

**Livestock Production Programme**  
**Semi-Arid Purpose 2 Production System**  
**Output to Purpose Review**

**A-H Uptake Pathway Trajectory**

R6097	Development of projects on livestock/wildlife interactions	Insufficient detail provided to make an informed decision. (summary sheet only)
R6300	Sustainable use of wildland resources: ecological, social and economic interactions	Objective to revise PM for further consideration by PAC. Grading not applicable
R6301	Optimising the utilisation of semi-arid rangelands	E
R6607	Privatisation of Rangeland Resources in Namibia	B
R6618	Conflict between farmers and herders in semi-arid Africa: an analysis of literature and experience	B
R6625	Livestock-wildlife interactions in areas of tsetse elimination and tsetse prevalence	Project not completed. Grading therefore not considered appropriate at this stage. However, indications are that a grading of F/G would apply
R6984	Environmental variability and productivity of semi-arid grazing systems	Project not completed. Grading therefore not considered appropriate at this stage. However, indications are that a grading of D/E/F would apply

- A Formal/Informal agreement with target institutions
- B Generation of relevant research results
- 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. development impact

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**Purpose:**

Benefits of poor people generated by the application new knowledge on sustainable management of livestock and wildlife in semi-arid rangelands.

**Outputs:**

The following outputs are taken from the 1998-99 annual report. However, all of the projects reviewed were originally targeted at RNRRS semi-arid production system outputs, rather than at these LPP outputs. Note that there are other projects, not reviewed here, that will also have results that are relevant to these outputs.

Output	Relevant projects
<p><b>2.1</b> Appropriate strategies for the allocation and management of common property resources in semi-arid areas identified, developed and promoted.</p> <p>2.1.1 Critical study of current property regimes and their appropriateness for sub-Saharan Africa and South Asia</p> <p>2.1.2 Evaluation of community wildlife management schemes</p> <p>2.1.3 Development of new initiatives in common property resource allocation and their management</p> <p>2.1.4 Study of the implications of policy changes including strengthening of common property rights and facilitating of spontaneous equitable privatisation</p>	<p>R6625, (R6300)</p> <p>R6607</p>
<p><b>2.2</b> Improved livestock management strategies to achieve stable balance between wildlife and livestock developed and promoted</p> <p>2.2.1 Study of the effects of current livestock management practices on wildlife population dynamics and biodiversity of the range resource</p> <p>2.2.2 Development of livestock management strategies to improve range utilisation by wildlife and domestic livestock</p> <p>2.2.3 Investigation of the impacts of livestock disease (including tsetse) control measures on wildlife populations and the development of improved strategies to minimise impacts</p> <p>2.2.4 Investigation of the impacts of economic policy on wildlife and domestic livestock mixes and exploitation patterns</p> <p>2.2.5 Study of encroachment of domestic livestock into protected game areas and interactions with wildlife</p>	<p>(R6300)</p> <p>R6301, R6984</p> <p>R6625</p> <p>(R6300)</p>

<b>2.3</b>	Relationship between productive capacity of rangelands and climate and other environmental variability identified and incorporated into management strategies	R6301, R6984, R6625
2.3.1	Testing of improved methods of monitoring rangeland, wildlife and domestic livestock populations, and drought prediction and the development of indices of range condition.	(Possibly R6984)
2.3.2	Study of impacts of range and livestock management practices on plant biodiversity and productivity, and the development of new low-cost methods of management	R6301, R6984
2.3.3	Development of drought management strategies for domestic livestock and the conservation of rangeland	(Possibly R6984)
2.3.4	Investigation of the interactive effects of biotic factors, weather and fire on the productivity and biodiversity of rangeland	
<b>2.4</b>	Interactions between farmers and herders at the interface between the pastoral systems and the crop-livestock system identified and management strategies for livestock production developed and promoted	R6607, R6618
2.4.1	Characterisation of interactions between herders and farmers at the pastoral system and crop-livestock system interface	
2.4.2	Investigation of the technical and socio-economic implications of increased crop cultivation on the grazing resource	
2.4.3	Study of the role and impacts of the use of crop residues and other farm derived feeds in the pastoral system	
2.4.4	Study of the effect of stratification of livestock production and improved marketing policies on the pastoral system	

## Relevant Projects and Outputs:

Project	Project Title	Targeted project goal / output as given by project memorandum	Relevant to Outputs
R6097	Development of projects on livestock/wildlife interactions	Insufficient detail provided to make an informed decision. (summary sheet only)	n/a
R6300	Sustainable use of wildland resources: ecological, social and economic interactions	Objective of project was to revise project memorandum for further consideration by PAC.	2.1.2 2.2.1 2.2.4
R6301	Optimising the utilisation of semi-arid rangelands	RNRRS semi-arid purpose: "Optimal strategies adopted for sustainable management of livestock on semi-arid rangeland".	2.2.2 2.3.1 2.3.2
R6607	Privatisation of Rangeland Resources in Namibia	RNRRS semi-arid purpose: "Optimal strategies adopted for sustainable management of livestock on semi-arid rangeland".	2.1.4 2.4.1
R6618	Conflict between farmers and herders in semi-arid Africa: an analysis of literature and experience	RNRRS semi-arid system purpose 1: "Interactions between farmers and herders at the interface between the pastoral and crop-livestock system identified and management strategies for livestock production developed and promoted".	2.4.1
R6625	Livestock-wildlife interactions in areas of tsetse elimination and tsetse prevalence	RNRRS semi-arid purpose: "Optimal strategies adopted for sustainable management of livestock on semi-arid rangeland".	2.1.2 2.2.3 2.3.1
R6984	Environmental variability and productivity of semi-arid grazing systems	RNRRS semi-arid system. "Relationships between productive capacity of rangelands and climatic and other environmental variability identified and incorporated into management strategies".	2.2.2 2.3.1 2.3.2

The projects reviewed were varied in their purpose and outputs, with little direct linkage between them.

R6618 examined the extent of conflict between farmers and herders, focusing largely on the situation in parts of the Sahel, and stands apart from the other projects reviewed here as being based on desk studies. The remaining projects were largely field-based. R6607, through an examination of fenced enclosure in northern Namibia, (together with R6618) also contributed to an understanding of the processes involved in the gradual evolution of pastoral land management systems.

R6301 and R6984 (not yet completed) examined the relationships between biotic, climatic and social factors on livestock productivity. R6984 builds on and extends the analysis of R6301. R6301 highlights the differences in productivity between livestock, with small-stock (goats) being shown to have significantly greater productivity than either cattle or a mixture of cattle and small-stock. This has important implications for livestock development programmes, in that a greater improvement in livelihoods is likely to be realised by focusing on small-stock than on cattle. These two projects, through application and testing of the models developed, can also be seen to offer the potential for future examination of questions raised by Output 2.4, as well as their primary objectives under Output 2.3.

R6625 examined the effects of disease control (through tsetse clearance) on subsequent land use practices. R6607 examined the history and impact of range enclosure by fencing. Whilst these two projects (R6625, R6607) are significantly different in both subject matter and methods, they examine changes in land management, and especially the impact on livestock, of policies that have far-reaching and often quite unforeseen consequences. The combined use of remote sensing, GIS techniques and participatory village surveys by R6625 covers parts of output 2.3.1 – the testing of improved methods of monitoring rangeland – These complimentary methods were applied to the examination of changes in land use over time. These changes could then be related to factors such as disease (tsetse) clearance and the presence/absence of infrastructure and services.

Project R6300 was again different to the others reviewed here in that the objective was to revise a project memorandum for further consideration by the PAC. In this case the output was the project memorandum itself – leading to the new project R7050 (ongoing). This project was targeted at wildlife-livestock-people interactions, and more specifically intends to identify the range and nature of factors involved in promoting unsustainable and illegal killing of wildlife inside protected areas for meat consumption by communities outside the protected areas. It is likely that this project will also have results that are applicable to the evaluation of community wildlife management schemes.

## Further Research

The findings from other research projects, not reviewed here, are likely to add to the outputs covered under LPP Semi-Arid 2. However, the projects reviewed here leave a number of gaps in the outputs covered. Property regimes and property rights are in general poorly covered. Much of output 2.4 is relatively new and needs research focused on these outputs.

Whilst there is a great deal of literature available on pastoralist systems, the majority of livestock in sub-Saharan Africa are maintained under different management systems, combining both crops and livestock. The property regimes and land tenure systems dominating mixed crop-livestock systems in semi-arid areas need to be examined in combination with other constraints to increased productivity. For example, what are the constraints to small-stock ownership in situations where an increase from less than 5 goats to more than 20 would result in decreased levels of poverty and in improved livelihoods. In particular, what current or future policies (e.g. land tenure policies, taxation and other financial policies, provision or lack of extension services and marketing infrastructure) are likely to have the greatest impact on improving livestock production, reducing levels of poverty and improving livelihoods? In addition to these questions, outputs 2.4.2 and 2.4.3 are relevant here.

There are linkages between Outputs 2.3.4. and 2.4.2. If these can be considered together by one or more projects, it is envisaged that the results would be widely applicable, especially at the policy level.

A review of the effectiveness of community wildlife management schemes in reducing poverty levels and contributing to enhanced livelihoods is needed (Output 2.1.2). There is an extensive body of background literature to call on (much of it likely to be biased and/or based on limited samples). However, important field-based participatory village and household survey work would need to be carried out in order to determine the effectiveness or otherwise of community wildlife management schemes under a range of different social, economic and resource/infrastructure scenarios.

The study of encroachment of domestic livestock into protected game areas and interactions with wildlife (output 2.2.5) is complicated by the essentially illegal nature of the encroachment itself. Studies of this nature have tended to focus on the disease transmission aspects of livestock-wildlife interactions. Whilst these are of importance, far greater importance should be given to an improved understanding of the underlying causes of these interactions themselves. For example, are the required resources (normally grazing but other factors such as security may also be relevant) not available to the livestock owners outside of the protected areas? If not, what are the constraints to improving the availability of the needed resources outside of the protected areas? If resources are limiting, what can be done to develop substitutes for the resources, or for the economic or livelihood benefits that their utilisation brings? For example,

would building a road result in opportunities for income diversification that reduced the need for utilisation of grazing resources inside protected areas.

Whilst a number of project touch on outputs 2.3.1 and 2.3.3, the core of these outputs – namely drought monitoring – has not been adequately covered. It is therefore suggested that the techniques that have been developed for drought monitoring through the use of satellite based methods be combined with the development of ground based indicators (that must be simple, cheap, rapid and applicable / available over large areas). Methods then need to be found whereby the results of these combined methods, utilising both climate research and livestock-related indicators, can be used at regional / national / sub-national levels by governments and NGOs in order to counteract or mitigate against the effects of drought. To be most effective, such programmes will either need to be long-term or will need to have access to established long-term data sets.

## Dissemination

Dissemination of outputs and results from these and other research projects in the LPP can be achieved through a range of methods. At one level the dissemination of results by individual projects in the form of journal articles, books and other published material will remain as an important means of distributing the research results. At another level, the programme is already commissioning a series of two-page summaries intended for more general readership.

It is suggested that these two methods should be complimented by the use of Internet / web based means of dissemination. An LPP web-site would be able to combine material from the two-page summaries with more technically oriented summary information and copies of individual research outputs, both published and unpublished material. In this way, some of the material that would otherwise never be disseminated by any other mechanism (*lost in the grey literature*) would be available to a wide audience via the Internet. Although developing countries are fast acquiring and using Internet technology, many users in these areas would not be able to fully access and benefit from this proposed web site, even with existing Internet access. Therefore it is also proposed that the same material be made available on CD-ROM format and mailed to interested parties. A single CD-ROM would be able to hold the entire output from LPP (and from other related research programmes as well) with many project outputs available in Adobe Acrobat (.PDF) format.

Dissemination through workshops focused on specific geographic regions and/or topics is also a valuable means of obtaining feedback and contributions from developing country partners. During these workshops the above web-site and CD-ROM can be promoted and the most up-to-date version distributed to participants.

Publication of a journal / newsletter is also a widely recognised means of dissemination and a title such as “*Livestock Review*” can be considered as a means of highlighting issues. This can be made available both in published “paper” format as well as on the Internet (part of the above proposed web-site and CD-ROM). A major focal point for this proposed publication would be the contribution of papers / articles by developing country partners.