

Chapter 6 Livestock Production Programme

Patrick H R Tawonezvi

6.1 SUMMARY

Key Issue	Key Findings
<p>Science Quality</p> <p>Quality of experimental design and analysis</p>	<p>Experimental design generally very good, mainly because project proposals were subjected to peer review. Not all project results assessed here had been analysed statistically, so the quality of the analysis could not be determined. However, the fact that the number of peer reviewed papers has been on the increase over the strategy period suggests that the experimental design and analysis were of good quality.</p>
<p>Contribution of projects sampled to new knowledge. Extent the projects use existing knowledge creatively in new contexts</p>	<p>Most of the projects sampled focussed on adapting existing knowledge to smallholder production systems. They were highly innovative and several elements of the research results were new knowledge.</p> <p>The research work improved steadily over the Strategy period, in terms of quality, pro-poor focus and relevance of the science.</p>
<p>Awareness of all current knowledge</p>	<p>Research collaboration with in-country scientists (including in-country CGIAR institutions) has been on the increase over the strategy period. This has helped increase awareness both among UK scientists of the current knowledge in the developing countries as well of the LPP within CGIAR institutions.</p> <p>The socio-science projects evaluated here are largely based on extensive review of literature and were well aware of most current knowledge.</p>
<p>Innovativeness and scientific risk-taking with comment on projects that are innovative and projects that are not.</p> <p>How risk was managed by programmes and project managers and the lessons from this</p>	<p>There is little evidence in the projects sampled of risky research having been undertaken, but it is understood that some risky research was undertaken in tsetse control projects conducted jointly with the AHP. This is discussed in the AHP report.</p> <ul style="list-style-type: none"> - The cluster of three projects (R6282/R7431/R7855) was particularly innovative in using existing knowledge of the nutritive value of various tropical forages and modern computer-based modelling to develop a new but simple dairy rationing system. - The adaptive research on DAP was also highly innovative in (i) adapting ox-drawn tillage implements for use by equines, and developing new participatory methodologies for linking technology supplies and demand in Bolivia, leading to development of demand-led technologies and prototype implements which were refined by an iterative farmer analysis and appraisal; and (ii) reduced use of human labour, improved margins and crop yields in Uganda. - A comprehensive study in India (R7633) with indigenous poultry developed a series of innovative technologies with potential for substantial improvement in productivity at village level.
<p>Address the issue of measuring science quality for applied projects with non-peer reviewed reports</p>	<p>Many of the project results were not published in peer reviewed reports. So in addition to any scientific publications, all projects were assessed for quality and relevance against the log frame on the basis of the results in the annual reports, workshop reports and project completion reports. They were also assessed in terms of their pro-poor focus and relevance of the technology to application by the poor.</p>

<p>Science Capacity Building</p> <p>Science capacity building in the south for both individuals and institutions.</p> <p>Include development of long-term institutional relationships between UK institutions and Southern institutions;</p>	<p>The share of the LPP projects led by developing country NARS scientists increased from 13% in 1999 to 47% by mid-2004. This capacity building is likely to enhance sustainability of project outputs in the South.</p> <p>The transfer of ownership and responsibility to southern partners has been promoted by appointment of in-country or regional coordinators each supported by an equivalent number of UK advisers. The aim was to leave behind:</p> <ul style="list-style-type: none"> (i) a sustainable in-country capacity to manage livestock research aimed at the needs of subsistence farmers, and (ii) knowledge, skills and aspirations inculcated in in-country personnel to pursue uptake of LPP research products'. <p>However, the ability of the LPP to build institutional capacity and influence individual country NARS from a few regional coordinators is likely to be very limited.</p> <p>Capacity has also been built in conducting research with a community focus, rather than the traditional disciplinary research focus, in developing tools and methodologies for such research as well as research management skills. These experiences are shared by NARS scientists at national and regional workshops.</p> <p>There has been a substantial increase in the number of empowerment workshops from 2001 in response to the need to focus on landless livestock keepers.</p> <p>Individual LPP projects have also contributed to science capacity building through provision to developing country NARS of various types of research equipment, which in many instances would otherwise not have been available through public funding.</p> <p>Although the LPP does not fund postgraduate studies directly, some 30 NARS scientists have used the research projects under LPP for MSc and PhD studies since 1999.</p> <p>LPP collaborates with various in-country stakeholders during project implementation. However, there is little evidence of strategies for long-term relationships having been deliberately planned, developed and promoted with national institutions in the South.</p>
<p>Knowledge Dissemination</p> <p>Adoption, lessons etc. from different approaches to dissemination and uptake promotion.</p>	<p>LPP has used the traditional routes for knowledge dissemination to the science and donor communities (i.e. through journals, conferences/workshops the Internet), has been developing toolboxes of knowledge directed at target institutions, and has produced information manuals, pamphlet, leaflets fliers, videos and radio programmes targeted at the smallholder farmers. Knowledge dissemination to the developing country policy audience has been mainly through workshops.</p> <p>While LPP has been quite successful in technology development and dissemination to the science and the international donor communities, uptake promotion and dissemination to the end-users have lagged behind, partly because these activities have not been adequately built into the individual projects during formulation and execution. Apparently, the expectation is that dissemination of research results to end-users will be the responsibility of national institutions, but there are no indications as to the strategies having been deliberately put in place by the national institutions to promote, monitor and evaluate adoption by end-users. Given the resource constraints of many national institutions in the South, LPP should in future focus much more on the technology dissemination, uptake promotion and adoption activities through direct collaboration with national livestock extension systems than has been the case in the last 10 years.</p>

<p>Management Approach</p> <p>Identify the lesson learning on identification of demand, relevant project design, appropriate dissemination and uptake pathways etc.</p> <p>Identify the lesson learning from different approaches in selecting and designing projects to achieve the purpose.</p> <p>Identify how the programme has evolved and become more demand driven.</p>	<p>In response to the change in DFID policy towards poverty reduction in 1998, LPP revised its log frame in 1998/99 to incorporate a new goal statement: 'Livelihoods of poor people improved through sustainably enhanced production and productivity in four production systems'. However, it took about two years for many UK scientists to accept the new changes and to translate the new poverty focus into project activities.</p> <p>In line with the poverty focus and the need to involve beneficiaries, LPP improved its project identification process over time. From 1999/2000, successful applicants of project concept notes were obliged to convene a stakeholder meeting in the beneficiary country in order to ensure that the project was demand-led, and to promote ownership of the research process and the research outputs. Subsequently, annual stakeholder meetings became a requirement.</p> <p>The project management appeared to have a strong input as to which project should be funded, with advice from the referees and the LPAC. Although there was no official policy as to the amount of funding for individual projects, analysis of project funding suggests that funding for individual projects was limited to less than GBP300 000. This means that there were many small projects conducted rather than a few large ones. This could have limited what research could be done.</p>
<p>Conclusions and Lessons for the Future</p> <ul style="list-style-type: none"> • Knowledge dissemination • Capacity building • Maintaining high science quality • Management • Research themes for the future 	<p>Knowledge dissemination and uptake promotion by national institutions and adoption by end-users have lagged behind during the Strategy period. The lesson for the future is not to leave knowledge dissemination activities and adoption by end-users entirely in the hands of the national institutions in the south in view of their resource constraints.</p> <p>Strong science capacity building efforts were made in terms of support to individual scientists in the south in research leadership and acquisition of scientific skills. However, there were very limited efforts on institutional capacity building necessary to ensure sustainability.</p> <p>There was strong evidence of growth in the quality of the science during the Strategy period. This growth was achieved mainly because knowledge gained over time was invested for further improvements in the performance of the programme. However, this growth was not even across livestock keeper groups or individual activities.</p> <p>The fact that LPP was quite able to reorient the Programme to the pro-poor focus in 1999 in spite of initial resistance by both UK scientists and some members of LPAC, and the fact that LPP was able to build on past experiences resulting in growth in the quality and relevance of the research, can be attributed to an able management. This together with the 10-year experience of the RNRRS gives DFID the comparative advantage over other donors in international support to natural resources research.</p> <ul style="list-style-type: none"> ▪ Intervention-related research and policy analysis in respect of the pastoralists and landless livestock keepers should be the main focus in the future. Further intervention related-research will also be necessary in small stock production and management and, to a lesser extent perhaps, for crop/livestock and smallholder dairy farmers. ▪ Promotion of technology uptake, dissemination and adoption of research outputs in a more focussed way than in the last 10 years in collaboration with the southern extension systems for a period of time long enough to ensure institutionalisation of the uptake to adoption process into the national livestock extension systems. ▪ Development of long-term relationships between the UK institutions and the R&D institutions in the South more deliberately than in the past.

6.2 ACHIEVEMENT OF PROGRAMME OUTPUTS (logframe in Annex 1)

Science achievement as per the log frame

The LPP goal will be the same for the entire RNRRS. The LPP programme purpose as stated in the current log frame is: 'Benefits for discreet groups of landed and landless livestock keepers generated by the application of new knowledge on the sustainable management of livestock in semi-arid, agro-pastoral, forest-agriculture, high potential and peri-urban production systems within an enabling environment'. At project level, the log frame is developed by completing the expected outputs and activities specific to that project. Table 1 gives the expected outputs and the corresponding indicators of achievements of the entire Livestock Programme. As only a sample of the projects was evaluated, the third column in Table 3.1 highlights the main achievements drawn from the sample.

Table1. Summary of science achievements versus log frame expectations based on analysis of sampled projects

Expected programme outputs	Expected science achievements	Highlights of science achievements (from sampled projects)
1. Strategies, technologies or policies which sustainably improve survival and/or productivity of livestock species of relevance to the livelihoods of poor livestock keepers developed, validated and disseminated.	By 2005, at least 12 technologies or strategies that meet identified needs of resource-poor livestock keepers developed and validated.	Technologies and strategies for smallholder dairy farmers, small stock keepers and crop/livestock farmers developed and validated, e.g. TP-D, bagged silage technique, DAP technologies, egg storage and candling techniques, and milk marketing, processing and hygiene.
2. Basket of new technologies, decisions support strategies and policies developed to improve survival and productivity of livestock species kept by resource-poor livestock keepers, taken up and promoted by target institutions.	By 2005, at least 6 baskets of knowledge of relevance to poor livestock keepers (e.g. DAP, dairy rationing, dry-season interventions, nutrition /disease interactions, small stock husbandry) taken up by target institutions and promoted	<p>Technologies developed contributing to knowledge baskets now being packaged into tool boxes of technology, policies and extension materials. Draft versions of tool boxes completed for small stock keepers, DAP users, and dry season feeding options.</p> <p>Decision support tools developed for pastoral R&D.</p> <p>Development of techniques for appropriate extension dialogue with the urban landless near completion.</p> <p>Guidelines on dairy feed rationing (TP-D) developed and disseminated to target institutions and farmers.</p> <p>Information on processing, marketing and safety of milk developed and promoted in collaboration with FAO.</p>

Expected programme outputs	Expected science achievements	Highlights of science achievements (from sampled projects)
3. New knowledge adapted and adopted and its impact on livelihoods assessed locally	By 2006, evidence presented of adaptation and adoption of components of 6 baskets of knowledge. Provisional evidence presented of impact of adoption of new knowledge on livelihoods at the local level.	New knowledge listed above being promoted and adopted to different degrees. Impact still to be assessed.
4. Approaches to scaling-up of strategies, technologies and policies which improve livelihoods of poor livestock keepers investigated and disseminated to appropriate target institutions	By 2006, at least 4 new adopted knowledge baskets with positive impact on the livelihoods of the poor scaled-up at higher than district level.	Knowledge for the different livestock keeper groups and production systems now available in form of a textbook, draft knowledge toolboxes, manuals, pamphlets, etc. But gaps still exist, especially for the landless groups. Uptake strategies developed for some technologies and being adopted by target institutions.

Evaluation of the individual projects shows that the log frame was used as the point of reference in implementation of the projects. Outputs were reported in the context of the original objectives of the log frame of the project, and these outputs were consistent with the expected outputs of the overall Programme. Therefore, the log frame was an extremely useful tool in guiding the individual projects and the entire Programme. Table 3.1 suggests that the level of science achievement has been high when assessed against log frame expectations for outputs 1 and 2, but much more needs to be accomplished in dissemination and uptake of the research results (outputs 3 and 4).

The expected programme outputs 1 and 2 in Table 3.1 are realistic and the corresponding indicators of science achievement are objective and readily measurable as shown in the second column of the Table. The indicators under outputs 3 and 4 are useful in respect of their intention to assess level of technology adoption, programme impact and achievement. However, such indicators need baseline values. Therefore, measurement of the indicators needs to be defined and a baseline set. In this regard, a clear M&E mechanism is necessary. According to the log frame, independent in-country assessment will be carried out to determine achievement of outputs 3 and 4, but there is no indication that the information needed for such assessment is being collected.

One important aspect of the log frame is how realistic the assumptions are. Three assumptions in the LPP log frame are noteworthy, namely, that:

- Local research teams have adequate resources to conduct collaborative activities.
- Local and national target institutions have adequate resources to take-up and promote research outputs, and
- Sufficient co-ordination with in-country and other institutions exists to fund the scaling-up process.

Without donor support, many developing countries are not likely to have adequate resources to sustain in-country collaborative research activities and to promote technology uptake and dissemination. The validity of these assumptions is doubtful in some circumstances and there is the real risk that the outstanding technology uptake and dissemination activities will not continue after termination of the RNRRS. For this and other reasons, extension of the Programme is recommended as explained in paragraph 55.

Achievement was also assessed in terms of each project's current level against the designed level on the A – H uptake scale of DFID, based on the information on the project matrix compiled by the project management (Table 2).

Table 2. Designed and current levels of individual projects on the A - H uptake scale

Designed uptake level		No. of projects, by current uptake level ¹								% projects at full uptake level
Uptake level	No. of projects	A	B	C	D	E	F	G	H	
A	3	3								100
B	2		2							100
C	8			8						100
D	21		1	5	15					71
E	17		1	1	7	8				47
F	7			1	2		4			57
G	22		1		2	5	5	9		40
H	16			1			5	1	11	70

¹A = Generation of relevant research results, B = Formal/informal agreement with target institutions, C = Development of appropriate research-based products through adaptation/packaging, D = Promotion of products into target institutions, E = Adoption of products by target institutions, F = Application and replication of results in target institution programmes, G = Promotion of technology or behavioural change among end-users by target institutions, H = Adoption of technology by end-users and generation of economic benefits i.e. developmental impact

Table 2 includes both completed and on-going projects, so not all projects will have reached the ultimate stages on the uptake scale. However, the Table provides indicative progress on the uptake scale, given the limited time left for the research strategy. Except for projects intended for the E and G uptake levels, most projects either have attained their ultimate uptake levels or are on the higher levels of their individual scale. So Table 2 suggests high achievement by LPP in technology development, its adaptation and packaging (level C), and in promoting research results to target institutions (level D). However, adoption of research products, their application, replication and promotion by the target institutions (levels E to G) have been less successful to date. The analyses in Tables 3.1 and 3.2 indicate that, while LPP has been highly successful in developing relevant technologies, substantial work with the national target institutions responsible for livestock research and extension still needs to be carried out to promote uptake and dissemination of the research outputs to end-users.

6.3 BACKGROUND

Introduction

The Livestock Production Programme (LPP) is managed under contract by the Natural Resources International Ltd. (NR International). Since 1995, LPP work was conducted in 13 DFID focus countries in Africa (Ethiopia, Ghana, Kenya, Tanzania, Uganda and Zimbabwe), Asia (Bangladesh, India and Nepal) and Latin America (Bolivia, Brazil, Colombia and Mexico). Until 1998, the programme focussed on increased livestock production and productivity through improved supply and value of livestock products as well as improved contribution of livestock to crop production in four production systems: semi-arid, peri-urban, high potential and forest/agriculture interface. Following changes in the RNRRS to focus on poverty reduction in 1998, the LPP programme was revised to focus on improved livelihoods of five resource-poor livestock keeper groups, namely, smallholder milk producers, crop/livestock farmers, small stock keepers, landless livestock keepers and pastoralists. These livestock farmers subsist under the same four production systems as those prior to 1998, except that the peri-urban production system was extended to include urban livestock farmers. The four production systems generally cut across livestock keeper groups, except that research has been commissioned in the arid rangeland production system on pastoralists. Research themes depend largely on the livestock keeper group. The main research themes are:

- **Small-holder milk producers:** appropriate rationing systems; conservation practices; milk processing and marketing; use of improved local breeds and exotics for milk; lifetime vs annual production indices.
- **Crop-Livestock farmers:** feeding draught animals for work; appropriate harnessing and yoking systems; appropriate primary and secondary cultivation implements; contribution of dung to soil fertility; tsetse (and trypanosomosis) control; animal welfare.

- **Small stock keepers:** Research themes: dry-season interventions; nutrition-disease interactions; coping with worm burdens; control of production diseases; indigenous approaches to feeding and disease; appropriate husbandry (feeding, housing, disease control) practices; products (meat, eggs, skins, dung) to market.
- **Landless livestock keepers:** policy change and creation of enabling environments; gender issues; empowerment of the poor.
- **Pastoralists:** policy change and awareness raising; land use and tenure; empowerment; markets and marketing.
- **Cross-cutting:** research which had generated information of a generic nature not currently of direct relevance to any of the fore-mentioned keeper groups and research on information management and communication, and on empowerment and gender.

Programme focus and changes over time

Prior to 1998, LPP's research was largely commodity-based and researcher-driven, the principal aim being to provide technologies that would result in efficient production of livestock commodities for the four production systems. Although the projects were not designed with a poverty focus, some had poverty reduction elements. These include most of the projects on smallholder milk production and on draught animal power.

LPP took a number of steps in response to the policy changes and to lessons learnt during programme implementation:

- In response to the change in DFID policy towards poverty reduction in 1998, LPP revised its log frame in 1998/99 to incorporate a new goal statement: 'Livelihoods of poor people improved through sustainably enhanced production and productivity in four production systems'. However, some of the UK scientific institutions were reluctant to accept the new poverty focus, including apparently some members of the LPAC. It is understood that there was approximately a two year time lag before the new poverty focus translated into project activities reflecting this new goal statement.
- A more pro-poor interpretation of the term livestock was instituted to encourage research proposals on small stock species kept by poor people. For commodity-based projects that continued after 1998, elements and outputs were re-packaged with a poverty focus.
- In order to make projects demand led, LPP promoted multi-institutional and multi-disciplinary project teams. Successful applicants of concept notes were obliged to convene a stakeholder meeting in the beneficiary country in order to promote ownership of the research process and the research outputs. From 1999/2000, participation of stakeholders (farmer representatives, target institutions, research collaborators and policy makers) in project formulation became mandatory, had to be demonstrated for the project to receive funding and annual stakeholder meetings became a requirement.
- From about 1999/2000, the Programme clustered the target farmers into the current livestock keeper groups in order to facilitate appropriate packaging of research outputs to targeted farmers groups and to ensure that research was people-focused rather than commodity-focused. At the same time, LPP recognised that the needs of the poorest livestock keepers (the landless and pastoralists) had been hardly addressed. So the call for research concept notes from 2000/01 sought to address the needs of these farmer groups. Consequently, projects and workshops have been conducted in recent years directed at policy and empowerment of the landless urban livestock keepers and pastoralists.

6.4 SAMPLING AND METHODOLOGY

The objective of this study was to evaluate the science aspects of the LPP. Other aspects of the programme are evaluated elsewhere. About 118 competitively won projects have been conducted by LPP since 1995 and this includes projects which were inherited by the new programme at the beginning of the new strategy. These comprise 19 projects (16%) in Latin America, 21 projects (18%) in Asia and 78 projects (66%) in Africa. In addition, LPP has commissioned over 70 programmes development activities.

In view of the large number of projects, this evaluation selected a representative sample for detailed study. Sampling was stratified within keeper groups, and the projects selected represented those that were highly successful in contributing knowledge and meeting their stated objectives, those that were reasonable failures but provided important lessons, and projects that fell in between the two extremes. This selection was done in consultation with the programme management. Some projects were a cluster of initial and follow-up projects under the same theme. Where this was the case, all the projects under that cluster were included and evaluated together. A total of 34 projects were included in the evaluation (Table 3) and these covered all the livestock keeper groups and the production systems across the 10-year Strategy period. Another 6 projects among those classified by LPP as ‘Global Public Goods’ were also considered. These are projects designed to develop methodologies on application or evaluation of technologies not associated with a particular livestock keeper group. This gives a total of 40 projects evaluated, or about one-third of the total project portfolio.

Table 3. Livestock projects selected for detailed evaluation

Livestock keeper group	Assessed achievement category	Production system	Project/cluster	Implementation period	Country project conducted/relevant
Smallholder milk producers	High	High potential	R6282/R7431/R7855	1998-2003	Bolivia, Brazil, Kenya, Tanzania
		Semi-arid	R7010	1997-2003	Zimbabwe
	Medium	Peri-urban	R7321	1999-2001	Ghana, Tanzania
		High potential	R7339/R6610	1995-2004	Bangladesh
	Low	Semi-arid	R6993	1997-2002	Zimbabwe
		Forest/agric	R6606	1996-1999	Bolivia
Crop/livestock farmers	High	Forest/agric	R6605/R6970/R8182	1996-2005	Bolivia
		Semi-arid	R7401	1999-2004	Uganda
	Medium	Semi-arid	R6953	1997-2003	India
		Forest/agric	R7637	2000-2004	Nepal
		Forest/agric	R7376	1999-2001	Bolivia
		Forest/agric	R6774/ZC0198	1996-2003	Bolivia
Small stock keepers	High	Forest/agric	R6774/ZC0198	1996-2003	Bolivia
	Medium	Peri-urban	R7524	1999-2003	Zimbabwe
		Semi-arid	R7351	1999-2003	Zimbabwe
Low	Semi-arid	R6954/R7424	1997-2003	Tanzania	
Landless livestock keepers	High	Peri-urban	R8110	2001-2004	Bolivia, Kenya, India
		Peri-urban	ZC0201	2002-2003	Ethiopia, Kenya, Tanzania Uganda
	Medium	Forest/agric	R8109	2001-2004	Bangladesh, Nepal
	High		R7402 ZC0256	1999-2001	Bolivia, Kenya, India
Pastoralists	High	Semi-arid	R7050, ZC0240	1997-2001	Tanzania
	Medium		R6341	1995-1998	East Africa
	Low		R6618	1996	Semi-arid Africa

Literature provided by DFID and project management was reviewed. Discussions were held with project management and 7 project scientists met in the UK. The Programme’s performance was evaluated on the basis of all the information collected and on the detailed analysis of the 40 selected projects indicated above.

6.5 SCIENCE QUALITY

Programme's contribution to knowledge

Smallholder milk production: The smallholder milk production system is the largest system after the crop/livestock system in terms of the number of projects. A total of 11 projects focussing on smallholder milk production were selected for the present evaluation. These covered fodder production and conservation, ration formulation for dairy animals utilising locally available feeds, strategic use of crop residues, planted fodder and other conserved feeds to minimise shortages and feed quality constraints during the dry seasons, as well as marketing of milk and milk products.

Much of the research was based on the use of existing knowledge, testing and adapting it to tropical and smallholder conditions. Some of these projects were highly innovative and some elements of the research results were new interventions. In particular, the cluster of three projects (R6282/R7431/R7855 in Table 1.1 above) was able to use existing knowledge of the nutritive value of various tropical forages and modern computer-based modelling to develop a new but simple Dairy Rationing System for the Tropics (DRASTIC) with a very high level of accuracy in relating the composition of the ration formulated to the expected milk yield. DRASTIC was further developed into a simple pictorial system (Talking Pictures – Dairy (TP-D)) that guides decision making in dairy feeding by smallholder farmers or their extension advisers. Evaluation of TP-D in India, Kenya and Tanzania indicated over 90 % acceptability by smallholder farmers and a potential 25 % increase in milk yield by herds adopting the technology. Fodder production and conservation research conducted in semi-arid areas of Zimbabwe led to the development of the technology of making silage in bags, a new approach much easier for smallholder farmers to manage, less labour intensive and less wasteful of feed than the traditional bulk storage silage-making system. This research is now being taken up by the national Dairy Development Programme and has led to policy change promoting smallholder milk production in hitherto neglected semi-arid areas of the country. It is understood that the bagged silage technique is now beginning to be adopted in other countries in the region.

There were some reasonable failures, however. The project (R6993) to identify losses in nutrients in stover harvested and stored under traditional practice compared with stover under improved harvesting and storage practices yielded inconclusive evidence of improved nutritive value or reduced mycotoxin contamination levels in the stover stored under improved structures. The researchers, however, gained greater understanding of the farming systems and feed storage practices in the project areas. The socio-economic and participatory aspects of the project increased understanding of the potential usefulness of storage of dry season feeds to smallholder dairy producers. Similarly, the project (R7459) designed to develop seasonal nutrition and resource management strategies for smallholder dairy systems in Bolivia and Kenya yielded little research outcomes at least in the short-term (despite the 32 publications produced from the work). This project emphasises the contrast which sometimes occurs between scientific outputs and development impact.

Crop/livestock farming: This is the largest farming system in terms of the number of projects and studies conducted, accounting for 40 % of the project portfolio. Most projects for this farming system were on draught animal power (DAP), general nutrition and management interventions, and tsetse fly and trypanosomosis control in collaboration with the Animal Health Programme (AHP). DAP projects focussed mainly on husbandry (nutrition, health, and housing) of draught animals, animal welfare and development of suitable implements. The feeding management projects were similar to those discussed under smallholder dairying in that they focussed mainly on strategic use of crop residues, planted fodders and other conserved feeds to minimise shortages and feed quality constraints during work or the dry season for draught animals and other livestock. Eight projects dealing with DAP and livestock feeding management were selected for detailed evaluation.

The unwritten understanding between AHP and LPP regarding tsetse control and trypanosomosis has been that LPP take the lead in commissioning tsetse control projects and AHP the lead in commissioning projects on trypanosomosis. As a consequence, LPP has commissioned a large number of projects that have generated tsetse control techniques and processes relevant to individual farmers, communities and at national level. Whereas these have been successful within a project context, they have not been sustainable in the long-term due to the lack of joint national strategies which can attract major funding. However, in November 2004, the African Development Bank approved a US\$ 67 million loan to utilise appropriate tsetse control and eradication strategies (largely developed as a consequence of the £25 million investment by the LPP and predecessor research programmes) to eradicate sleeping sicknesses and “ngama” in 180,000 km² in six sub-Saharan countries. The first phase of the campaign will utilise many of the research and technical staff trained under LLP projects.

The intention is to release 13 million hectares of land and positively impact on 15 million people. Unfortunately these research findings have not influenced the African Development Bank's Tsetse Eradication Campaign, which appears to be wedded to a high technology approach.

Much of the research was again based on adapting existing knowledge. Research contribution to knowledge in animal traction included:

- Adapting ox-drawn tillage implements for use by equines in Bolivia, thus making animal traction more accessible to resource-poor farmers
- Development of new participatory methodologies for linking technology supplies and demand in Bolivia, leading to development of demand-led technologies and prototype implements which were refined by an iterative farmer analysis and appraisal.
- Developing feeding systems for draught animals for increased work output. The improved feeding and management systems also resulted in increased working life of draught oxen thus reducing replacement costs.
- Compared with hand weeding in Uganda, DAP weeding was shown to require substantially less human labour, produce higher yields, reduce costs, improve margins, increase returns to hand-weeding labour, and reduce drudgery particularly for women who would normally provide most of the hand weeding labour. Farmers using three types of DAP weeders developed by the project increased their area under cultivation, thus enhancing household food production.
- Increased emphasis on the welfare of draught animals, particularly donkeys used for work on farm and in brick kilns, has raised the profile of this issue with local communities, attracted public attention and some new research funding (e.g. the Brooke Hospital).

Supplementation of basal diets with pods of locally available fodder trees in a semi-arid crop/livestock system in India (project R6953) accelerated sexual maturation in indigenous goats, increased conception rate and kidding rate. This fertility improvement would potentially contribute to increased offtake rates of goat milk and meat per unit of land and enhance household food security. Pods of a local creeper (*Mucuna pruriens*) were found to be as effective as commercial anthelmintics in controlling internal worms in pregnant does. A project (R7637) has successfully integrated indigenous and biological knowledge on fodder trees to increase feed production in mixed farming systems in Nepal where landholdings are small and grazing is limited. This project is now in the process of developing a decision support tool for use by farmers and their extension advisers.

Small stock keepers: A total of eight projects were evaluated under this livestock keeper group, covering the whole range of production systems and regions. Socio-economic studies employing participatory methodology in Bolivia (R6774 and ZC0198) provided new information in the country on the importance of small stock (poultry, sheep, pigs, guinea pigs) to poor communities and identified the constraints and opportunities to increased production and productivity, as well as potential solutions to the constraints. The information was then developed into recommendation packages, which were tested in on-farm validation work. The project attracted the attention of local and national government authorities and has led to the development of small animal species in four new provinces where the municipalities have provided funds for extension agents to act under the technical guidance of CIAT. Based on the results of this project and with CIAT assistance, a series of extension leaflets and extension booklets have been produced, covering animal health, husbandry and feeding of poultry, sheep, pigs and guinea pigs. The project has been highly successful in that it has provided new knowledge in Bolivia and opened considerable opportunities for research and development of hitherto neglected animals on which most resource-poor rural communities in the country depend. Although the technologies developed within this livestock keeper cluster were in a landed environment, it is likely that a number of them would also be appropriate for landless householders.

A comprehensive study in India (R7633) with indigenous poultry developed a series of technologies, which include:

- The use of candling lamps as an intervention to identify infertile or damaged eggs early in the incubation period, thereby making such eggs available for human consumption or sale. Prior to this technology, such eggs were thrown away due to spoilage from bacterial infection. It is estimated that the introduction of the candle technology has reduced egg losses by 25% in the participating communities.
- Development of an egg cool-storage technique that reduces embryo mortality and improves hatchability by 30 – 50% in summer, a season when hatchability is otherwise low.

- Identified two locally grown plants (Hamagrass seed – *Achinocloa column*, and Kali Jiri – *Centritherium anthelminticum*) as having anthelmintic properties. The use of these plants reduces the incidence of gut parasites and increases weight gains and survival rates of chickens.
- Following the project's on-station studies, in which tannin-rich red sorghum performed better as poultry feed than white sorghum, the use of red sorghum as a supplementary creep feed has increased in Tamil Nadu, with an estimated increase in productivity of 20% being achieved by participating farmers.

The technologies developed by the other projects evaluated under this livestock keeper group are however less spectacular, especially when assessed against relevance to the resource-poor small stock producers. The use of oilseed cake from small-scale processing operations in poultry and small ruminant rations in Zimbabwe (R7524) showed the effectiveness of the cakes as a protein-rich feed for growing animals and birds and as a substitute to commercially prepared protein concentrates. But in view of the limited availability of the cakes due to the limited production and processing of oilseeds among resource-poor farmers in rural communities in the country, application of this technology by these farmers is likely to be limited. Three projects (R6954, R7351 and R7424) form a cluster evaluating the use of tannin-rich acacia pods and natural browse generally as small ruminant feed in semi-arid areas. This cluster of projects, as well as project R6341 on identification of nematode-resistant sheep, were initiated before 1998 when projects were largely researcher-led and disciplinary research was the main focus. Recent studies have shown conclusively that sheep (but not goats) drenched with tannin extracts show very marked reductions in worm numbers; the species difference may be associated with the dietary differences of sheep and goats. However, while the research conducted is sound, the value of the science to the resource-poor smallholder livestock keepers appears limited at present. Rather, it is the large scale producers more likely to benefit from such research.

Landless livestock keepers: Only two research projects (R8109 and R8110) and an urban livestock development scoping study (ZC0201) have been conducted by LPP on truly landless keepers. These are recent and still on-going projects initiated in 2001 after the policy decision was made to focus on this farmer group. Assessment to date indicates that these projects are making a considerable contribution to science knowledge on the landless. Project R8109: *Using livestock to improve the livelihoods of landless and refugee-affected livestock keepers in Bangladesh and Nepal*, has to date produced a synthesis report on the aspirations and constraints of landless livestock keepers. The report is intended to make the insights of the project accessible to stakeholders and policy makers in both countries. Information on over 70 NGOs and other organisations has also been compiled to provide a baseline and stakeholder list for active dissemination in the future. Participatory evaluations have been conducted of eight outputs that have addressed livestock and the landless. Project R8110: *Livestock and urban livelihoods: developing appropriate extension dialogue with the landless*, has to date identified and tested pathways for uptake of livestock extension dialogue and has created a forum for linking agents and actors working in urban livestock production at local and national levels. The project has initiated stakeholder consultation groups at national and state levels in both Pondicherry and Tamil Nadu (India) and in four slums in Nairobi (Kenya). The project has also developed initiative interactive learning aids such as ICTs (Information Communication Technologies called 'Livestock Guru' in India, 'Daktari' in Kenya and 'El Promoter' in Bolivia) in local languages which enable farmers and other practitioners to identify appropriate animal health and husbandry issues which affect their livestock and livelihoods remotely, for the first time. Partnerships with knowledge users, knowledge generators, knowledge implementers and drivers of livestock development knowledge have been created in the three countries. The livestock development scoping study (ZC0201) in Ethiopia, Kenya, Tanzania and Uganda, identified the major concerns of the urban livestock farmers. These concerns included the legality of livestock keeping in urban areas and irrational harassment by city authorities, lack of extension advice mainly as a result of lack of recognition by authorities of urban livestock farming, lack of access to credit, poor access to clean water, poor sanitation and dangers of zoonotic diseases among the slum dwellers, and poor animal health and feed supplies. The scoping study has therefore been extremely useful and should inform future policy research and development for these urban farmers.

Pastoralists: Three projects and three studies were selected for this evaluation. Project R7402: *The development of decision support tools for restocking projects*, has been perhaps the most outstanding piece of research work under this livestock keeper group. The research is ranked highly successful in putting together information to enhance the effectiveness of restocking projects and programmes contributing to long-term improvements in the livelihoods of poor pastoralists. From the results of this project, a 'best practice' and decision support manual was developed and published in 2004, entitled: *Restocking Pastoralists: a Manual for Best Practice and Decision Support Tools*. This manual provides a participatory toolkit and guidelines for implementation of projects as a form of relief, rehabilitation and development of pastoral communities.

The study ZC0256 carried out in Ethiopia, Kenya and Uganda showed the potential for Livestock Parliamentary Groups (i.e. groups of Members of Parliament with constituencies in pastoral areas or concerned with pastoral development) to influence policy for pastoral areas. The study suggested that well targeted LPP support to Livestock Parliamentary Groups in promoting policy development for pastoral areas can have a significant impact on pastoral livelihoods. The LPP recognises in its 2003/4 annual report that, although there is evidence that further interventions-related research to deal with problems experienced by pastoral and transhumant communities would be worthwhile, there is insufficient time left under the present RNRRS to commission research and studies directed at interventions. Unless the Strategy is extended, therefore, substantial outstanding research needed for development of pastoral communities (as well as the landless livestock keepers) will not be carried out. This will leave important knowledge gaps.

The other projects evaluated under this livestock keeper group focussed on activities contributing relatively less to pro-poor pastoral science and covered a wide range of unrelated topics. These are older projects developed before the new thrust to empower the landless livestock keepers.

Overall, LPP's research contribution to knowledge has been high. Much of the research was based on the use of existing knowledge and adapting it to smallholder production systems. Some of these projects were highly innovative and several elements of the research results were new knowledge. The evaluation also shows that LPP's research work has improved steadily over the Strategy period, in terms of quality, pro-poor focus and relevance of the science. This indicates that the experience gained by the scientists and the programme management was used effectively in the development of the programme.

Science risk-taking

There is little evidence of high risk research having been undertaken, but it must be noted that LPP has taken the bold decision in its research programme to tackle livestock policy, land tenure and empowerment issues in respect of the often marginalised pastoralists, landless livestock farmers and urban livestock keepers. Such policy issues have generally been avoided by both national and international research institutions in the past, mainly because of their sensitive nature, yet policy rather than technology is sometimes the major constraint to livestock development among poor communities.

Awareness of current knowledge

The LPP projects comprise experimental work with livestock and laboratory studies, as well as socio-science projects, looking at developing more effective extension methods to enhance technology uptake. The socio-science projects are largely based on extensive review of literature, in addition to carrying out research and testing new concepts. These projects are well aware of most current knowledge. Research collaboration with in-country scientists (both in NARS and in the CGIAR system) has been on the increase (see Table 3.2) and this has helped increase awareness among UK scientists of the current knowledge in those developing countries with which they collaborate. Secondly, information and literature are shared in the annual and regional workshops conducted by LPP. Thirdly, some of the projects have been used by national scientists for their post-graduate studies, which require substantial review of literature from various sources.

One constraint worthy of note, however, is the limited ability of NARS in many developing countries to publish their annual reports owing to public budget limitations, which means that local research information largely remains in the station files and is not readily accessible to the international scientific community, the outreach and end-users. DFID could perhaps support the NARS in the production of livestock annual reports and commission review studies and reports of donor and NGO funded projects, so that all livestock development work gets into the public domain. In this respect, it is understood that currently, LPP is supporting a study to search and review all work carried out over several years to 2004 by government stations, donors and NGOs in Zimbabwe and to fish out pro-poor elements on dry season livestock feeding (ZC0236). Such information would contribute to awareness of current knowledge in the country.

6.6 SCIENCE CAPACITY BUILDING

Science capacity building in developing countries

LPP's contribution to science capacity building was assessed in terms of the involvement of developing country NARS scientists and extension agents in the LPP research programme and training. Of the total project portfolio during the entire Strategy period, about 23 % of the projects were led by NRI, 44 % by other UK institutions, 11 % by CGIAR centres and 22 % by the NARS in the developing countries. Thus overall, UK institutions including NR International itself (activities led by NR International are either programme development or dissemination focused as NR International does not lead on any research projects), have led implementation of two-thirds of all the LPP projects. However, the share of the LPP projects led by developing country NARS scientists has increased substantially every year since 1995, with about one-half of the LPP projects led by in-country scientists in 2004 (Table 3.4). This is capacity building, which is likely to enhance sustainability of project outputs.

Table 4. Capacity building assessment

Year	No. of projects	% led by developing country NARS	No. of workshops ¹		Postgraduate theses	No. of publications	
			Training	Empowerment		Peer reviewed	Others
2004 (1 st 6 months)	30	47	4	4	1	55	86
2003	39	43	14	15	1	34	165
2002	28	32	10	3	2	40	175
2001	36	19	10	1	10	44	200
2000	39	15	14	5	8	70	178
1999	38	13	9	4	7	16	8
1998			4	2		7	13
1997			8	2		3	10
1996			5	0		2	2
1995			6	0		0	1

¹Empowerment workshops bring together livestock scientists, NGOs, policy makers and other stakeholders, while training workshops are mainly concerned with technology development, with scientists and NGOs presenting their research findings and learning.

The transfer of ownership of responsibility to the southern partners has been promoted further by appointment of in-country or regional coordinators. The programme has five coordinators based in Latin America, Eastern and Southern Africa, and Asia. Each of these is supported by an equivalent number of part-time UK advisers in a capacity building as well as a strategic role for the programme. According to the LPP, the aim is to leave behind '.....a sustainable in-country capacity to manage livestock research aimed at the needs of subsistence farmers. It will also leave behind knowledge, skills and aspirations inculcated in in-country personnel to pursue uptake of LPP research products' However, the ability of the Programme to build such capacity and influence individual country NARS from only five coordinators is likely to be very limited.

LPP has contributed significantly to the capacity of the developing country NARS scientists in carrying out research in the diverse and seasonally variable environments outside the laboratory and the research stations. Capacity has also been built in conducting research with a community focus, rather than the traditional disciplinary research focus, in developing tools and methodologies for such research as well as research management skills. These experiences are shared by NARS scientists at the national workshops and regional training workshops conducted by the LPP. Table 3.3 indicates that following the revision of the Programme in 1998 focussing on poverty and the new output on dissemination and promotion of pro-poor technologies, there has been rapid growth in training activity from 1999. Similarly, there has been a substantial increase in the number of empowerment workshops from 2001 in response to the need to focus on landless livestock keepers.

Individual LPP projects have also contributed to science capacity building through provision to developing country NARS of various types of research equipment (e.g. field vehicles, computers, laboratory equipment), which in many instances would otherwise not have been available through public funding. Although the LPP does not fund postgraduate studies directly, some NARS scientists have used the research projects under LPP for MSc and PhD studies. To date about 30 NARS scientist have acquired post-graduate degrees since 1999.

A total of 1,109 publications have been produced by LPP to date and many of these are co-authored by scientists from partner institutions in the developing countries, thus building their capacity for scientific analysis and reporting. About 24 % of the publications in Table 3.3 are reported by LPP as having been peer reviewed, with some of the papers submitted to refereed journals. This evaluation has however observed that while a number of papers are reported annually as having been submitted to refereed journals for publication, there is uncertainty on the tracking of papers published after project completion. Some project leaders update LPP on papers emanating from closed project but there is no formal procedure. Many scientists would normally prepare papers for journal publication long after project completion. Therefore, the number of papers from LPP work eventually published in refereed journals is largely unknown. Programme managers will need to develop a follow-up system that ensures that papers published after project completion get reported in order to reflect more accurately the output and achievement of this activity.

Building of a long-term relationships between UK institutions and Southern institutions

LPP collaborates with various in-country stakeholders during implementation. However, there is little evidence of strategies for long-term relationships having been deliberately planned, developed and promoted with national institutions in the South. Many people interviewed could not come up with examples of actual long-term linkages developed. This is perhaps not unexpected because many individual projects are short-term, about three years. Many interviewees, however, felt that long-term linkages will depend on staff stability in the collaborating NGOs and in the developing country NARS: staff movement within NGOs tends to depend on changes in donor funding, while staff changes due to attrition and promotions in developing country NARS can be substantial. Indications are that efforts are being made to develop strategies for long-term relationships as illustrated through efforts on scaling up of clusters of project outputs with in-country institutions, particularly NGOs and the NARS. Long-term linkages will, however, probably develop from the following:

- Some of the projects carried out under LPP have opened new research questions leading to new research proposals submitted to LPP or other donors. This is expected to result in longer-term interaction between the UK and the developing country scientists.
- Joint publications after project completion tend to extend the period of collaboration, because of the often long time periods from submission and publication of scientific papers in refereed journals.
- Links will probably be strong and longer-term at personal rather than institutional level because it is often easier to work with researchers that one knows from previous collaboration.
- Development of a project performance evaluation system carried out, say, 2-3 years after project completion, may be useful to maintain linkages and to evaluate the usefulness and sustainability of outputs of some of the individual projects or project clusters.
- Although the LPP has a newsletter, contribution by individual scientists seems to have been small. Long-term linkages could be promoted through a more focussed information sharing and exchange system where past and present beneficiaries of LPP funding can continue to share and exchange ideas and experiences long after completion of their projects.

6.7 KNOWLEDGE AND DISSEMINATION

Knowledge dissemination to the science community

LPP has used the traditional routes for knowledge dissemination to the science community, i.e. through journals, conferences/workshops, as toolboxes of knowledge to help people in different research and development institutions, through annual reports and project completion reports. These reports are also available on request to the science community as hard or electronic copies or on CDs. Virtually all LPP documents have been posted on the programme's website. In addition, LPP has a mailing list for its annual reports. Based on the research conducted to date and the experience gained, LPP has financed preparation of a new book for developing country universities and colleagues teaching animal science of relevance to local needs, entitled "*Livestock and Wealth Creation: improving the husbandry of animals kept by resource-poor people in developing countries*" which will be published in March 2005. Thus LPP's knowledge dissemination to the science community is very commendable indeed.

Knowledge dissemination to developing country policy audience

Knowledge dissemination to the developing country policy audience has been undertaken mainly by inviting policy makers to empowerment workshops and involving them in project discussion meetings. The latter covering issues from project formulation, implementation to presentation of results. These forums have been useful in informing the policy audience of the research results and uptake strategies. They have also been useful in promoting interaction and

dialogue with policy makers and implementers, a process expected to result in development of improved policies for pro-poor livestock development.

LPP has however recognised the need for information dissemination and interaction targeted more specifically at the policy audience. In its latest management contract, LPP puts particular emphasis on the need during the contract period to address livestock policy and to promote interaction with policy makers. This emphasis is however mainly in the context of the need to promote development of policies that benefit the landless livestock keepers in urban and pastoral areas. In this context, LPP has been working on creating innovative ways to interact with policy makers. It has interacted successfully with the Livestock Parliamentary Groups in East Africa. It has collaborated with the CGIAR Urban Harvest Programme in Kampala, bringing together representatives of urban farmers, policy makers at city and national levels, civil society groups, researchers and donors, a process which has facilitated change in city by-laws giving rights to city farmers.

Experience in developing countries indicates that the absence of appropriate policies is, in many instances, the major constraint to livestock development generally than production technology, in terms of lack of adequate human capital support for research and extension, poor remuneration and lack of adequate budgetary support, as well as the general poor policy environment for smallholder farmers in terms of livestock production and marketing. In addition, livestock policy is managed and implemented by various players from the district agricultural offices to the national level. So in developing and implementing new policy strategies, it will be necessary to engage appropriately the different levels. Therefore, future policy research and dissemination need to cover the whole range of the policy audience and many more issues than the political problems of the landless.

Knowledge dissemination to developing country outreach

In terms of knowledge dissemination, the RNRRS expects all programmes to work with target institutions which that have shown willingness to take up the products of research and engage in the process of transferring knowledge to the beneficiaries. The target institutions are therefore the ones with the primary responsibility to utilise the results of research to achieve development impact. Consequently the performance of LPP in knowledge dissemination to the developing country outreach is assessed primarily in terms of its level of collaboration with target institutions, and how these institutions have accessed and transferred knowledge.

Since, 1998 when the RNRRS focus changed towards poverty alleviation, the main route for knowledge dissemination by LPP to the developing country outreach has been research collaboration with target institutions built in to the new programme focus, with the target institutions, particularly NGOs, CBOs and the national extension systems, being part of the demand-led project development and execution. Secondly, the new programme requirements for projects to conduct annual stakeholders meetings provides a platform to inform and involve outreach institutions not directly involved in the project about the project formulation and implementation processes as well as the results achieved. This has promoted the institutionalisation of the research results and sustainability. There is however evidence that participation in workshops by local outreach institutions has sometimes been less than satisfactory. LPP has done reasonably well because, by building increased collaboration with extension services and NGOs from project formulation to completion, research-extension links have been largely embedded into the target institutions.

LPP is also developing toolboxes of knowledge directed at target institutions like civil society (NGOs and CBOs) and extension agents. These toolboxes are searchable by problem phrase or word. To date, LPP has developed draft versions of toolboxes and knowledge banks for:

- Small stock keepers, in collaboration with the Animal Health Programme and DANIDA,
- DAP users, in partnership with KENDAT, University of Reading and University of Wolverhampton
- Dry season feeding options, in collaboration with the Matopos Research Station in Zimbabwe
- Farmer control of tsetse fly, in collaboration with ILRI, FAO and AHP
- Smallholder market-oriented dairying, in partnership with ILRI and FAO.

Experience in developing countries suggests that national extension systems are often reluctant to take up and disseminate pre-packed research outputs that they were not involved in generating and/or packaging, even though they can see the benefits of adoption by end-users. Therefore, if the outputs of research technologies generated by LPP are to have a good chance of being taken up and disseminated by the national extension systems, there may be need for them to be active participants in the packaging of the technologies.

Knowledge dissemination to developing country end-users

LPP has made good efforts in using products of its research to develop information packages for dissemination and up-scaling by the target institutions. It has produced information manuals, pamphlet, leaflets fliers, videos and radio programmes targeted at the smallholder farmers. The challenge is for target institutions to take over the information dissemination process to the end-users. However, the findings in Tables 3.1 and 3.2 suggest that LPP will need to carry out substantial work with the national livestock R&D institutions to promote further uptake and dissemination of the research outputs to end-users.

Knowledge dissemination to the international donor community

The problem of duplication of projects funded by different donors or institutions has been recognised by both LPP and livestock researchers supported by the Programme. The problem has been attributed to lack of communication and ignorance of what each agency or institution is doing, and because of varying interests of different donors. This duplication is considered to be getting less because of the new requirement by LPP for all project proposals to demonstrate stakeholder participation and for all commissioned projects to undertake annual stakeholder workshops.

To promote collaboration, information sharing, help minimise duplication and enhance coordinated livestock development in poor countries, LPP took the initiative to hold inter-agency meetings on livestock and animal health, bringing together donors, implementing and contracting agencies. The first inter-agency meeting was held in 2000 and inter-agency meetings have been held annually since. As a result of these meetings, LPP collaborates with several other agencies (e.g. FAO, IFAD, CGIAR institutions, CIRAD, IDRC, DANIDA) as well as RNRRS sister programmes (AHP, CPP, CPHP) in such activities as co-funding of projects, development of toolboxes of information, research and information dissemination. Knowledge sharing with the international donor community is therefore very strong. For more information see the Inter Agency website (funded by Pfizer) at <http://Iri.virtualcentre.org>

6.8 CONCLUSIONS AND LESSONS LEARNT

Table 5 provides an assessment of the LPP's performance based on the evaluation criteria and the finding discussed above.

Table 5. Performance evaluation ratings¹

#	Evaluation criterion	Rating	Remarks
1	Contribution to new knowledge	9	
2	Use of existing knowledge creatively in new contexts	9	
3	Programme innovativeness	7	
4	Programme risk taking	3	Little evidence of risky research
5	Awareness of current knowledge	7	
6	Achievements – the log frame	6	High achievement for outputs 1 and 2 in Table 3.1 and low achievement for outputs 3 and 4.
7	Science capacity building	7	
8	Building of long-term links between UK institutions and Southern institutions	3	Little evidence of deliberate strategies for long-term links
9	Knowledge dissemination		
9.1	• To science community	10	
9.2	• To developing country policy audiences	5	Performance here considered average
9.3	• To developing country outreach	6	
9.4	• To developing country end-users	7	
9.5	• To the international donor community	9	

¹Each criterion was scored on a 10-point scale, from 1 (little/worst) to 10 (much/best).

Lessons learnt

One key ingredient for the success of the LPP has been its flexibility. The Programme was able to adapt over time to emerging challenges while maintaining the programme goals. Consequently, the LPP activities improved over time. Thus the needs of the hitherto neglected landless livestock keepers were incorporated in to the programme in line with emerging policy issues from the programme and the realisation of the importance of livestock for these keeper groups. The LPP was able to gradually refocus its research activities towards poverty reduction following changes in the overall Strategy. With this chance, LPP research activities effectively shifted from largely station-based research to increased involvement of poor communities, thus making the research activities and outputs much more relevant. This process was also a learning experience of the researchers which should be valuable in the future.

The present LPP programme provides important lessons that should inform future research strategies:

- The need for livestock scientists in the South to take a leading role in project development and execution. This need, recognised by LPP, is important because it engenders ownership of the R&D process in the South and builds the capacity of the in-country scientists. Therefore, the current trend of more research projects being in-country led need to be promoted in the future.
- There has been very limited livestock policy research in developing countries in the past, partly due to the sensitivity of such research. Programmes like the LPP are probably the only ones well placed to address the politically sensitive issues of livestock policy for the landless livestock keepers and to effectively engage policy makers. Indications are that the LPP policy activities, though limited to date, were yielding positive results. Sustained research should help influence livestock policy positively in the future.
- LPP has been quite successful in technology development especially for the smallholder milk producers, crop-livestock farmers and small stock keepers where activities were carried out during the entire 10-year Strategy period. However, uptake and dissemination have lagged behind and seem to have taken a secondary role to technology generation, with the expectation that information dissemination will be the responsibility of national institutions. This position needs to be reviewed by LPP because technology uptake and dissemination are just as important as technology generation. Given the resource constraints of many national institutions in the South, LPP should in future focus much more on the technology dissemination and adoption activities through direct collaboration with national livestock extension systems than has been the case in the last 10 years. The ingredient of success in the achievement of programme goals, therefore, is for LPP to ensure that the technologies generated are disseminated and adopted. LPP should not leave this important aspect entirely to national institutions.

6.9 CONCLUSIONS

The evaluation shows that the LPP activities have improved and grown steadily over time, in terms of pro-poor focus and relevance of the science, capacity building, research collaboration with target institutions and international organisations, and strategies for knowledge dissemination and promotion. This indicates that knowledge gained over time has been invested for further improvements in the performance of the programme. However, this growth has not been even across livestock keeper groups or individual activities.

Relatively less technology has been generated for the landless livestock keeper groups which were included in the Strategy later. Although more intervention-related research will be needed to address the technology and policy needs of these groups, there is limited time left in the present Strategy to complete such research. However, it is felt by the LPP that as landless livestock keepers can be so marginalised, policy interventions are necessary to create an enabling environment before technology interventions can be successfully introduced and taken up. Secondly, technology generation needs to be followed by a successful process of dissemination, uptake by the extension systems and adoption by end-users. This process has not been completed yet and has somewhat fallen behind when assessed against the remaining time before the end of the Strategy. Thirdly, the potential problems of national extension systems not readily accepting to take up and disseminate pre-packed research outputs that they were not involved in generating and/or packaging has been highlighted. Therefore, if the outputs of the research generated by LPP are to have a good chance of being taken up and disseminated by the national extension systems, there may be need for these systems to be active participants in the packaging and dissemination of the technologies. It may therefore be necessary to extend the RNRRS or to start a new phase that will:

- Further promote uptake, dissemination and adoption of research outputs for a period of time long enough to ensure institutionalisation of the uptake to adoption process into the national livestock extension systems.
- Allow more research and policy analysis to be carried out on key remaining areas, particularly in respect of the pastoralists and landless livestock keepers.
- Encourage long-term relationships to be developed more deliberately than in the past between the UK institutions and the R&D institutions in the South.

The Core Team will need to verify these issues with the key stakeholders in the countries that they will be visiting

6.10 FUTURE RESEARCH THEMES

The research themes for the LPP are summarized in paragraph 55 of this report. Most of the research themes shown under the landless livestock keepers and pastoral were incorporated in the Programme after 2001. Substantial intervention-related research could not be carried out and completed before the end of the Strategy period under these two livestock keeper groups. The research themes for the development of pastoral communities and landless livestock keepers therefore need to be continued in any future RNRRS in order to narrow the current knowledge gaps.

During the 10 years of the Strategy, the LPP put substantial research effort on the themes under smallholder milk production, crop/livestock farming and small stock keeping. For the themes under the three livestock keeper groups, the process of technology dissemination and uptake by the national extension systems and adoption by end-users needs to be completed.

There is therefore a case for the continuation of the Programme focusing largely on intervention-related research for pastoral and landless livestock keepers, and technology dissemination, uptake and adoption in respect of the themes under the smallholder dairy, crop/livestock and small stock keepers. As stated in paragraph 55 of the LPP evaluation report, it will be necessary to extend the RNRRS or to start a new phase that will:

- Further promote uptake, dissemination and adoption of research outputs for a period of time long enough to ensure institutionalisation of the uptake to adoption process into the national livestock extension systems;
- Allow more research and policy analysis to be carried out on key remaining areas, particularly in respect of the pastoralists and landless livestock keepers; and
- Encourage long-term relationships to be developed more deliberately than in the past between the UK institutions and the R&D institutions in the South.

6.11 KEY RESOURCES

Key sources of information

1. The RNRRS document (Yellow Brick) and amendment documents
2. LPP Annual Reports
3. Individual project proposals and their log frames
4. Individual project reports for selected projects in Table 1.1
5. Project Completion Summary Sheets
6. Workshop reports and proceedings
7. Various leaflets, fliers and pamphlets
8. LPP website

Annex 1. DFID LIVESTOCK PRODUCTION PROGRAMME (LPP)

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	RISKS AND ASSUMPTIONS
<p>SUPER GOAL Poverty eliminated in poorer countries through sustainable development</p>	<p>Measures of empowerment</p>	<p>National and international poverty monitoring</p>	
<p>GOAL Livelihoods of poor people improved through sustainably enhanced production and productivity of RNR.</p>	<p>Food security indicators, measures of changes in capabilities; assets and activities; access to services</p>	<p>DFID-commissioned external reviews of DFID impact FAO and other agency datasets National and local level monitoring of poverty and livelihoods</p>	<p>Political stability maintained</p>
<p>PURPOSE Benefits for discreet groups of landed and landless livestock keepers generated by the application of new knowledge on the sustainable management of livestock in semi-arid, agro-pastoral, forest-agriculture, high potential and peri-urban production systems within an enabling environment.</p>	<p>By 2006, in response to primary demand from 5 discreet groups of resource-poor livestock keepers - smallholder milk producers, crop-livestock farmers, smallstock keepers, landless livestock keepers and pastoralists in Latin America, Sub-Saharan Africa and South Asia, evidence of one or more of:</p> <ol style="list-style-type: none"> 1) sustainable increase in production/productivity/survival of livestock of special relevance to them 2) more, cheaper, safer livestock products consumed and/or sold 3) increased contribution of livestock to crop production. 4) reduced drudgery, particularly in women/children. 5) improved employment opportunities. 6) stabilised balance between people and domestic livestock. 7) sustained environmental resource base. 	<p>National and local surveys of production, employment, food markets, nutrition. DFID evaluations. CGIAR reports. FAO reports.</p>	<p>Enabling environment (policies, institutions, markets, incentives), for widespread adoption of new strategies and practices. Poor people motivated to invest benefits to improve livelihoods. Climatic conditions are not atypical.</p>
<p>OUTPUTS 1. Strategies, technologies or policies which sustainably improve survival and/or productivity of livestock species of relevance to the livelihoods of poor livestock keepers, developed, validated and disseminated</p>	<p>By 2005, at least twelve technologies or strategies that meet identified needs of resource-poor livestock keepers developed and validated.</p>	<p>LPP Annual Reports Final Technical Reports Target Institution Reports Dissemination publications, extension leaflets etc</p>	<p>Enabling environment (economic, social and political stability) exists to facilitate adoption of new knowledge by end-users in target countries. Local research teams have adequate resources to conduct collaborative activities.</p>
<p>2. Baskets of new technologies, decision support strategies and policies developed to improve survival and productivity of livestock species kept by resource-poor livestock keepers, taken-up and promoted by target institutions.</p>	<p>By 2005 at least six baskets of information of relevance to poor livestock keepers, e.g. DAP, dairy rationing, dry-season interventions, nutrition/disease interactions, smallstock husbandry taken up by target institutions and promoted widely.</p>	<p>LPP Annual Reports Final Technical Reports Target Institution Reports Dissemination publications, extension leaflets etc</p>	<p>Local and national target institutions have adequate resources to take-up and promote research outputs</p>

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	RISKS AND ASSUMPTIONS
<p>3. New knowledge adapted and adopted and its impact on livelihoods assessed locally.</p>	<p>By 2006, evidence presented of adaptation and adoption of components of six baskets of knowledge Provisional evidence presented of the impact of adoption of new knowledge on livelihoods at the local level.</p>	<p>Independent in-country assessments</p>	<p>Enabling environment exists to facilitate adaptation and adoption of new knowledge by livestock keepers.</p>
<p>4. Approaches to scaling-up of strategies, technologies and policies which improve livelihoods of poor livestock keepers investigated and disseminated to appropriate target institutions.</p>	<p>By 2006, at least 4 new adopted knowledge baskets with positive impact on the livelihoods of the poor scaled-up at higher than district level.</p>	<p>Independent in-country assessments</p>	<p>Sufficient co-ordination with in-country and other institutions exists to fund the scaling-up process</p>