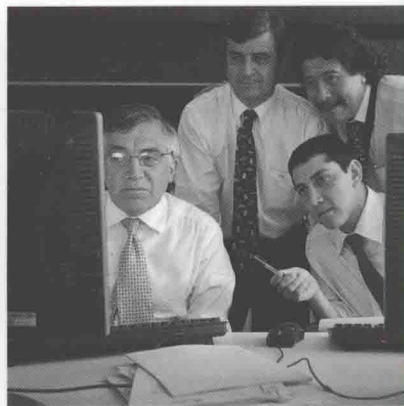


FAO ANIMAL PRODUCTION AND HEALTH



guidelines

GUIDELINES FOR THE
PREPARATION OF
LIVESTOCK SECTOR REVIEWS



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LIVESTOCK SECTOR REVIEWS



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Recommended citation

FAO. 2011. *Guidelines for the preparation of livestock sector reviews.* Animal Production and Health Guidelines. No. 5. Rome.

Acknowledgement

Particular thanks are due to Anni McLeod for her help and advice throughout the drafting process. Useful suggestions were also provided by Simon Mack and other members of the Animal Production and Health Division of the FAO. Advice was kindly given by Cornelis De Haan and Jimmy Smith of the World Bank while field-related information was provided by officers of the Animal Production and Health Division and by Clare Narrod and Derek Baker of International Livestock Research Institute. Thanks are due to Bruce Cottrill of ADAS UK Ltd. who contributed the Annex on livestock feed balances, originally drafted by Roger Lough. Inputs to this Annex were also provided by Harinder Makkar and these are gratefully received. Thanks are also due to the FAO officers who reviewed drafts of the document. Claudia Ciarlantini and Carmen Hopmans together with Carol Johnston carefully edited and polished the presentation of these guidelines and their assistance is appreciated.

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ISBN 978-92-5-106910-3

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Glossary

Asset specificity: Assets are items of value possessed by an agent in a market transaction. If the assets, of one or both the agents in the transaction, are specific to a particular industrial sub-sector, there is an incentive to ensure secure contracts for future transactions. This might be the case for specialist dairy farmers and the milk processors with whom they trade. The assets, cows and pasteurising equipment, might prove valueless if the trade should fail.

Coding: Use of a system of numbers, or other symbols, to represent and replace categories of textual descriptive data, in order to facilitate recording and quantitative analysis.

Collateral: Property pledged by a borrower to provide security to, and protect interests of, the lender.

Competitiveness: The extent of market competition between participants in the market.

Contract: A binding agreement between two or more parties, that may be informal 'a gentleman's agreement' or legally enforceable.

Equity: Justice according to natural law or right: fairness. Alternatively it may be used to describe the value of capital assets owned net of borrowing.

Excludability: A beneficial good or service, access to which may be denied for some individuals or groups in society.

Fitness traits: Characteristics of animals, of interest to humans, associated with viability, adaptation to the local environment and reproduction.

Focus group: A number of people (stakeholders) gathered together to discuss information relating to specific issues and participant attitudes, so that others may benefit from their opinions and assessments.

Food security: Food security, at the individual, household, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and *nutritious* food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996). At the national level, physical access depends upon production, imports or food aid. Economic access refers to purchasing power, depending upon adequacy of incomes and the relative levels of food prices.

Free riding: A situation where independent, rational individuals can ride free, relying on the generosity or abstinence of others, for instance in grazing their cattle on common land, using public water supplies or depending on the sanitary measures taken by other livestock keepers.

Governance: The institutional and organizational framework within which transactions are conducted.

Gross margin: The gross margin of an enterprise is equal to its gross output less its variable costs. Gross output includes the market value of produce retained by the

farm household. The variable costs must a) be specific to the enterprise and b) vary in proportion to the size of the enterprise (e.g. per head of livestock).

Gross output: (Also referred to as gross income). The value of the product output of a farm enterprise, over an accounting period (usually a year) whether the produce is sold or not. For livestock the output is net of the value of any animals purchased or obtained as gifts. The value must be adjusted for changes in inventory valuations, for instance the depreciation of breeding livestock, or appreciation of growing stock.

Herd growth model: A mathematical equation system in which the herd structure is described by the numbers of animals in each age and sex cohort. Annual transition probabilities, for the birth-rate, transfers between cohorts, mortalities and off-take rates, are applied to determine the change in herd structure and numbers each year and hence the growth of the herd over time.

Institutions: These make up the set of political, social and legal 'ground rules' that govern social relationships. Formal institutions include laws and policies regulating behaviour at local, national, and international levels. Informal institutions include social customs and conventions that may be deeply embedded in a person's culture.

Insurance: A contract whereby one party undertakes to indemnify another against loss by a particular contingency or risk, in exchange for regular payment of an annual premium.

Investment: Investment is an addition to the stock of capital. The cost or effort involved in making an investment represents a saving, or current consumption foregone. The usual aim of investment is to increase future production and income by more, in total, than the original investment cost. The surplus, over and above the cost of the investment, is known as the 'return on capital'.

Livelihood: The means, usually productive employment, by which persons or households support themselves.

Livestock Units: Livestock units, used for aggregating the numbers of different categories of livestock, are usually derived in terms of relative feed requirements. Conversion ratios are generally based on metabolisable energy requirements, with one unit being considered as the needs for maintenance and production of a typical dairy cow and calf.

Market chain: A series of linked intermediary traders between the producer, of livestock or other commodities, and the final consumer. The series is also linked back 'upstream' from the producer to the input suppliers. Branching may occur at any stage of the chain.

Micro-finance: This term refers to the large-scale provision of small loans to low-income people, an established example being the Grameen Bank in Bangladesh. A more commercially oriented micro-finance approach has since been developed, still focused on the poor but with more emphasis on the provision of savings services as well as loans. A key innovation of micro-finance is the use of joint group liability, such that if one member of the group defaults the entire loan is considered to be in default.

Model: A simplified, usually mathematical, representation of reality, designed to reflect those features of a farm household, market chain or other system that are of most importance in the context of a particular study.

Moral hazard: This is a form of ex-post opportunism, meaning the incomplete or distorted disclosure of information as it affects behaviour, after a contract has been agreed. It arises because of 'information asymmetry' between two contractors, the 'principal' and the 'agent'. Examples may be the livestock insurance provider and the policyholder or the employer and the hired worker. In either case the 'agent', with the security of a contract, and without careful supervision by the 'principal' may become careless in the health care of their animals or the standards of their work.

Off-take: The number, live-weight or value of animals removed from a herd/flock, per year, for home consumption, sale or as a gift to another person. Together with animal mortalities due to disease or old age, they account for the total annual exits from the herd/flock.

Opportunity cost: The cost of any choice measured by the value of the most rewarding alternative foregone.

Organization: An administrative and functional association or society, such as a business firm, a club, a village, or a co-operative. The membership rules and procedures are part of the institutional environment for the members.

Production: The quantity or value of the commodities produced.

Production traits: Characteristics of animals, of interest to humans, associated with the products derived from animals, and therefore with rates of production, such as milk yield or live-weight gain.

Public good: A pure public good is both non-exclusive and non-rival. Hence free-riding is possible and private investors are unlikely to be able to charge for its use. It follows that public sector intervention is likely to be needed for its provision, if this is shown to be justified.

Rivalry: Rivalry in benefiting from the consumption of a good, implies that consumption by one person prevents anyone else from consuming it, as would be the case with a cup of milk. In contrast a non-rival good, such as a zone from which an infectious livestock disease has been eradicated, benefits many owners at the same time.

Risk: Risk is a measure of the effect of uncertainty on the decision-maker. There are differences of opinion as to how risk should be measured. Some argue that it is the variation or instability of outcomes (pay-offs) while others claim that it is the possibility of disaster or ruin. In both cases risk depends upon the value of the outcome and the probability of its occurrence. Most decision-makers seek to limit their exposure to risk. They are 'risk averse'.

Scoping: Project scoping is a brief analysis and review of what the project will involve, what the risks and possible difficulties are, and how the work should be organized and implemented.

Stakeholders: A stakeholder is a person, or an organization, that has a particular interest in a private, public or non-governmental sector policy, programme or project. The interest may derive from being a potential beneficiary, an ordinary member of the community likely to be affected, an organizer, administrator or facilitator, a donor, the Government, a

Non Government Organization, a Community Based Organization or a researcher. Anyone may choose to be a stakeholder, but resource limitations require that judgements must be made on the relative importance of different individuals and organizations.

Stocking rate: This is measured by the population density, of ruminant livestock, per hectare of agricultural land. The livestock population may be given in (Grazing) Livestock Units, to allow for differences in feed requirements between bovine animals and small ruminants. Livestock population density may then be related to total agricultural area or, for pastoral systems, to the area of rangeland grazing.

Transaction costs: These are the costs of exchanging goods and services, which can arise in three broad areas; a) gaining information on potential buyers or sellers, b) negotiating contracts and c) monitoring and enforcing the implementation of the agreement. Their level is influenced by the choice of market institutions.

Value added: For a particular industry, such as agriculture, value added is equal to the value of its output minus the value of intermediate inputs it buys from other industries. Value-added, in turn, is equal to the payments to the factors of production (land, labour and capital) employed in the industry.

Value chain: A set of generally applicable, interrelated activities, common to a wide range of productive enterprises. A value chain can be defined for a company or an industry. The concept gained wide acceptance after it was described by Porter (1985), who differentiated between the primary activities needed to produce and market a product and the supporting services. The goal of these activities is to create value added. Any or all of them may be vital in developing a competitive advantage.

Vertical integration: The process by which several steps in the **production** and/or **distribution** of a **product** or **service** are controlled by a **single company** or **entity**. The main aim is to reduce transaction costs by incorporating input suppliers, backward integration, or by joining with major retail outlets, forward integration.

Preface

Demand for livestock products has grown rapidly in recent decades in response to increases in human populations, particularly urban dwellers, and in their incomes. This 'livestock revolution' has generated steadily increasing levels of livestock production, making this sub-sector one of the fastest-growing in agriculture. Furthermore there is increasing recognition that livestock provide a vital contribution to livelihoods, income and nutrition of the rural poor.

However, most of the developments in livestock production and marketing have resulted from private investment, frequently in high-density large-scale commercial systems. With little or no public sector regulation these developments may force competing small producers out of the market. In addition the increase of animal population densities associated with growing livestock production has been linked with environmental problems of land degradation, soil, water and air pollution, and reduction in biodiversity, together with increased risk to human health resulting from animal diseases.

For these reasons, and the relative neglect of livestock development in past national decision making, there is now an urgent need for increased public sector investment, institution building and regulation of the livestock sub-sector (FAO 2009, World Bank 2009). National or regional policies require careful planning and design, for which a key first stage is the preparation of a Livestock Sector Review (LSR). Forms of LSR are also needed to support requests for donor funding of specific projects, or to plan effective policy responses to climatic, disease or conflict-related emergencies. Many such reviews have been conducted but there are inconsistencies in their purposes, scales, contents, levels of detail and support for policy recommendations. Generally applicable guidelines for the gathering of relevant information and preparation of livestock sector reviews have been lacking. The intention of the present exercise is not to impose prescriptive rules but rather to provide indications of tried and tested approaches, analytical tools, contents, and delivery methods for the presentation of livestock sector reviews.

Positioning

These guidelines share some features in common with the Livestock Sector Investment Planning Tool (LSIPT), which is being developed by FAO, the World Bank, CIRAD (Centre de coopération internationale en recherche agronomique pour le développement) and governments in sub-Saharan Africa, under the ALIVE Partnership for Livestock Development, Poverty Alleviation and Sustainable Growth (PPLPI 2006). The aims of the LSIPT are more specific than those of the present guidelines, in being designed for use in sub-Saharan Africa, yet more ambitious in 'establishing coalitions for change' and 'to reposition the African livestock sector in development agendas'. While there is complementarity in content between the two, the aims of these guidelines are to provide an aide-memoir or checklist rather than a detailed toolkit, and they are intended for use in any part of the developing world and not only in response to requests for livestock sector reviews for inclusion in Poverty Reduction Strategy Papers.

Other decision support tools for livestock policy planning have been developed within the Livestock Information, Sector Analysis and Policy Branch (AGAL) of FAO's Animal Production and Health Division. The Livestock Environment and Development (LEAD) group can provide the following tools: livestock and environment toolbox, participatory land use planning, the livestock development planning system (LDPS²), manure management options for confined pig production in rapidly growing economies, nutrient balance model, fossil fuel in livestock systems and global livestock densities, the last using Geographical Information Systems (GIS) technology. The Pro-Poor Livestock Policy Initiative (PPLPI) also has the following decision-support tools: Ex-ante tool for ranking policy alternatives (EXTRAPOLATE), Integrated poverty assessment for livestock promotion (IPALP) and the technology impact and policy impact calculation model (TIPI-CAL v 4.0). Also of value are mapping systems and atlases such as GLIPHA (Global Livestock Production and Health Atlas) and GLIMS (Global Livestock Impact Mapping System). None of these tools alone provides the basis for a livestock sector review. Nevertheless, several of them can provide for deeper analysis of some elements of the review.

Target audience and content

This set of general guidelines for the preparation of Livestock Sector Reviews is intended to assist livestock policy advisers in FAO or other organizations in this activity. The intended audience includes:

- Recruiting officers responsible for drafting Terms of Reference for reviews;
- FAO consultants who would appreciate a checklist;
- Young professionals;
- Other livestock or social science professionals who have not previously conducted a sector review.

The document consists of five main chapters.

1. The purpose of livestock sector reviews: reconciling different social objectives, review requirements and resource constraints
2. Core content of the review: key components and recommendations
3. Analysis of specific issues: specialist topics not included in all reviews
4. Conclusions: future investment and policy options and action plans
5. Data, information and analytical tools: covering data recovery and methods of analysis

The recommended sequence of activities, contents of the review and data sources represent comprehensive standards to be aimed for. In practice, many review studies are concerned only with a particular livestock enterprise, such as poultry production, or a particular institutional or technical innovation. Results are often required urgently so planning is subject to time constraints. A less extensive review is then justified and appropriate. More generally, clients for livestock sector reviews and team members are faced with paucity of reliable data, in addition to financial and human resource limitations. Expert judgement is needed, by both clients and review team members, in balancing review requirements and recommended review standards, against resource limitations, in the preparation of livestock sector reviews.

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Chapter 1

The purpose of Livestock Sector Reviews

POTENTIAL AIMS OF THE REVIEW AND POTENTIAL CLIENTS

The request for a livestock sector review generally stems from a policy maker's recognition that information and guidance are needed for livestock sector planning. For instance, the review may be needed for:

- developing a national (or regional) livestock development strategy
- promoting incorporation of livestock in a Poverty Reduction Strategy Paper (possibly complementing use of the Alive toolkit in African countries)
- requesting donor funding for a livestock project
- providing background information for planning emergency response, or
- contributing to a thematic review of a wider development-policy issue.

The development of a national livestock strategy, with or without particular emphasis on poverty relief, may well include all livestock species and production systems. Note also that livestock cannot be viewed in isolation. Most livestock production systems are incorporated in mixed crop-livestock systems while, through input and product market chains and domestic resource allocation, the livestock sector is linked with the whole national economy. However, in some cases the review may be focussed on particular sub-sectors of the livestock industry, such as the dairy or the poultry sub-sectors.

Where the aims are more specific, as in requesting donor support for a particular project, or for planning emergency response, the review is more likely to be directed to a particular type of livestock production system. A livestock sector review intended only as a contribution to a wider thematic policy review, will be focused more narrowly on the relevant aspects of the livestock sector.

The clientele for such sector review studies normally consists of the government agents engaged in national development planning. However, professional and financial assistance may be provided by international support agencies, international non-government organizations (NGOs) and national NGOs. These other organizations, in providing support, also become clients for, or sponsors of, a review report even though planning strategies are the responsibility of national government agents.

The basic purpose of a livestock sector review is to describe and analyse the structure, conduct and performance of the livestock sector and its associated programmes and policies. However, this analysis should be motivated by the aim of identifying the strengths and weaknesses of the sector and the associated programmes and policies. Together with assessment of the prospective threats and opportunities, the findings should indicate

promising future investment options. This does not require detailed project appraisal at the review stage, but does provide for the essential scoping of recommended investment options.

ROLE OF THE PUBLIC SECTOR

For several reasons, the unfettered private market development of the livestock sector is unlikely to make adequate provision for selected social and environmental goods and services. One reason is the need for 'public goods,' such as the provision of roads, law and order, border quarantine or food-safety inspection, from which anyone can benefit without paying¹, so there is no incentive for private provision. Policies for the prevention of epizootic animal diseases fall under this heading.

Poverty relief is an important social goal that may require public sector intervention, for instance where the benefits of economic growth are not spread equitably. Provision for this objective may be categorised as a 'merit good'. Its importance is agreed internationally in the Millennium Development Goals and promoted in Poverty Reduction Strategy Papers.

Another area of 'market failure' results from 'externalities', which are costs or benefits borne by others who are not party to a business transaction. Thus a livestock producer who adopts bio-secure practices provides external benefits to the neighbouring producers in terms of reduced animal disease risk. Environmental impacts of livestock keeping, such as land degradation, soil, water and air pollution and loss of animal biodiversity, are seen as external costs of intensive livestock production.

Market imperfections may arise, such as through the emergence of large scale monopolistic traders, with power to adjust prices to their own advantage. Poor communication facilities and limited access to information may result in information asymmetries, between livestock producers and market traders, or between input suppliers and livestock keepers. Exploitation of these variations in market power provides opportunities for inequitable inflation of marketing margins.

Public sector intervention is needed for all these reasons, and to provide for the co-ordination of input supplies, such as that of veterinary services and market facilities, with the distribution of producers. Intervention may involve capital investment in infrastructure, and expenditures on grants or subsidies. However, much can be achieved by development of improved institutions and by regulation. All these approaches require funding from the public budget or from donor aid. Hence any livestock sector strategy or programme is also an item of public expenditure. A livestock sector review should therefore also serve as an exercise in Agricultural Public Expenditure Analysis (World Bank and Dfid 2010).

NATIONAL DEVELOPMENT GOALS

The aims or 'target values' of the strategies, or programmes, being reviewed, are supposed to contribute to the achievement of higher, national level, social welfare objectives. Apart from the two key objectives of 'economic efficiency' and 'distributional equity' there are others which are of public concern. These are discussed in more detail below. Most govern-

¹ This is the non-excludability (anyone can benefit) characteristic, which allows 'free riding'. The other characteristic of non-rivalry means that use by one member of the public does not detract from use by others.

ments claim to devote some attention to them all, but the relative importance given to each one is likely to vary from country to country.

Economic efficiency. This implies making the most productive use of national resources. A crude, but useful, measure is provided by the level of national income (Gross Domestic Product) per capita. Annual growth in average per capita income is used as an indicator of an increase in economic efficiency and successful development policies. Given this objective, all livestock development strategies and programmes, as items of public expenditure, should be carefully managed and controlled. Budgetary over-spend should be avoided and, ideally, strategies and programmes should be aimed at yielding a competitive economic rate of return.

Food security. Within the developing world rapid growth in demand for livestock products, widely described as the 'livestock revolution' has been met by substantial increases in livestock production. Concerns arise as to whether these high rates of growth in livestock production are sustainable. With regard to food security however, there are two important considerations. One is that although on average globally, livestock products contribute 15 percent of total food energy and 25 percent of dietary protein supply as well as essential micronutrients, they are not considered as part of the basic staple diet of the poor or of emergency food aid. Secondly, food security does not require that a country is self sufficient in a particular product. In fact, the least developed countries are generally net importers of food, including livestock products. None the less, governments of these countries are likely to be concerned that the shortfall in domestic livestock production does not widen and create the need for increased imports and a weakening of the balance of payments.

Poverty relief. The key goal of improving the livelihoods of the poor can be achieved as a result of national income growth. Increases in livestock production may lead to income and welfare improvements for both rich and poor producers. However, some technological and institutional changes, designed to improve livestock production in general, may disadvantage small-scale producers and generate inequalities. Hence livestock sector policies that are aimed primarily at poverty relief may differ from policies aimed more specifically at economic growth.

Natural resource and environmental protection. Livestock production has significant impacts on the environment. Feed crop production is often associated with land degradation and water pollution. Atmospheric pollution is also important, while inbreeding for yield improvement lessens the extent of biodiversity. Given the global concerns over protection of the environment and amelioration of global warming, these issues should be borne in mind when planning livestock development policy. However, in low-income developing countries this objective is unlikely to be considered as important as economic growth and poverty relief.

Protection of human health and food safety. Another key objective of livestock development strategies and programmes is that livestock products should be safe to eat. In recent years, new animal diseases have emerged, such as highly pathogenic avian influenza (HPAI) and bovine spongiform encephalopathy (BSE), from which the fears of human infection have caused major disruption to livestock production and trade. All governments must be aware of the dangers of a global pandemic from a livestock borne disease, but in

low-income developing countries the need for investment in disease prevention and control is likely to have lower priority than the desire for income growth and poverty relief.

RECONCILING CONFLICTING OBJECTIVES

Governments and societies must find a balance between different objectives, but the chosen balance of objectives will differ from country to country, depending on the level of development and the role of livestock in the economy. For some low income countries, economic growth may be the first priority, for others poverty relief and livelihoods will take precedence. Food security may also have a high weighting. In wealthier middle and high income countries, human health concerns and the environment will be paramount.

There are challenges in balancing multiple objectives. A practical approach may be based on judgements of the national relative weightings, or rankings of the set of objectives. The primary strategic objective for livestock policy is then to strive for the highest ranked of the set, while avoiding restraints on other objectives. For instance if the primary objective is economic growth, the sector strategy should also be designed to avoid any adverse impacts on the livelihoods of the poor, food security, the natural environment, and human health risks. Practically all the alternative objectives listed in the previous section are associated with risk and uncertainty. Economic growth is subject to global market and price uncertainties and undesirable fluctuations. Food security and poverty relief may require periodical emergency support. Disease incidence is hard to predict. Production from livestock is affected by natural resource disasters. Hence a further development objective may be added to the above list, namely '**resilience**' meaning the ability to adapt and adjust to external environmental social and economic shocks and thereby limit damaging fluctuations.

SCOPE, SCALE, TIMING AND COSTS OF REVIEWS

The scope, scale and cost of a livestock sector review must be influenced by the size of the country or region under review. For example a comprehensive livestock sector review study for India (World Bank 1999) is necessarily a larger scale exercise than one for the Lao PDR (Stür *et al.*, 2002). However, for any given country or region reviews may range in scope from a broad general review of the whole livestock sector to one concerned only with one particular livestock species or even a specific livestock production system.

Mention has already been made of Livestock Sector Reviews required as contributions to thematic surveys of wider development-policy issues. Examples might include environmental studies such as the sources of greenhouse gas emissions or carbon recycling, international trade policy, disaster risk management or gender roles, rights and responsibilities. The livestock component of such studies is likely to be narrower and more tightly defined than for reviews specifically focussed on the livestock sector.

Indications of the potential size, duration and costs of three main types of sector review study have been derived from a detailed summary analysis of 49 Agricultural Sector Studies (referred to as Public Expenditure Reviews) funded by UKaid (Draft Practitioners' Toolkit for Agriculture Public Expenditure Analysis: World Bank and DfID 2010). Although these data apply to agricultural sector reviews rather than to the livestock sub-sector, so some down-

ward adjustment might be justified, they are based on recent field experience in conducting sector reviews and are therefore worth quoting.

- **Comprehensive review of the whole sector:** Such a study is undertaken as a detailed, self-standing sector-wide review. The main objective may be economic growth or poverty relief. **Suggested length:** 80-100 pages, **duration of study:** 2 years, **cost:** US\$ 250,000 to US\$ 350,000
- **Rapid reviews:** These are intended to deepen policy dialogue, frame strategic action plans, guide project preparation and contribute to broader multi-sectoral reviews: **Suggested length:** 15 pages, **duration of study:** several months, and **cost:** US\$ 50,000 to US\$ 100,000
- **Thematic reviews:** These are concerned with a specific livestock sub-sector programme, particular livestock species/ enterprise or project. They may involve a comprehensive or a rapid review of a particular theme. **Suggested length:** 80 pages, **duration of study:** 2 years

A further category may be added in the context of livestock policies, namely:

- **Very rapid reviews:** These may be required for immediate response to emergencies. They are likely to be focussed on a very narrow area but need to be set in the context of the broader sector background and development objectives. This is to ensure that the emergency response does not destabilize livestock sector development plans. **Suggested length:** 10-15 pages, **duration of study:** 3 months **cost:** US\$ 50,000

All types of livestock sector review are best conducted by livestock economists and livestock production specialists. In some cases a veterinary epidemiologist or a GIS data manager should be included in the team. However, it may also be possible to hire the services of other disciplinary specialists, preferably from within the country, in the course of the review study. The team should include government staff, to contribute local knowledge and ensure continuity and compatibility with other policies, a knowledgeable, representative stakeholder from the private sector and international staff that can provide information and experience from external sources.

It should also be added that the suggested lengths, durations and costs listed above probably represent the maximum feasible resource inputs. The practical reality is that the client often requests the review, to make an investment decision, support an emergency action or check policy decisions already made, at very short notice. This may explain why detailed reviews are few and why, in practice, review teams focus so much on secondary data and why some complex elements like feed budgets are often omitted.

In effect there is a trade off between the higher levels of detail and accuracy obtained from a lengthy and expensive comprehensive livestock sector review and the swifter response, greater immediacy and relative resource economies derived from a more rapid review. The pros and cons are set out in a little more detail below Table 1. Actual choices must depend on circumstances.

Comprehensive reviews and rapid reviews are not mutually exclusive. Where comprehensive reviews are only completed at long intervals, they may be supplemented by rapid appraisals for specific purposes. Alternatively a rapid review may be used to pave the way for a subsequent comprehensive review.