

Livestock and Livelihoods



Highlights from a sample of research projects commissioned on livestock of relevance to resource-poor livestock keepers in Africa, South Asia and Latin America

UK Department for International Development's
Livestock Production Programme



Front Cover Photo; Jean Noel Perrin
Young Indian boy with lamb in Peruvian altiplano

Dear Reader

This document contains a few Highlights from completed research projects commissioned by DFID's LPP over the past 5 years. In an effort to address the international community's Millennium Development Goals, the LPP has aimed its research on husbandry/technical interventions for livestock species kept by resource-poor farmers – sheep, goats and poultry in particular. It has also commissioned research on changing local and national policies related to livestock keeping in an effort to create a more enabling environment for the very poor livestock keepers in urban slums and in pastoralist societies. Finally, research on how information is most effectively transmitted to resource-poor farmers via a variety of intermediary institutions has also been supported recently and some of these results are highlighted in the following pages.

For more information on the activities of the LPP, you are welcome to write to us lpp@nrint.co.uk or look up our website www.lpp.uk.com

Best wishes,

A handwritten signature in blue ink, appearing to read "Wyn Richards", with a long horizontal flourish extending to the right.

Dr Wyn Richards
Manager, DFID's Livestock Production Programme
NRInternational,

Natural Resources International Ltd
Park House
Bradbourne Lane
Aylesford
Kent ME20 6SN
United Kingdom
T +44 (0) 1732 878686/7
F +44 (0) 1732 220498/9
info@nrint.co.uk
www.nrinternational.co.uk



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Goats, milk and empowerment

An alternative approach to decreasing plot sizes is to keep smaller milk producing stock, namely improved dairy goats. Thus, increasing numbers of farmers in several locations in East Africa now maintain various improved breeds (Toggenburg, Anglo-Nubian, Saanen etc) under zero-grazing conditions in preference to or as alternatives to dairy cattle. The advantages of keeping dairy goats have been well-documented by Peacock et al although the procedures for retaining hybrid vigour are not so well known and tested. In the Meru district of the Eastern Highlands of Kenya, LPP has commissioned the research component of a multi-donor initiative on the introduction of Toggenburg goats as a potential base breed for a sustainable pro-poor goat milk industry.

The project has been successful in the following ways: excellent planning and extensive training of local communities has resulted in a sustainable system



FI goat under zero-grazing housing conditions, Meru

whereby hybrid vigour is retained, clear responsibility of several layers of management at technical and geographic levels are understood and a community based organisation- the Meru Goat Breeders Association – is managing the whole process. Currently, more than 2100 families are rearing and milking improved dairy goats. The nutritional value and the income generated by the sale of the milk (average of 3.5litres/day) from the cross-bred goats (and sale of the goats as well) has significantly improved the livelihoods of their owners. Whereas this improvement has still to be assessed objectively, it is quite clear from the enthusiasm shown by the MGBA members and the commitment in following the guidances laid down that there is universal support for this



initiative and that it has contributed to the improvement of several capital assets. A high degree of empowerment has been engendered by the initiative, particularly among poor women; this is palpable by any visitor to the project area.

Whereas this project is due to terminate next FY, LPP will provide further research support on up-scaling procedures, on impact assessment and on further dissemination of the outputs of the project including the process and procedures employed by FARM Africa in executing the project.



Top & bottom: Toggenburg goats and their crosses proudly shown by their owners at a show near Embu, Kenya

Goat genes - an assessment of genetic diversity in Ethiopian goat populations

Small ruminants in Ethiopia, particularly goats, are major assets to small-holder farming communities. All the 18 million goats in the country are indigenous animals which over centuries of natural and human mediated selection have become adapted to the local environment. Whereas indigenous goats are hardy and well suited to the environment, their growth rate and fecundity are low compared with 'exotic' breeds and farmers are thus always striving to improve their productivity whilst maintaining levels of hardiness and tolerance to harsh environments. Increasing the productivity of local goats will directly benefit Ethiopian farming communities; goat herds are in most cases the responsibilities of children and women.

A prerequisite to any on-farm breeding improvement programme is an understanding of the diversity and inter-relationships of existing populations. Pioneering work done on physical description and management systems at Alemaya University of Agriculture together with FARM-Africa (DGDP-Dairy Goat Development Project) has showed the presence of 14 goat types in Ethiopia and Eritrea (Workneh, 1992; Alemayehu, 1993; Nigatu, 1994; FARM – Africa, 1996). However, to what extent these different goat types are genetically distinct at the molecular level has remained unknown until now.

The overall goal of this project is to understand the genetic composition of the indigenous goats of Ethiopia with the following specific targets:

- To quantify genetic diversity within and among Ethiopian goat breeds.
- To clarify the evolutionary genetic relationships among the Ethiopian goat breeds and more particularly to correlate goat morphological classification as indicated in the FARM- Africa 1996 report with molecular genetics indices
- To clarify the origin and history of Ethiopian goats through the study of non Ethiopian population of references

Thus far, the genetic diversity study of twenty goat populations (11 Ethiopian and 2 Kenyan, 1 Italian, 1 Saudi Arabian, 1 Guinea Bissau, 1 Botswana, 1 Mongolian, 1 Turkish and 1 Egyptian breed/population as reference breeds) has been completed. Analysis is ongoing and will be finalized by end of June 2004. Preliminary results indicate that the 11 Ethiopian populations can be grouped into nine distinct genetic



Central highland goat (Showa-Wello, Ethiopia)

entities for further genetic improvement and conservation purposes: Arsi-Bale, Gumez, Keffa, Long-Ear Somali, Woyto-Guji, Abergalle, Afar, Highland Goats (previously separated as Central and North West Highland) and the goats from the previously known Hararghe province (Hararghe Highland and Short-Eared Somali goats).

A major output of the work will be a set of recommendations to resource-poor farming communities and to the central and regional agricultural research organizations (e.g. Ethiopian Agricultural Research Organisation and Oromia Agricultural Research Institute), for the *in-situ* conservation and management, including genetic improvement, of indigenous Ethiopian goats. Efficiency of breeding improvement will be enhanced which will benefit the farming communities; the focus on upgrading indigenous breeds as opposed to cross-breeding using exotic blood is the uniqueness of this work.

Leaving out livestock – an unrecognised revolution in livestock keeping is taking place in many African cities

In a busy suburb of Kampala, just down from a thriving market, three cows stand on top of a rubbish heap which is spilling into the street. The cows browse amongst the waste. Similar scenes can be seen in Nairobi - a city struggling with slums knee-deep in rubbish. The cattle roam freely along with pigs, goats, sheep and chickens to scavenge whatever they can find and, at the end of the day, they make their way home. These animals may not always be well tended but for the poor they are a necessary part of urban life and a key contribution to their survival.

Refuse-ing to take notice

Peri-urban and urban livestock keeping is an essential livelihood activity for many, particularly vulnerable groups such as female-headed households, widows or the elderly, but it is not one that is recognized by city planners. In addition to providing milk and meat for sale or consumption, animals act as both insurance policies and banks for the poor. However, too often, livestock keepers are actually harassed or ignored by city officials since livestock keeping is largely illegal. And yet, a recent study* of five cities in Ethiopia, Kenya, Uganda and Tanzania has revealed that with increasing demand for land in cities for housing, urban livestock keeping appears to be favoured over crop production as it requires less or no land and provides better returns per unit area. Such a revolution in livestock keeping has also brought its problems, yet despite the environmental and public health concerns related to the problems of livestock waste, water availability and zoonoses that urgently need to be addressed, most city planners continue to disregard the existence of these livestock and the relevance of this livelihood activity to the urban poor.

The exact numbers of livestock kept in peri-urban/urban areas is unknown but numbers are high and increasing in parallel with the human population and the waste they produce is generated in substantial quantities. But do urban populations make the most of this waste or is the problem literally heaping up? From the study commissioned by the DFID Livestock Production Programme, waste management is found to be a major problem and disposal of waste is fairly arbitrary. Inevitably, waste mismanagement also means a problem of disease and living in such close proximity to animals always brings a risk of zoonoses, such as bovine tuberculosis, brucellosis and cysticercosis (see *Focus On Zoonoses in New Agriculturalist* <www>).



With a lack of education and limited access to information, symptoms of some zoonotic diseases continue to be confused with malaria and often remain undiagnosed and untreated.

Water availability is yet another critical issue facing urban authorities. Cities often struggle to provide sufficient water to the people and this is without taking into account increasing numbers of livestock. In many of the rapidly growing slum areas in East Africa, municipal water has to be bought so livestock only have access to other water sources, which are usually contaminated. The Nairobi Dam, for instance, is heavily polluted. Community competition over water is common and frequently leads to conflict.

No News is Bad News

As development initiatives have tended to focus on improved agricultural production in rural areas to supply expanding urban populations, information on peri-urban and urban livestock production has remained quite limited. However, the case studies from Dar-Es-Salaam, Kampala, Nairobi, Kisumu and Addis Ababa have revealed that livestock products produced in peri-urban and urban areas are a critically important source of food for people living in the vicinity, and that markets should be further developed. But quality control for products is often difficult to achieve, delivery of livestock services (particularly extension advice and disease control measures) is often non-existent and, where inputs are available, costs tend to be high. Poor livestock keepers rarely vaccinate their animals, particularly smaller species, and for larger

livestock, such as cattle, which are usually zero-grazed, feed quality and availability can be major constraints. For roaming animals, foraging at waste dumps is common and with little control over feed sources, nutrition is often poor and often hazardous. Consequently production is low and mortality from the consumption of physical and chemical waste products such as plastic bags and pesticides is high.

This DFID study has also revealed that not only are most of the poor uneducated, these livestock keepers are often marginalized from accessing knowledge and improved technologies. Very few poor livestock keepers belong to networks or organizations so demands are not expressed and crucial questions remain unanswered. Training, where it is available, tends to focus on dairy production or commercial poultry production and not on subsistence farming. Moreover, policy makers have yet to identify potential methods and mechanisms for enhancing livelihood security. Indeed, many current regulations are obsolete, often dating back to colonial times. Where new legislation has been introduced in more recent times, for instance livestock keepers in Dar-es-Salaam are limited to keeping four cows in particular zones in the city, there is general disregard or ignorance of the bye-laws. In Nairobi, five ministries appear to be partly responsible for urban livestock issues and there appears to be a general lack in policy coherence and co-ordination. Even where legal frameworks exist, the poor remain unaware of the regulations and they are rarely consulted in the modification or formulation of new policies; or at least until very recently.

From intolerance to inclusion

As cities continue to expand, so the number of poor involved in livestock activities will continue to increase but the negative impacts and resulting public costs will affect more than just the poor. And yet despite the obstacles to peri-urban and urban livestock keeping, there are significant benefits and other vulnerable groups not yet involved in this activity could also gain from livestock production. This vital sector can no longer be ignored, or remain illegal, and policy-makers will have to become more responsive and inclusive to the needs and interests of the urban poor.

Indeed, there are indications that this may be beginning to happen. For instance, Kampala City Council decided to review its 2001 Draft Ordinances in Urban Agriculture and Livestock using a consultative process involving urban farmers' representatives, technical officers, local leaders and

city and government planners and policy makers. As a consequence, amended versions of six ordinances related to urban agriculture/livestock issues have been approved by the Council so creating a much more enabling and legal environment for poor livestock keepers to operate in and to safeguard the welfare of people and livestock in general. There are also indications that such changes may also take place in other East African cities such as Kisumu and Nairobi. These developments are being facilitated through joint activities of the CGIAR Urban Harvest Programme and DFID's Livestock Production Programme.

*"Peri-urban and urban livestock keeping in East Africa - A coping strategy for the poor?" was funded by the DFID Livestock Production Programme. For more information about these activities, please look up the LPP website at www.lpp.uk.com.

For more information on this and other general development issues, log on to the latest edition of the 'New Agriculturist' at www.new-agri.co.uk.

Pastoralists in India

Pastoralism makes significant contribution to the economy of developing countries, both in terms of providing employment and income opportunities and in supplying nutrition to the rural poor, however, their economic system is constantly threatened by inappropriate Government policies. Indian pastoralism is under-researched and poorly documented. It differs in structure and social organisation from other parts of the world. Only a small proportion of pastoral groups have been described in detail - these include some of the larger communities in Western India, such as the *Rebari/Raika* and *Bharwad*, as well as some of the Himalayan region like *Gaddis*, *Gujjars* and *Kinnauras*. Population figures are scanty or non-existent, and some groups in the Deccan Plateau may never have been reported.



Gaddis migrating with their animals to Plains

Analysis of the available information on the pastoralists in the northern drylands and in the mountains reveals remarkable similarities in regards to the problems faced by them, despite the contrasting ecological zones that they represent.

There are no official pastoral development policies; in fact both the Ministry of Agriculture and the Ministry of Environment and Forests are remarkable in their stance against pastoralists. The livestock policies of the former have focused on cross-breeding of indigenous breeds with exotic ones while ignoring conservation and development of the much better adapted and often more productive indigenous breeds kept by pastoralists; animal health provision services have been geared towards the needs of affluent landed livestock owners; the considerable indigenous knowledge of pastoralists has not received any recognition and they are perceived as backward.



Gaddis with their sheep and goat flocks in Dhauladhar Ranges,

The Ministry of Environment and Forests is openly against pastoralists, attempting to exclude them from their traditional grazing areas.

There are a small number of NGOs and pastoral organizations; however, they have not yet been able to coordinate their voices and bring the subject of pastoralism to a national level.

Pastoralists have shown themselves to be very resilient, they have intact social structures and mechanisms for mutual sharing of resources, and their livestock also represent an encashable asset. Although the odds seem stacked against them, there is some hope that with increasing international emphasis on the conservation of biodiversity, pastoralists might be able to benefit from recognition for their role in conserving livestock genetic diversity, valuable indigenous breeds and indigenous knowledge about coping mechanisms to environmental stresses like droughts and floods.

The future of pastoralism in India will depend heavily on political decisions made by the State and Central Government. However, working with pastoralists, based on thorough understanding of their traditional production systems, indigenous knowledge, traditional strategies and practices, could empower the pastoralists and continue their capacity to produce food on marginal lands.



Husbandry strategies for improving the sustainable utilisation of forages to increase profitable milk production from cows and goats on smallholder farms in Tanzania

Project Purpose

To increase household income on crop/livestock smallholdings in Tanzania by developing farmer evaluation strategies for improving milking cow and goat productivity only through better use of indigenous forages

There is a large demand for liquid milk in Tanzania and current production is not meeting needs. Milk production from cows and goats on smallholdings gives a regular source of cash income for women and improved child nutrition. Ruminant animals which produce the milk contribute towards integrating crop and livestock production through use of crop residues as feed and nutrient cycling via excreta. Inadequate nutrition is the most serious problem which impedes livestock production in Sub-Saharan Africa (Tanzania included); given the introduction of high genetic merit breeds, improved nutrition could substantially raise milk production.



There was little evidence that the dairy production constraints facing poorer farmers in Tanzania had been adequately identified or addressed prior to this project. This project therefore applied participatory appraisal techniques so that farmers could identify and prioritise their constraints and evaluate experimental technologies. Farmer-to-farmer learning and evaluation permitted the transfer of potentially beneficial technology from one group of farmers to another.

The technology of manual box-baling of maize stover has shown that real economic benefits can be gained from simple applied technology. Allied with stripping the more digestible portions from maize stover prior to baling, the cost of transported forage was reduced

from 10 Tanzanian shillings per mega Joule of metabolisable energy to 4 Tanzanian shillings. This same technology can be applied to the roadside grass trade and provide benefits to both sellers and buyers of this forage.

Farmer-to-farmer visits and learning showed promise as a means of technology transfer and may have benefits over either training, extension approaches or local farm open days.

The project contributed to DFID's development goals by engaging in dialogue with poorer farmers, learning from their experiences and circumstances and allowing them to select and test technologies so that farmers become empowered to improve their own productive opportunities and hence alleviate poverty.

The adoption of a participatory approach to all stages of the technology generation and dissemination cycle is rare in livestock research and this project served as an example of the benefits which may accrue from this approach.

If only leaves are baled, then you can bale even more!

Leave the stems, as they make poor feed

BOX BALING

SAVES BIG MONEY!

University of Reading and University of Sokoine

Indicators of livelihood assets of livestock keepers

Fundamental questions to be faced in the development of indicators concern ‘what are they for?’ and ‘who are they for?’ The development of indicators involves consideration of (a) the livelihood contributions they are attempting to describe, (b) their content, and (c) the methods and techniques required for their application.

Different contexts and livelihood strategies require indicators which focus on different livelihood components. A helpful approach to considering ‘context’ may be to classify a community or area in terms of the natural resource potential and the market opportunities. Figure 1 presents this in terms of a low / high distinction on two axes, and then identifies (in each cell) possible livelihood development strategies that may be followed by poor livestock keepers in each set of conditions. For the poorer livestock keepers under any conditions, livestock are likely to be important in helping them to ‘hang on’, providing important buffering and insurance roles as they struggle to maintain precarious and vulnerable livelihoods at the margins of survival. In some situations they will also play important productive roles, generating subsistence and cash income. Beyond the minimal maintenance roles, livestock keeping may enable advancement through accumulation either of more productive animals (the ‘stepping up’ strategy) or of a set of assets that can be used as a base to ‘buy in’ to assets needed to gain entry to other livelihood activities (the ‘stepping out’ strategy). Thus livestock may be accumulated to fund investments in, for example, education (human capital), social and political contacts and advancement (social and political capital), physical capital (such as shops, vehicles and other items used for different businesses), or migration.

		Market opportunities	
		Low/Stagnant	High/Dynamic
Natural Resource potential	Low	<i>Hang on/Step out</i>	<i>Hang on/Step out</i>
	High	<i>Hang on/Step out</i>	<i>Hang on/Step out/Step up</i>

Figure 1. Context: Community / Area Characterisation and Livelihood Opportunities

Figure 2 then suggests possible roles of livestock assets associated with different livelihood strategies. Within a ‘hanging on’ strategy livestock may commonly play four important roles: providing for subsistence (through home consumption of meat, milk, eggs or fibre); supporting complementary (commonly cropping) activities (providing draft power or manure); allowing accumulation and disinvestments to buffer against seasonality in income in other activities (for example cropping activities or seasonal labour); and to allow some accumulation to meet irregular demands for cash. Within a livestock based ‘stepping up’ strategy, accumulation of productive animals is critical, whereas in a ‘stepping out’ strategy the productivity of the animals is less important than their ability to hold value as savings.

Livelihood strategy	Principle livestock roles
‘Hanging on’	Subsistence Complementary production Buffering Insurance
‘Stepping up’	Accumulation Complementary production Market production/income
‘Stepping out’	Accumulation

Figure 2. Principle roles of livestock by livelihood strategy

In each case livestock based strategies have to be evaluated against alternative means of ‘hanging on’, ‘stepping up’ and ‘stepping out’. For hanging on, unskilled labour markets and crop production may be the principle alternative means of subsistence, and social relations, informal financial markets and micro finance the principle alternative means of buffering and insurance. Most households will seek to spread risk and take advantage of niche opportunities by diversifying across these. For ‘stepping out’, alternative means of accumulation may again be investment in social relations, informal financial markets and micro finance institutions. For ‘stepping up’ there may be any number of alternative means of increasing income, ranging from cropping activities to a variety of non-farm activities.

The final set of more conceptual issues to be considered as regards the roles of livestock keeping in livelihood pathways concerns the often unique roles of livestock in conversion processes. These are set out in figure 3. The importance of these different conversion roles will again vary and interact with context (the natural resource potential and market conditions of figure 1) and with the livelihood strategy and livestock roles and species within it (figure 2). Thus we would expect the importance of some of these conversion roles to be greater for poor livestock keepers who are using their livestock to 'hang on'. Conversion of property rights and time are both likely to decline in importance in more productive systems, and hence to be of lower importance in 'stepping up strategies'. Conversion over space is an important component of extensive livestock systems, but of declining importance with more intensive systems.

	Conversion	
	From	To
Property rights	Common property	Private property
Space	Dispersed energy & nutrients	Livestock products (meat, milk, manure, eggs, fibres, draught power)
Time	Peak (seasonal) periods of high energy &	Periods of low energy & nutrient supply
Quality	Low quality resources (kitchen waste, crop residues, low quality)	High quality protein products
Value	Low value products (as above in terms of ownership, quality, space and time)	High value products

Figure 3. Livestock Conversion Roles

This discussion of the roles of livestock keeping in livelihood pathways takes further the 'asset function framework', the conceptual framework around which the project was originally devised. It has important implications for the development of indicators for livelihood contributions of livestock keeping, and indeed of other activities, as it suggests contexts in which (a) different attributes (discussed in the asset function framework) and (b) different alternative activities will be important. These then provide a basis for identifying and developing specific indicators.

In the context of low natural resource potential and low market opportunity it is unlikely that technological development which promotes increased production will have much livelihood impact as the 'hanging on' and 'stepping out' strategies are unlikely to be looking for greater productivity – and indeed without markets to dispose of incremental production, it will have very low value. Greater security, and more reliable (less risky) and faster accumulation are more important goals, achieved perhaps through disease control, or through more effective utilisation of scarce feed resources. Strategies adopted to achieve this should then take account of the major conversion roles played by different livestock species. In the context of high natural resource and market potential, on the other hand, increasing production may well be an appropriate strategy for those (often better off) households in a position to adopt a 'stepping up' strategy. This may involve less emphasis on temporal and property rights conversion, but greater emphasis on value conversion in terms of market (financial) values.



Sharing indigenous knowledge: for animal and human health

Although many different diseases can be treated using flora accessible from the immediate environment, modern science has historically considered the methods and practice of such traditional knowledge to be primitive and unreliable. Consequently indigenous knowledge has often been denigrated and even actively discouraged. The years spent ignoring traditional medicines have resulted in a situation where this **indigenous knowledge is in danger of dying out**. The younger generation simply does not value it as much as previous generations, all too often they prefer modern solutions. Since indigenous knowledge is the result of practical experience and observation handed down from generation to generation and its preservation depends on verbal instructions and practice passed down from parent to child, it takes only one disinterested generation to break the chain. Unless the younger generation is interested in and takes pride in this ancestral heritage the knowledge will not be preserved.

Preserving this knowledge is important because modern medicines and treatments are expensive and people in rural Kenya can rarely afford the cost of medicines they need to treat themselves and their animals. There is also increasing evidence of resistance to modern drugs, particularly antibiotics and anthelmintics. Moreover, these medicines, and the doctors and vets that prescribe them, are often located in distant towns/villages and they are simply not available when needed. Indigenous plant knowledge produces medicine that is both free and widely available near-by.

Additionally, while some documentation of indigenous knowledge does exist in Kenya, it is usually incomplete or confined to one particular area and often it is inaccurate. Moreover it often lies buried in folklore or in grey literature and papers and **the knowledge is inaccessible to the people who would benefit most from it** as well as the various support organizations that work with them. There is a need to produce this information in a way that is relevant and engaging to the local communities and can be shared between communities.

Hence it is the overall goal of this project to enhance the ability of communities in East Africa to improve their health and livelihoods by documenting, disseminating and sharing between



Kinna school girls looking at the comic produced by the project
Credit: A Powys.

regions in an accessible and engaging format, the existing indigenous knowledge of plants that can be used to cure/prevent disease in livestock and the community at large.

During the period September-December 2003, 'we undertook reconnoitring trip to the **Boran** people in Kinna near Meru National Park. The flora is typical of semi-arid lands of Northern Kenya. We met with Elders and Chief and enrolled them in the project. Provided traditional local leader gifts, and identified healers to work with.

- Interviewed healers--Trained healers and others in process of collection of data
- Identified important plants and their uses: diseases addressed and method of treatment
- Began the process of photographing plants, people, livestock and environment
- Visited schools in the area and discussed the project with the principal and students
- Discussed outputs with principals, teachers, elders, healers and chief and sought their opinion on how they can best use the material.
- Discussed dissemination of information with principals, teachers, elders, healers and chief.
- Made arrangements for the follow-up visit to record and photograph plants in depth.

Subsequently made reconnoitring trip to the **Mkogodo** people in the Mkogodo Forest in Laikipia. The flora is typical of dry cedar forests and undertook same series of interviews and activities and later completed both reconnoitring and final visits to:

- the **Boni** people on the Somali border. Hunter-gathers. Flora typical of low lying scrubland.
- the **Bajun** people in Kiunga on the Kenyan coast. Flora typical of coastal sandy terrain.
- the **Kamba** people in Machakos. Flora typical of deforested, terraced, agricultural land with intensively farmed smallholdings.

In December 2003, completed the compilation, editing and artwork for first comic book 'miti ni mali', for Kenya. and in January 2004 completed printing for Kenya.

In February 2004, disseminated comic books 'Miti ni mali' to Bajun and Boni People, the Kamba, Boran and the Mkogodo people. The communities with whom we had worked were delighted to receive a return so soon. We also returned with photographs of community members. We often heard the comment 'Many people have done research here before, but we never saw them again or any of their work'. The primary schools in the five community areas were given packets of books for Standard 7 only. A letter to the headmaster was included, requesting the children to do some local research themselves and send it to the project in the self addressed/stamped envelope. On receiving these replies, we promised to send a 'Miti ni Mali' poster.

Met with Assistant Minister for Education, Mr Laban Ayiro, and formulated communication strategy for possible dissemination of books

countrywide through the Department of Education. He showed great enthusiasm for the project and also gave us a letter of introduction to all schools in Kenya'

The project has begun scoping work in Uganda and Tanzania where it intends to engage with the Bagwere, the Ateso, the Banyankore, the Banyoro and the Batoro peoples.

Project team:

Leslie Duckworth,
Annie Powys,
Jane Newman

The 'Archers' comes to Tanzania

Tanzania remains one of the poorest countries in the world. The World Development Report ranks it seventh poorest with a gross national product per capita of US\$210 (1997 estimate). The poor are concentrated in rural areas, where 70% of the population lives. In a study carried out by the World Bank in 1997, poor access to information was cited as a key cause of poverty in rural Tanzania.

Entertaining and educative radio programming can play an important role in communicating information to relatively isolated and more remote audiences. Over 90% of households in both Kenya and Tanzania either own their own radio set or have access to a neighbour's or family member's. In a survey recently conducted in Tanzania, it was revealed that radio remains the most prevalent of all media-related activities. 97% have access to a radio in the home, compared to 56% having access to a newspaper and 21% watching television. It is clear that radio is the most effective medium in reaching wide, rural audiences in Tanzania, where many communities are remote and where they can be reached on the radio with programmes broadcast in Ki-Swahili - the national language.

During the period April 2003 – March 2004, Mediae launched a Ki-Swahili, pilot radio soap opera project in Tanzania. The area of focus was Arusha and Manyara regions, though programmes will be broadcast nation-wide in future. Project activities included:

- Qualitative research in May 2003 looking at rural audiences' radio listening habits and preferences, as well as their information needs.
- Quantitative baseline survey in August 2003, which looked at rural audiences' radio listening habits and existing knowledge, attitude and practice regarding certain livestock production and bean production issues.
- Recruitment of radio production team, for radio soap opera and a sister, magazine programme. Also recruitment of actors and script writers.
- Training of new recruits in the skills of radio soap opera production for educational purposes (development of characters, locations, long term storylines, synopses, script writing, acting, recording and editing).

- Recording of first three episodes of magazine and radio soap opera programmes, ready for pretest (to commence March, 2004) and writing of a further nine episodes, soon to be recorded.
- Negotiations currently underway for prim-time radio slots on RTD and Radio Free Africa.



Relevance to resource-poor livestock keepers

Integral to plot development within the radio drama series is information relating to prevention and cure of trypanosomosis, worm prevention and dry season feeding. Vital information, relevant to resource-poor livestock keepers throughout Tanzania has been gathered from scientists working at Sokoine University and LPP who have furnished this project with facts relating to these three subject areas. This information is being woven into exciting and realistic storylines within the soap opera, the first twelve episodes of which have now been written. Prime time transmission is currently being negotiated with RTD and Radio Free Africa which broadcast nation-wide and are the most listened to radio stations in rural Tanzania.

Project team:

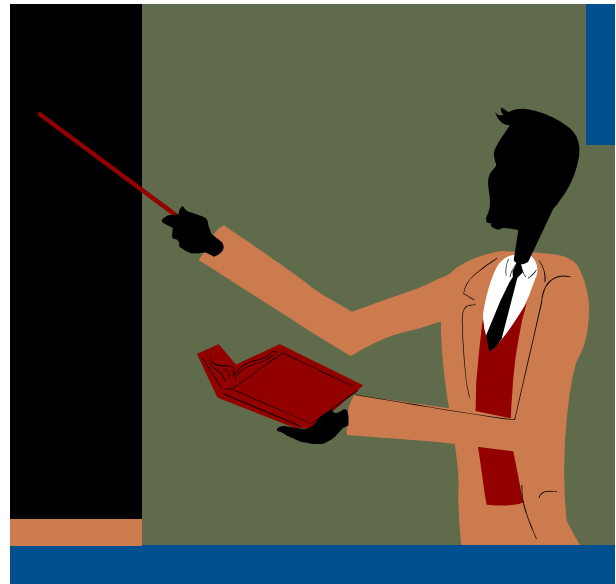
David Campbell,
Kate Lloyd Morgan,
Rose Kinoti

Livestock and Lectures: a new text book on improving the husbandry of livestock kept by resource-poor people in developing countries.

.....'We are all aware of the influence of the standard texts used in developing country universities and colleges on the thinking and knowledge of staff and students. You will also be aware of the widespread use of North American and European texts in universities and colleges in the south; despite their high quality, one must question the relevance of much of their content to developing country situations and particularly to resource poor farmers. This is not to question their scientific content since much of this is highly relevant. There are also some text books which have been written with developing country graduates in mind but very few have considered the needs of poor subsistence farmers and the conventional top-down structure has prevailed. I would like to think that we have an opportunity here to craft together a text book which will be both top-down and bottom-up and which will address the needs of resource poor farmers in the developing world viz. both the livestock and the farmers who keep them.'

With the above in mind, a number of planning/brain-storming meetings were held in the UK, in Africa and Latin America to discuss the feasibility and interest in this proposal. The products of these meetings generated greater insight and clarity on the book's purpose, structure, subject matter, chapter headings, obvious authors, time scales etc. as well as reality of what could be achieved with short time and budget horizons. These meetings also engendered common ownership of the textbook through the inclusion of a southern view on content and authorship.

The text book structure which follows was developed as a consequence of this broad consultation. The book is edited by a team of four, two from the UK (Prof Owen and Dr Smith) and two from the developing world (Dr Kitanyi from Kenya and Dr Jayasuriya from Sri Lanka). The text is divided into 3 Parts, the first putting the issues into a systems context, the second dealing with single livestock species owned by the resource-poor and the third attempts to put issues/livestock back into a systems (case study) context. Each of the 26 chapters (12 in Part 1, 13 in Part 2, and 1 in Part 3) has a mixed north-south team authorship comprising a lead author, a co-author or two and a consulting author. Where appropriate, chapters open with a short cameo indicating the relevance of the subsequent subject matter to the lives of the resource-poor. The cameos are meant to ensure that students see livestock as a component of a farming system which supports the livelihoods of



subsistence-plus farmers. Some of the chapter headings under part 1 include: why the poor keep livestock, livestock systems, livestock and the environment, livestock commodities and marketing, health, breeding, nutrition and feeding and knowledge empowerment . Part 2 deals with the husbandry of livestock kept by the poor: bees, snails/silk worms, poultry, small mammals, pigs, goats, sheep, camels and camelids, yak, buffalo, cattle, equines and wildlife. Finally, Part 3 deals with lessons learned and the way ahead through portraying a series of case studies.

The book is close to being submitted to the publishers; it is due to be published in the spring of 2005.

The above text is an abstract of the guidance given by W Richards to editors and authors of a new text book commissioned by LPP.

Development of practical livestock toolboxes

Throughout the developing world, farmers are failing to benefit from existing or new technologies due to a complex variety of reasons, however it is widely assumed that a significant livelihood constraint is the inadequate access to and exchange of information among marginalised farmers and livestock keepers.

A recent study has highlighted the fact that although poor farmers hear about general innovations they are



constrained by their inability to be heard and make their needs known and by unequal access to information¹. Effective communication mechanisms are necessary for researchers to link with farmers and extension agents to identify research problems, to adapt recommendations to local conditions and to provide feedback about the technologies adopted².

Communication theory suggests that we learn from a mix of methods.



¹Gundel, S., Hancock, J. and Anderson, S. (2001). Scaling-up strategies for research in natural resources management – A comparative review. Chatham, UK: Natural Resources Institute

²Agbamu, J.U. (2000). Agricultural research-extension linkage systems: An international perspective. AgREN Network Paper 106a. ODI, London

Therefore projects such as those funded under DFID NR research programmes need to present information in different, but complementary, formats. Where possible, farmers will act as the disseminators of information to their peers (e.g. in field days, on video, in radio programmes). The concept of **seeing is believing** is well understood.

Dissemination strategies must recognise the value of the formal extension services, and seek to support these, but also - with their agreement - to complement them with informal dissemination initiatives that utilise social networking channels that already exist.

Dissemination has two components:



- i. The **flow** of information to and between end users and key stakeholders and;
- ii. The facilitation and distribution of the **materials** required by farmers in order to adopt/adapt the technology.

Impact depends on both.

The dissemination of the **materials** needed for adoption tends to be neglected. This aspect will comprise two components within the project:

- (a) Support to the formal input supply system with information and technical support;
- (b) Mobilization of farmer-farmer multiplication and distribution of germplasm (crop/forage/livestock) and equipment (e.g. simple tools that can be fabricated locally).

Donors, managers and policy-makers will also be interested in the **process** followed by the project, the **lessons learned** and its **policy recommendations**.

The theory above concentrates at individual project level. Yet there are a myriad of difficulties which influence the application of the theory. Nevertheless, portfolios of projects i.e. DFID Research Programmes must capitalise on their inherent comparative advantage to enable the flow of information and facilitate the provision of the materials and skills required. One innovative option to enable the above is the creation of toolboxes.

Toolbox development

Toolbox development represents a more technical form of communication. Yet the concept is relatively easy in providing all the relevant information in one location, in a common format, that is easily extractable; this includes translation of information from one continent to another.



An LPP project leader 'communicating' with villagers in N. Tanzania, 2002.

The toolbox is a collection of related html (webpage) files, cross-referenced with each other. Development of a toolbox details existing knowledge i.e. the practical tools from a range of stakeholders – farmers, extension workers, aid agencies etc.

The target audience will be field extension staff and is intended to provide them with a 'basket of options' to offer farmers. This places a burden on field staff in

³By way of an example see the Livestock-Environment Toolbox – see link below: <http://www.lead.virtualcentre.org/en/dec/toolbox/homepage.htm> note this is a researcher/policy toolbox – the toolbox under discussion here will be much more practical.

⁴This includes formal and informal extension

the ability to articulate the needs of the farmer to match the options available in the toolbox. This is seen as a clear capacity building activity by providing ready access to up to date and relevant information.

There is clear demand for these toolboxes within the livestock sector and elsewhere. This concept has been discussed with research personnel, extension staff and farmers in several countries Bangladesh, Ethiopia, Kenya, Mexico, Nepal, Uganda and Zimbabwe. In the case of Uganda, considerable interest has also been shown by the CORD project and a toolbox is a planned component of a new project (R8281) associated with the NAADS initiative (CPP/LPP funding).

Where are we to date?

LPP is currently pioneering the development of three thematic toolboxes covering major areas of funding - draught animal power, smallholder dairying and, small stock keeping. Development will be in partnership with appropriate institutions namely KENDAT, ILRI and the Matopos Research Station, Zimbabwe respectively. It is important to observe that LPP is a relatively small programme and its projects do not form a critical mass upon which to construct a toolbox. However, when complemented with work from other organisations a critical mass can be obtained. To address this issue, other organisations (donors, CSOs, research institutes) working in these areas have been contacted and to date without exception, project information has been made available. Unfortunately many projects fail to generate the actual "tools" and the constraining step will be the extraction of these tools into practical messages; local groups are collaborating in this aspect.

Talking Pictures 2: analysis, management and decision support for farmers' feeding strategies

Agricultural knowledge and information flows in developing nations are, generally, not frequent or flexible enough to meet individual needs and to allow farmers to adapt effectively to short-term changes in resource availability and production levels. This holds particularly true for smallholder dairy systems in which changes in activities and resource availability on a daily basis can influence production and incomes in the short-term. The Talking Pictures - Dairy (TP-D) approach developed by a related project has used the scientific information on dairy nutrition packaged by the DRASTIC dairy rationing software (R 6282) as a basis for a new generic, pictorial dissemination methodology able to support dynamic decision-making. Uniquely, TP-D allows development professionals to provide their client farmers with a decision tool that can be carefully tailored to solving their own problems. This project is examining the potential for up-scaling the existing impacts of TP-D via the dairy co-operative union and NGO sectors in India.

At the time of writing, up-scaling activities have been proceeding for the past 9 months in four states of India - Gujarat, Rajasthan, Andhra Pradesh and Maharashtra. In spite of this relatively short timescale, a number of interesting and encouraging findings are emerging with strong indications of tangible impacts on the livelihoods of poor farmers:

Although, the pictorial decision tool necessarily operates with a greatly simplified model of dairy cow nutrition, it would appear that farmers and field staff are able to use it very effectively in modelling their own current practices and the outcomes of potential interventions. No prediction errors greater than 2 litres / day over the range 6 – 17 litres / day have been observed in the field. Indications are that the acceptability of such levels of accuracy is high amongst both extension staff and farmers.

In south Gujarat, pilot testing of TP-D in two villages by the Valsad District Dairy Cooperative (Vasudhara Dairy) proved very successful. Acceptability levels were high and the use of Talking Pictures prompted a number of management interventions by farmers. In particular, increased efficiency of supplement use in late lactation has resulted in considerable improvements in profit margins. Vasudhara have now expanded application of the approach to three more

3. Calf Rearing System



An example page from a Talking Pictures field guide used by farmers and extension workers. This guide has been easily custom-generated for the local situation using the Talking Pictures Software programme developed by the project

villages. Further expansion amongst Valsad's other 70 village cooperative unions is planned over the project's remaining nine months.

At the design stage it was envisaged that one of the most significant, and indeed unique, benefits of the Talking Pictures approach would be to offer farmers and extension staff flexible tools, customised for local situations, that they could use to analyse the impacts of different management decisions for themselves. As the up-scaling work progresses, it is increasingly evident that the project has been very successful in this respect. As an example of the way in which a generic tool such as Talking Pictures can be applied in ways that may not always be envisaged at the design stage, "change agents" in South Gujarat have been using the guides to provide indications of pre-clinical mastitis. For cows in which actual levels of milk production are substantially below those predicted by TP-D, these users have surmised that

this may indicate the presence of sub-clinical mastitis and used this as an initial screen for further sampling, testing and treatment.

Initial assessment of livelihood impacts indicates the use of the tool can have broad benefits that go well beyond simple productivity/production increases. Users, have indicated tangible benefits in *human capital* (improved decision making capacity in relation to feed management through both direct knowledge transfer and more effective use of existing knowledge), *financial capital* (enhanced income generation through regular and guaranteed milk sales; reduced financial risk as adaptability of TP-D allows farmers to formulate more robust strategies for their own circumstances), *natural capital* (more efficient resource use - less wastage as more informed feeding allows more effective forage / supplement combinations; healthier livestock through improved feeding) and *social capital* (strengthens extension - farmer linkages by increasing farmers' confidence levels; promotion of farmer – farmer exchanges).



As well as being an effective tool for individual decision making, Talking Pictures guides often provoke vigorous debate within groups of users, regarding alternative and most appropriate management strategies