver new knowledge? (and what should be the balance between international public goods (IPGs) and national public goods (NPGs)?)
- Link stakeholders into existing knowledge so that they can use it in their specific circumstances? (basically adaptive research and dissemination)
- Demonstrate benefits in order to influence national processes and systems? (influencing institutions and processes)
- Build sustainable links between research institutions? (capacity building)
- Build capacities in southern research institutions to enable them to influence their national governments to access resources and develop country specific research programmes? (capacity building)

7.6.2 In order to reap the full benefits of investments in RNRRS, successful research themes should be identified and incorporated into any future RNR research programme. Using a very top-down approach the evaluation team has identified a number of research themes in the current RNRRS that could be continued in future (7.9). However, the list is only of relevance for any future programme if it is assumed that the goals and objectives and implicit priorities, as well as the funding level in the current RNRRS programmes continue in the future. And even then, it is essential to verify them by formal beneficiary consultations. The identification for the future scheme needs to involve full participation of all stakeholders, with their varied vested interests taken into account. In order to get over the critical issue of uptake then research users need to be engaged through out the process.

7.6.3 Broadly, five options for the future scheme can be identified:

- An open competitive model, similar to the approach adopted by UK research funding councils.
- Improved contracted research: continue with a number of contracted-out commodity/discipline-based research programmes along the lines of the existing RNRRS.
- Global consortia to be theme-based and broadly in line with the existing development research centre model.
- Country-based consortia: similar to Option 2 but country-specific in a limited number of locations.
- A combination of the above options: a scheme which includes several different funding channels to achieve different objectives.

⁵⁵ This should not be interpreted as an argument for blue sky or pie in the sky basic research, but rather as one for the type of basic or fundamental research directly targeted at addressing problems and relieving constraints faced by large numbers of poor people, and of which there are examples in RNRRS.

Option 1: Open Competitive Model

7.6.4 If a high priority is given to IPGs, then an open competitive fund is likely to stimulate innovative and leading edge proposals, primarily from UK and other 'developed world' institutions. However, the role of such DFID-funded bilateral research by comparison to CGIAR research would require careful definition. The evaluation team understands that consideration is being given to establishing a separate funding channel to support strategic/fundamental research, so it is not discussed further here.

Option 2: Improved Contracted Research

7.6.5 Option 2 would imply continuation of the existing programme arrangements, with a number of commodity/discipline-based research programmes contracted out to individual managing agents (either single organisations or partnerships) which would contract a series of short-term stand alone project from a variety of researchers on a competitive basis. The main features of this model would be:

- Continuation of the existing research programmes.
- The potential to continue with current contractors, or to initiate a new round of competition.
- A Programme Advisory Committee with a clear mandate and role for each programme.
- Competitive bidding for research projects led by UK or southern institutions including private sector and NGOs

7.6.6 This option confers some advantages, notably:

- Continuity – staying with a model that has performed reasonably well, as described elsewhere in this report.
- Ability to deliver both IPGs, a main raison d'être of any internationally-funded research programme, and NPGs.
- Potentially the lowest transition costs as many of the existing structures and processes could be continued.

7.6.7 However it also has a number of disadvantages:

- The drive for poverty focus and impact at local levels results in a dual agenda for IPGs and NPGs.
- Short-term projects leading to difficulties with production of IPGs and achievement of research impact.

7.6.8 Lessons learnt through this evaluation suggests that, should this model be continued, a number of improvements would be advisable, including:

- Larger and longer term research projects.
- A new governance mechanism to improve coherence and coordination, facilitate monitoring and evaluation, lesson learning and dissemination, and strengthen accountability to a wider group of stakeholders.
- Earmarked resources for relationship building, sharing and lesson learning, and capacity building.
- Quantified performance indicators to ensure that research contracts are awarded in line with overall objectives.

Option 3: Global Consortium

7.6.9 Option 3 would involve one or more consortia with responsibility for pursuing a long-term (for example, 10 years) demand-driven research agenda on priority thematic areas. Each consortium could be formed by between 6 and 10 (say) natural resources research institutions (public and private) from the north and south. A lead institution would be the primary contractor, responsible for establishing the consortium. The primary contractor would have explicit responsibility for supporting southern researchers and research institutions within the consortium. The consortium would have significant resources available for programme development activities including capacity building, dissemination and uptake promotion. Consortium members would be linked by memoranda of understanding, and would take joint responsibility for the delivery of contracted logframe outputs. The consortium would be responsible as a group for articulating demand, setting priorities, and planning and implementing a programme of research within the logframe parameters. Competitive contracting could still be used, but the consortium should have the flexibility to commission research in other ways as necessary. As for Option 2, governance arrangements should include a 'Consortium Advisory Committee' for each consortium as well as an overall Steering Committee to coordinate and oversee all of the consortia.

7.6.10 Several of the features of this model have already been tested through DFID's development research centres although these are focused on social rather than natural sciences. Evaluations of the DRCs indicate that these features may overcome some of the drawbacks of the existing RNRRS model. The advantages of this option include:

- The establishment of longer-term partnerships between institutions as well as individual researchers, providing continuity and momentum, and thus improving the likelihood of dissemination and uptake.
- More 'natural' capacity building for researchers and institutions through working alongside others and sharing expertise.
- Greater potential for continuity of research themes, with ongoing programmes rather than a series of individual contracts.
- Greater potential for integration and synergy between research activities within the consortium's remit.

7.6.11 However, there are also some potential disadvantages:

- This model would continue the dual focus on production of international as well as national public goods, as described for Option 2 above.
- The relatively narrow membership of the consortium could stifle innovation and limit the involvement of non-consortium researchers, potentially reducing the quality of science.
- Experience has shown that this style of capacity building makes significant demands on the time of the most experienced researchers. If this results in reduced output of peer-reviewed publications, it may make consortium membership less attractive to high quality research institutions.
- Transition costs are likely to be medium, certainly higher than Option 2 above because of the necessity for establishing completely new research management arrangements.

Option 4: Country-based Consortia

7.6.12 Option 4 would have many of the features of Option 3, but each consortium would be based in an individual country. The consortium would consist of a number of local (public and private) and international natural resources research organisations, implementing a long-term demand-driven research agenda of 10 years or more. Each consortium would be accountable to a National Steering Committee consisting of representatives of local stakeholders such as NARS, Universities, NGOs and civil society organisations, farmer organisations, agricultural trade and finance organisations, relevant government ministries, sub-regional research organisations, and local DFID representatives. As for Options 2 and 3, governance arrangements should include an overall Steering Committee with external stakeholder representation to coordinate and oversee all of the consortia. A task force would be specifically charged with putting mechanisms in place to ensure a demand-led research agenda. Competitive contracting could still be used, but there would be substantial core funds for the national research organisations, and capacity building, including institutional capacity building, would be fully integrated into the research programme.

7.6.13 This model has a number of advantages, including:

- A clear focus on the production of national public goods (leaving the production of IPGs to be funded by DFID through the CGIAR funding window and/or Option 1).
- With local control of the research agenda, demand-driven research will be much more easily achievable, and momentum for dissemination and uptake will be greater, increasing the potential for impact.
- Structured institutional capacity building can readily be incorporated.

7.6.14 Potential disadvantages include:

- Only a limited number of target countries could be included in order not to spread available funds too thin (with 2-5m pounds per country per year, existing RNRRS funding of 25m per year will allow only 5-12 countries to be covered)
- Substantial funding from a single donor may lead to distortion of national natural resources research priorities.
- Core funding for national research organisations may raise issues of sustainability.
- Institutional capacity building may require the involvement of professional institutional development expertise which may complicate consortium management arrangements.
- Transition costs for the establishment of this model are likely to be higher than for Options 2 and 3.

Option 5: Multi-channel Approach

7.6.15 Depending on the balance of priorities which is determined, a multi-channel approach comprising elements of some or all of the above models could be developed. The main advantage of this approach would be that it confers the ability for DFID to remain involved in the broad spectrum of research activities from fundamental to adaptive, and could also accommodate a focus on dissemination and uptake activities to ensure impact on poverty. This would, for example, allow DFID to retain a separate channel for research aimed at IPGs, and avoid complete reliance on the CGIAR mechanism. It would also allow some separation of research outcomes from efforts to achieve poverty impact, which will be important if fundamental research is to continue.

7.6.16 The major disadvantage of this approach would be its managerial complexity. It is likely that DFID would need to establish and manage a variety of different types of contracts, and oversight and stakeholder involvement would be complicated. There is also a significant risk that the multi channel approach would be less coherent, scattering resources too thinly to achieve impact. Transition costs are likely to be high.

7.7 Selecting the Most Appropriate Options

7.7.1 As described above, DFID must determine its priorities for the new research funding framework and the most appropriate option or options must be selected in the light of these. Considerations include:

- Option 1 should be favoured if leading-edge innovation and fundamental research for generation of IPGs are prioritised.
- Options 2 and 3 both offer the potential to achieve a balance between international and national public goods, and between research, dissemination and capacity building. However, Option 2 places more emphasis on funding research across a wide agenda with a variety of degrees of competition, while Option 3 places more emphasis on continuity and southern representation.
- Option 4 should be favoured if demand-led, country-level adaptive research with potential for short-run impact on livelihoods in a relatively small number of countries is prioritised.
- Option 5 would be appropriate if DFID wants to achieve a combination of objectives.

Transition Arrangements

7.7.2 Pending clarification of priorities and determination of the most appropriate option for future research management, it is not possible to systematically determine which research themes should be continued or terminated. Furthermore it would be risky to end the existing research programmes as currently planned. There is a significant risk of losing important work streams if specific provision is not made to accommodate them in whichever research model is chosen, as projects will be wound up and research teams with no expectation of funding to continue working on a particular theme are scattered. It therefore appears that a further period of transition funding may be necessary to allow time for:

- Determination of priorities for the new framework.
- Selection of the most appropriate management option and putting arrangements in place for it.
- Identification of thematic areas which need to be continued and including these within the most appropriate management arrangements.

7.8 Some Success Stories

7.8.1 DFID has encouraged programmes to develop material on success stories to illustrate the achievements of the RNRRS. Each programme contains a section in its annual report on these, and it is invidious, in some ways, to pick out individual success stories. However, the following do illustrate some of the general strengths of the programme.

The Tsetse and Trypanosomiasis cluster

7.8.2 This cluster of projects, which has been funded by both AHP and LPP stretches back to work undertaken in the 1980s, and illustrates the importance of addressing a major constraint from different perspectives. Current work includes laboratory and field-based research projects, dissemination of effective technologies through farmer-field schools for livestock keepers, and evaluation of a low-input high impact control of tsetse, by restricted application of insecticide. Both programmes are active on the issue, but are coordinating through the common PAC.

7.8.3 AHP is addressing the four areas that it sees as necessary to achieve impact: pursuing research over a long time period, having a critical mass of research projects, ensuring an effective delivery system and influencing policy to ensure an enabling environment. The programme has been active in international debate, has promoted its findings at policy level, resulting in changes in regulations in Uganda, and has disseminated research outputs to farmers directly and to service providers in the region.

7.8.4 The many tsetse control techniques developed with DFID and formerly ODA funding, and in particular recent breakthroughs which have been co-funded by LPP and AHP, will be incorporated into aspects of the African Development Bank (ADB) \$ 80 million programme for work to create tsetse and trypanosomiasis free areas covering 215,000 sq km in six East and West African countries, co-funded by participating governments and by the African Development Bank, with a loan for \$65 million.

Rainwater harvesting projects

7.8.5 Development of improved rainfed cropping system, incorporating rainwater harvesting/ conservation – R5170, R5752, R6758, R7888. This line of research was initiated in 1992, and challenged the idea of working on drought resistant crops as the main solution for semi-arid areas, but instead positioned itself on the continuum between rainfed agriculture and irrigated agriculture. Initially research focussed on the technical aspects of RWH, to demonstrate the benefits of this approach to farming. More recently, the focus has shifted to disseminating knowledge to farmers, and raising the profile of RWH with policy makers. This suite of projects is managed by NRSP.

7.8.6 The research has had significant impact at policy level in Tanzania, where the work was carried out with Sokoine University of Agriculture. It is being promoted for inclusion in district development plans. Analysis of the economic benefits of the technology shows that it can increase the returns to land very substantially, particularly in vegetable production, but may actually reduce the returns to labour. The interest in the approach is such that a project has now been started to promote the technology in Nigeria.

Self-recruiting Species in aquaculture, their role in rural livelihoods R7917

7.8.7 This project is included as a success story because it has addressed an area which has received little attention before, but one which is critical to the livelihoods of the poorest, who are unable to afford hatchery-produced fish. These resources have been ignored by aquaculture extensionists, but the project has identified specific management measures which can increase harvest of these species. Work has been undertaken with farmer groups in Cambodia, Thailand and Vietnam to explore the potential for improved communal management of the resources, particularly in the rice-fish farming system, and project results are beginning to influence policy. The project was a joint initiative of AFGP and FMSP.

Urban and peri-urban livestock study in 5 East African cities ZC0201

7.8.8 This was a scoping study commissioned by LPP to examine urban livestock keeping, and assess its role in the livelihoods of the poor. The study found that this was an essential livelihoods activity for many of the poor, but was not recognised by city planners, and in many cases was actually illegal. Urban livestock keeping brings many associated problems, which are not being addressed because of its status, such as waste management, and water availability. Quality control of livestock products is also minimal.

7.8.9 A workshop was held on the findings of the study which included policy makers, and this was followed by local consultations in Uganda between landless livestock keepers, city officials, civil society, research organisations and donor groups have resulted in a change in local ordinances giving rights to city livestock keepers in return for them registering and confining their activities to certain areas within the city. This is a good example of research identifying constraints on livelihoods and engaging in the policy process to address them. The study was carried out by local researchers, which increased both ownership of the findings and access to policy makers.

Participatory Crop Improvement Research

7.8.10 PSP has funded a series of projects exploring different methods for involving farmers in plant selection and breeding. The work started in Nepal, but is now being promoted in India and Bangladesh. The projects have used both participatory varietal selection (PVS) and participatory plant breeding (PPB), the first testing pre-existing varieties with farmers and the second creating new varieties in breeding programmes carried out by plant breeders and farmers working in partnership. Although PPB takes longer than PVS, it can still save at least seven years in the speed of adoption over traditional plant breeding methods.

7.8.11 As well as direct benefits to farmers in the project areas, in terms of increasing varietal choice and increased productivity, there are already wider impacts of the projects, in terms of spread of the rice varieties bred in Nepal to other countries, but, more importantly, adoption of the methodology by other breeding programmes. This is currently happening in India and Ghana, and it is hoped that it will be adopted in the future by organisations within the CGIAR. It is estimated that the internal rate of return to the Nepal projects could be as high as 83%.

7.8.12 All the success stories described above have at least one of the following characteristics:

- A research theme has been followed through a number of individual projects, starting with either an element of basic research, or a new methodology, which has been developed, adapted and applied at local level, then disseminated at regional or international level. The results have influenced policy, and have, or are anticipated to lead to positive outcomes and impact on poverty.
- Initial scoping studies, or ongoing research, have led PMs to look at researchable issues from a new perspective, and identify gaps in the research agenda. These may have resulted from insufficient understanding of the livelihoods challenges facing the poor, or from misconceptions about possible applications of existing technologies or methods. AS a result, there has been better identification of the constraints facing the poor, and possible interventions to address these, at both policy and technology levels.

7.8.13 The specialist review of the FRP identifies six attributes which have led to project success:

- Being grounded in an objective analysis of the priority problems of the poor
- Being part of a cluster of related projects and hence:
 - Having an effective and dynamic network of researchers and other stakeholders
 - Diversity of effective institutions in the project leadership to provide multi-disciplinary approaches
- At least one of the contractors in a cluster having a history of successful engagement with the programme
- Being part of suite of project showing good response to changing circumstances
- Having dedicated resources within the cluster budget to allow for effective coordination amongst the contractors
- Independent programme management

7.8.14 On the basis of discussions with programme managers, examination of the documentary evidence and the country visits, the evaluation team endorses the importance of these attributes in achieving success.

7.9 Future Research Themes

7.9.1 The TOR for this evaluation require that the evaluation identify components of the programmes which have made, or have strong potential to make an impact on poverty, including impacts on science, policy and communication, and whether or not these components might be continued.

7.9.2 Throughout this evaluation report practices and processes are assessed in order to arrive at conclusions to inform decision making by DFID regarding future natural resources systems research.

7.9.3 In this section of the report the research themes which in the view of the Specialists should be continued beyond the current RNRRS are briefly identified. Three very important caveats are necessary regarding the themes below:

- a) They are identified after a maximum of 21 days of work of Specialists, and mainly from the point of view of good science, although with the expectation that they would have the expected poverty alleviation impact.
- b) There is no input of potential beneficiaries or target populations in their selection, i.e. they are a supply driven rather demand led list of themes.

- c) They are only of relevance for any future programme if it is assumed that the goals and objectives and implicit priorities, as well as the funding level in the current RNRRS programmes continue in the future.
- 7.9.4 As indicated in Chapter 9 of this report, the evaluation team would expect that DFID would re-examine its priorities in the light of the totality of this evaluation report, the position of future DFID funded NRS research in the global context, especially in relationship to the development of IPGs and NPGs, changing national and geopolitical policy considerations, before deciding on themes that need to be continued. After such re-examination the Core Team expects that research themes not included in the compilation below might be included based on discussions by DFID and/or independent observers with PMs who naturally have intimate knowledge of current research themes, and appropriate representatives of beneficiaries.
- 7.9.5 *Aquaculture and Fish Genetics Research Programme*: The three themes (seed production; aquatic animal health and Systems) have consistently produced scientifically significant and developmentally relevant results. Seed production is often a bottle-neck to commencing production, health problems are of increasing importance and a holistic systems approach is essential to contribute in a development context. These central themes should be considered in a future programme.
- 7.9.6 *Fisheries Management Science Programme*: Five themes (information to inform management-research and influence policy; information systems to support the co-management of fisheries important to the poor; fisheries assessment methods to inform management; pro-poor capture fisheries management strategies; pro-poor enhancement fisheries management strategies) should continue to combine relevant basic and applied research towards improved management. These five themes address essential research issues and deserve continued support.
- 7.9.7 *Post-harvest Fisheries Research Programme*: Three core research areas are “to develop improved methods to identify the source and magnitude of post-harvest losses and promote take-up and use by key institutions; to develop appropriate value-adding and loss reduction processes and technologies and promote use by key stakeholders; to generate new knowledge of the structure and operation of post-harvest credit and market systems and the impact on the poor of changes in the utilisation of fish and disseminate this knowledge to key policy makers and stakeholders”. These have apparently resulted in useful development activities which have been implemented, but they have not contributed to significant research results, especially during the latter years of the programme. They are unlikely to prove fruitful in terms of future research if the present approach is maintained. It would be more appropriate to combine research aspects of post-harvest fisheries with an expanded fisheries management programme and to consider support to selected development activities under bilateral development cooperation channels.
- 7.9.8 For all three fisheries programmes above, it would be useful to pay added attention to cutting-edge research on natural resource management in developmental contexts. Newer research areas on questions of “non-equilibrium ecology” applied to fisheries and aquaculture, and challenges to conventional thinking in development contexts could be usefully explored and critiqued. Considerations of political economy and newer ideas on “political ecology” that are relevant to scientific discourses on development issues could be incorporated.
- 7.9.9 *Animal Health Research Programme*: Research themes to continue into the future are (a) vaccine-development and disease control projects which should include those projects built as clusters with participants from different research groups in the UK and the South (e.g. the vaccine development project, the integrated vector management project and the zoonotic diseases cluster) each with duration of a minimum of 5 years; and (b) demand-led research that focuses on the real needs of the poor livestock keepers, building on the AHP 2002 study “Investing in Animal Health to Alleviate Poverty “ and the AHP influential international reputation.
- 7.9.10 Research projects that are not connected with research clusters should not be continued e.g. rabies vaccines in dogs and jackals and CCP vaccine development. This is not saying that all the individual projects were unsuccessful, but it is considered that research clusters involving scientists from the UK and the South is a better guarantee for sustainability.

- 7.9.11 *Crop Post Harvest Programme*: There are five themes covered in the current programme (reducing storage losses, food safety and nutrition, value through processing, access to markets, and institutional arrangements). The bioscience content decreases as one moves storage losses theme to the institutional arrangements theme and the social science content increases. In the future choices will need to be made on the balance between more strategic research or more applied work. Of the themes above food safety and nutrition seems particularly important for a strategic research programme. An important cross cutting theme that needs to be emphasised is the promoting of linkages between farmers and their markets.
- 7.9.12 New crop post harvest science themes that may warrant research in the future relate to roles of climate change (e.g. on pest species/treatment outcomes/viable technologies), changing crop profiles, non-food crops, (e.g. starches), natural products (e.g. natural pesticides/ antimicrobials both for post harvest use and for commercial exploitation).
- 7.9.13 *Crop Protection Programme*: Themes recommended to continue are: (a) insect pests in Sub-Saharan Africa (non-chemical pest control options emphasizing microbial control of insect pests; regional integrated pest management - one-country projects have been too limited in scope and should not be continued unless they are upgraded to a regional scale); (b) disease control in Sub-Saharan Africa with focus on projects that aim at presenting means of sustainable disease control amongst which exploitation of plant disease resistance ranks high; and (c) weed problems in rice in Asia with focus on the environmental and human health impact of the increasing use of herbicides in the region.
- 7.9.14 *Forestry Research Programme*: Trying to identify themes in isolation would be to throw away the substantial benefits of improved programme management achieved by FRP especially since 1997. The currently supported broad “themes” (such as water, carbon and forest fruits and other non-timber forest products) may well need to be replaced in the light of future policy changes. It is essential to avoid recreating the less successful previous approach, evolved from the “Yellow Brick”, of a plethora of technical forestry projects. While such work can be scientifically very sound it has usually proved to have rather limited impact. The review of needs should be maintained and the aim should be to support research clusters around wider forest and tree functions that contribute to trade, poverty and livelihood support.
- 7.9.15 Technical themes such as the genetic evaluation of species groups (*Pinus*, *Leucaena*, *Gliricidia*, *Calliandra* and African *Acacia*) have only been successful because they were broadened into temporal and multi-disciplinary clusters. These clusters moved from taxonomic study through multi-country evaluation, research on silvicultural practices and uptake into land-use systems by a range of beneficiaries. There have been notable recent successes with work on forest ecosystem services (such as carbon and water) together with aspects of commercialisation of non-timber forest products (fruits, mushrooms, medicinal values) and work on certification, related to wider global concerns with sustainable management and control of the trade in illegal timber.
- 7.9.16 *Livestock Production Research Programme*: Emphasis in the current programme is on small-holder milk producers, crop-livestock farmers, small stock keepers, landless livestock keepers and pastoralists. Given the lack of adequate research in developing countries, it is difficult to identify any theme that should be dropped out of any future RNRRS. Rather, some changes in emphasis between themes within and between livestock keeper groups are suggested. Themes under dairy, small stock and crop/livestock keepers require relatively less intervention-related research and more effort on technology dissemination and uptake activities. On the other hand there is still research needed for the themes related to pastoralists and landless livestock keepers, which were incorporated into the LPP much later and have had limited time for implementation.
- 7.9.17 *Natural Resources Systems Research Programme*: The research undertaken in the NRSP have been organised in Uptake Promotion Nodes and in 3 suites in each node, in addition to a number of cross programme initiatives. The cross programme initiative should be expanded in with stronger focus on the environments in partner countries. The inclusion of socio-political environments should also be ensured at an earlier stage in the planning process for all projects.

7.9.18 Given these general guidelines, the following clusters may be the most robust for future support: the Bangladesh suites 1-3 which all feature projects with good potential for delivering empowerment and poverty alleviation through integrated land management strategies - research could be expanded to new countries; the Bolivia suite 2 which can make important contributions to scaling-up strategies - further progress on this issue is crucial for defending the role of research as a tool in poverty alleviation; East Africa suites 1-3 all of which have contributed to new knowledge, and for several projects also to capacity building and policy impacts in the region; India suite 1 which has important findings on policy processes and service delivery, and may be able to contribute more through involvement of social scientist and expansion to non agricultural sectors beyond aquaculture - this may also include the themes defined under the India suites 2 and 3; the peri urban Interface which has shown good results in India and some progress in Ghana - selecting categories of urban settlements in different ecosystems and political environments may contribute to expanding the understanding of this important development challenge.

7.9.19 *Plant Sciences Research Programme:* The four clusters reviewed (participatory crop Improvement cluster, the marker assisted selection, the seed priming and associated agronomy research, and the crop transformation cluster) have all yielded results of high scientific standards, and all warrant further research efforts. The highest achievement in scientific terms, which holds very high promise for the future, is the crop transformation cluster. However, unless public policies and regulatory mechanisms are favourable to research along these lines, the investments may not yield results that can be effectively disseminated.