

SECTION B

Identifying livestock development objectives and strategies



Overview

RATIONALE

There is a need from the outset to clarify what objectives are to be addressed by the breeding strategy. Developments in the livestock sector, including any breeding activities undertaken, should ultimately aim to meet some desirable objective(s) in human development terms. These objectives will vary from one production system to another depending on the needs and aspirations of the livestock keepers concerned and those of other stakeholders at the local and national levels. Overall objectives will normally be set out in the country's existing livestock policy.

For any targeted production system it is necessary to identify how livestock development should fit into national strategies for the livestock sector. Livestock development objectives for the production system that are realistically achievable, given the current state of the system and the roles of livestock within it, should be identified. This requires knowledge of the policies and legislation that may promote or hinder particular development pathways. It also requires knowledge of economic, social, technological, environmental and climatic trends affecting the production system. Stakeholders' needs and aspirations also must be taken into account. On the basis of a careful analysis of information on all these aspects of the production system, it should be possible to elaborate a set of livestock development objectives (LDOs), which are clear and concise statements of high-level goals or targets specific to the production system. This calls for a medium- to long-term perspective.

Addressing LDOs will require a corresponding set of livestock development activities. These activities constitute the livestock development strategy (LDS). An LDS will typically use a combination of five broad components – breeding, feeding, health care, husbandry and marketing. The contributions of these components will depend on the LDOs and the development opportunities within the specific production system. By identifying the LDOs, and the LDS needed to achieve them, it should become clear whether a breeding strategy is required for a given species within the production system in question, and what the strategy needs to achieve. Box 5 describes some qualities that LDOs and the associated LDS should have if they are to be successful.

Failure to identify appropriate LDOs, or seeking to address the LDOs with a flawed LDS, increases the risks that:

- the LDOs will not be achieved fully because of unforeseen barriers caused by national policies or other constraints, or due to unreasonable expectations regarding livestock keepers' capacities and motivation to manage the desired changes;
- benefits in terms of poverty alleviation or social development will be lower than expected;
- economic, social and environmental costs will be greater than expected; and
- some functions of livestock keeping will be neglected, which may lead to unexpected and unwelcome consequences.



BOX 5

Qualities required in a set of LDOs and the associated LDS

For LDOs to succeed, they should provide a sound platform on which to develop an overall LDS and subsequently its breeding component. They should:

- be achievable;
- be sustainable;
- embody priorities for development over the medium to long term;
- recognize, consider and account for livestock keeping's various roles (e.g. providing food security and livelihoods in rural communities, contributing to the national economy and influencing the environment) and how they are changing;
- be supported by (and consistent with) policies that give a lead to livestock keepers, their associations and their service providers, encouraging them to become and remain involved in the development effort and even to champion it;
- recognize how different production systems can contribute to overall development objectives;
- recognize how the consequences of achieving the objectives may vary from one production system to another and among the different actors within them (e.g. men and women);
- recognize both national and international supply and demand trends for animal products;
- recognize environmental and social trends;
- recognize the implications of global climate change for each production system; and
- be based on wide stakeholder support and understanding.

An LDS for a specific production system should:

- address the agreed LDOs;
- be sustainable;
- be technically, institutionally and financially feasible, with an agreed time and schedule for implementation;
- not be socially harmful or disruptive, and should have no negative impacts on women or minority groups;
- integrate different strategic components, such as breeding, feeding, health care, husbandry and marketing;
- have a set of practical indicators for measuring progress towards the LDOs; and
- have wide stakeholder involvement, including clear allocation of responsibilities for implementing the actions that have been agreed upon.



This rationale is relevant to national and regional governments. It is clear that the activities described in this section are not intended to be undertaken by a local community or cooperative seeking to introduce a breeding component into their activities. However, it is worthwhile for these groups to identify LDOs and an appropriate LDS for their country (region), as this will help them to identify and respond to future developments and trends.

OBJECTIVES

Identify achievable LDOs and design an LDS to achieve the LDOs for all important production systems within the country (region), placing particular emphasis on assessing whether there is a need for a breeding strategy and what its role might be.

INPUT

The input for this section is the list of stakeholders that will have been prepared during the implementation of the tasks described in Section A.

OUTPUTS

The outputs will be:

- an inventory of policies and legal instruments along with knowledgeable contacts;
- a report in which the LDOs are described; and
- a report in which the LDS is described.

TASKS

The following tasks need to be undertaken in order to achieve the above objectives:

1. Prepare the livestock and enabling policy assessment.
2. Prepare the production systems assessment.
3. Prepare the trends assessment.
4. Identify livestock development objectives.
5. Identify the livestock development strategy.

Box 6 provides general guidance on how to get the most out of identifying LDOs and designing an LDS. It emphasizes the fact that good documentation is an investment for the future and shows the importance of concentrating on the fundamentals at the beginning of the process. Some of the questions posed in Tasks 1 to 3 are challenging, and reliable information may be scarce or unavailable. Missing or uncertain information can be flagged and the need for further data collection highlighted.



BOX 6

Getting the most from identifying LDOs and the associated LDS

Developing inventories of stakeholders, policies and legislative instruments, and understanding the different production systems within the country will require dedicating considerable time and effort to research and collating information. Clear inventories are important outputs and should be valued as resources that will allow future assessments to focus more directly on understanding and analysing how all these elements fit together. Sources (both documents and experts) should be carefully listed and accompanied by notes on their provenance and on the degree to which they are informative. The information assembled should be used to identify and record strengths and weaknesses within the agricultural and livestock sectors.

When developing the LDOs it may be useful to consider the following questions:

- What are the social and economic roles of agriculture generally and livestock in particular?
- To what degree do policies enable livestock development to address the needs of communities and of different groups (consider age, social status, profession, etc.) within the communities?
- What needs to be done to improve nutrition, alleviate poverty and promote sustainable livelihoods?
- What is a realistic assessment of livestock keepers' capacities and motivation to participate in an LDS?
- Are current practices within the production systems environmentally sustainable?

If an existing set of LDOs and the LDS are being further developed, some of the work of compiling inventories will already have been done, and experience will have been gained. Consider the following additional questions, which may help to strengthen the LDOs:

- How might the analysis be modified in light of the successes and failures of previous LDOs?
- Do the LDOs recognize the roles played by different AnGR in livestock production and rural communities?
- Do the LDOs ensure that benefits accrue to both the livestock-keeping and consuming sectors of the community?
- Do the LDOs promote livestock keepers' involvement (without a gender bias) with support services and in capacity building?
- Do the LDOs adequately recognize different gender roles in livestock management?
- If the LDOs provide for intensification of production systems, is this intensification sustainable economically, socially and environmentally?



Tasks and actions

TASK 1: PREPARE THE LIVESTOCK AND ENABLING POLICY ASSESSMENT

The purpose of completing this task is to answer the following questions:

- What are the social and economic roles of agriculture in general and of livestock in particular?
- To what degree do policies enable an LDS to address the needs of communities?

During this process, information will also be obtained on the policies that influence livestock keepers' capacities and motivation to participate in the LDS and on the sustainability of the production systems. This will help to answer the following questions:

- What is a realistic assessment of the livestock keepers' capacities and motivation to participate in the LDS?
- Are current practices within livestock production systems environmentally sustainable?

Action 1: Obtain the relevant information

This first action is simply stated, but is challenging and time-consuming. Obtain copies of the most recent overall plans, policies and legal instruments affecting agriculture. It may be appropriate to hire consultants to do this before the working group meets.

Policies and legal instruments in the following areas should be considered:

- production inputs and outputs;
- availability of agricultural services (e.g. extension services and recording services);
- food security;
- poverty alleviation;
- sustainable livelihoods and the development of rural communities;
- credit and finance facilities;
- market development and trade;
- farmers' and livestock keepers' organizations;
- public-private sector involvement; and
- incentive systems.

Other policy areas that may be relevant and require documentation at this stage include food safety, import/export regulations (notably those concerning animal material), prevention or control of animal diseases (particularly transboundary diseases), biodiversity, animal welfare, minority groups (including pastoralists) and land tenure.

Policies and legal instruments affecting AnGR may emanate from a variety of government departments and ministries, including those concerned with food production, food safety, rural development and credit, employment, trade and marketing, tourism and culture, nature conservation and the environment, animal quarantine and biosecurity and social and individual security. Other countries' policies and legal instruments, particularly those that



affect trade, may also be relevant. For example, the European Union places restrictions on the import of food products from countries where foot-and-mouth disease is endemic, and it sets standards for the quality of imported food.

The country reports developed during the preparation of *The State of the World's Animal Genetic Resources for Food and Agriculture* (FAO, 2007) may be valuable sources of information on livestock-related policies. If a set of LDOs has been well prepared previously, it should prove an excellent point of reference.

Note that agricultural policies may appear under various names – “livestock plan”, “livestock strategy”, etc. They may cover a year or a longer period, but short-term plans are less relevant to the development of an LDS than long-term plans because the strategies, particularly if they include breeding strategies, need to be sustained for a long period. Documents related to national budgets may also offer useful information on planned livestock-related activities, particularly when details in agricultural plans are minimal or non-existent. Examine policy documents other than those concerned directly with agriculture.

Consult informed people from the relevant government ministries and other stakeholders who have been involved in policy development or implementation. Such people are often extremely valuable sources of information that can clarify ambiguities in the documentation. Ask them to provide ideas regarding how current and possible future policies may affect agriculture. Prioritize the search for information, particularly where time is limited. Build a foundation for the future by preparing a clear inventory (e.g. a spreadsheet) of the policies and legal instruments. Specify where the information has been collected and when, describe its relevance and, if appropriate, provide a contact.

BOX 7

Livestock policy is indispensable for formulating a breeding policy

The first attempt to formulate an animal breeding policy in the United Republic of Tanzania was made in 1991. In 2003, a second attempt led to the presentation of a draft animal breeding policy. However, the Ministry of Agriculture realized that no livestock policy was yet in place and gave priority to establishing one, which was done in 2006. In March 2008, an FAO workshop on policies and strategies for the development of AnGR was held in Dar es Salaam, with the objective of revitalizing the draft animal breeding policy. A new task force was given the job of reformulating the policy. Similar cases in other countries, such as Burundi, illustrate that before formulating a breeding policy it is important to establish a comprehensive livestock policy that defines livestock development objectives and associated strategies.

Provided by Sachin Das.



Action 2: Clarify the role of livestock in the country's major production systems

This action addresses the question: What are the social and economic roles of agriculture generally and, in particular, livestock production? The production systems within the country or region will be identified. The production system classification developed at this stage will be used throughout the rest of the planning process because all development must be appropriate to the production system and its capacity for change.

1. Identify the most important production systems in the country (or region). This will require technical assistance from a livestock production and development specialist. Even if a list of production systems is already available (e.g. from a previous set of LDOs), it should be reviewed and, if necessary, revised to ensure its appropriateness and relevance. To enable the working group to address it adequately in the time allotted, avoid making the list too long. If necessary, refine the list by grouping systems with similar characteristics. For example, intensified systems, those driven by agro-ecological considerations and those that potentially play important roles in poverty alleviation. Subsequent revisions of the LDOs can expand and strengthen the list.
2. Develop an inventory of the contributions of livestock to all aspects of the community. Draw on a wide range of sources including technical, sociological and farming-systems research, as well as relevant policies and legal measures. Livestock's contributions may include inputs to crop production (manure and draught power), marketed and non-marketed animal products, employment and social and cultural roles. Carefully identify all livestock functions, paying special attention to non-monetary benefits, non-quantifiable contributions and indirect and long-term benefits (Box 8). Be aware that customs may have a rational basis and serve production and management purposes. (For example, pastoralists have relatively large herds not for prestige or because of cultural attachment to their animals, but as a risk reduction strategy). Classify the roles that are relevant to each of the major production systems identified. Review the results by comparing them to existing literature, consulting researchers working on farming systems or socio-economics and meeting with extension service agents and local livestock keepers. Revise the list if necessary.
3. Quantify the contributions of livestock wherever possible. Quantitative measures may be available from documentation associated with policies and legal instruments. If this is the case, examine whether the documents actually provide a full description of the roles of livestock. Seek technical assistance to do this and to derive new measures if necessary. Ensure that the summary statistics are clear and meaningful. Where quantitative measurement is not possible, provide an estimate – for instance, to the nearest 10 percent, or even more approximately (e.g. “high”, “medium” or “low”). Note any major differences between the roles that livestock play in different production systems.
4. Examine policies and legal instruments that affect food and agricultural production and assess whether they adequately recognize the importance of livestock, both for its contributions to food and agricultural production and to society and culture. Note whether major differences among the production systems are adequately recognized. If they are not, note which contributions are neglected.



BOX 8

Measures of livestock's importance

Economic importance, based on marketed products. The following measures are based on marketed outputs from livestock:

- the contribution of livestock products to agricultural GDP;
- the contribution of livestock products to the rural economy;
- the contribution of livestock products to exports;
- the contribution of livestock products to meeting current and projected future demands for food; and
- the contribution of livestock-related activities to national employment.

Measures based on marketed products may grossly underestimate the importance of livestock because some important outputs may not be taken into consideration. For example, livestock in low-input production systems are often major providers of fertilizer for crop production.

Economic importance, based on non-marketed products and services. There is a need to account for the degree to which rural communities are reliant on non-marketed livestock products and services as inputs to crop production and to meet household needs – items that would otherwise need to be purchased or obtained through other means. Examples include:

- fertilizer for crops;
- draught power for ploughing and transport;
- food for the household (milk, meat, eggs);
- fibre and hides for clothing, housing, rope, containers and other household goods;
- dung for fuel and plaster;
- savings, absorption of surpluses, buffering of fluctuating income, risk management; and
- long-term livelihood security.

Social, cultural and environmental importance. Social and cultural processes that involve livestock need to be considered, as do any ecological or landscape services that livestock provide. Examples include:

- social relations/cohesion (social capital) forged and sustained via livestock transactions;
- gender roles – women derive status, autonomy and security from owning, holding in trust, transferring, managing and marketing livestock and livestock products;
- local and indigenous knowledge;
- maintenance of habitats for wild biodiversity; and
- interactions between livestock and minority groups including indigenous peoples.



5. Draft the first part of the livestock and enabling policy assessment. This will involve:
- listing and briefly characterizing the production systems identified. Characterization should include:
 - the balance between subsistence and marketed production,
 - land tenure,
 - the kinds of people involved (e.g. their gender or whether they are indigenous peoples),
 - number employed and type of employment, and
 - the kind of institutions supporting agricultural activity (public, private or cooperative);
 - describing the roles of livestock in the various production systems and, as far as possible, quantifying their contributions; and
 - collating the results of the analysis of policies and legal instruments.

Action 3: Summarize policies and legal instruments

The following questions should be addressed directly:

- To what degree do policies enable the LDS to address the needs of communities?
- How do policies influence livestock keepers' capacities and motivation to participate in an LDS and the environmental sustainability of production systems?

There is no model set of criteria against which a country can judge the adequacy of its policy and legal instruments. Countries' needs are diverse and different countries may take different approaches to legislation and policy-making in order to achieve the same ends. Careful assessment of the various policy and legislative areas that may affect the development of different countries' production systems is therefore required. Again, it is not possible to present a model set of procedures for describing the variety and complexity of livestock development across all countries, each of which has its own social and cultural characteristics. Consideration should be given to instruments that affect the production environment, the livestock themselves, the supporting infrastructure and human participation in development.

Policies and legal instruments related to the environment. Livestock can have both positive and negative impacts on the environment. For example, while the effects of grazing and manuring can increase species diversity in vegetation and soil, overgrazing diminishes diversity and promotes soil erosion. Consideration must be given to the effects that policies and legal instruments may have on the environment, both locally and more broadly. Use Box 9 to identify potential environmental issues. Examine the policies and legal instruments and consider whether and to what degree they promote unsustainable use of environmental resources or inhibit sustainable intensification of production systems. Recognize the need to prepare for climate change and its potential impact on food and agricultural production. Note whether policies and legal instruments related to the interactions between livestock and the environment are integrated into wider environmental policies, such as national action plans on biodiversity. Note whether policies are in place that affect particular production systems (e.g. those within national parks). Obtain relevant technical assistance to address the issues raised and to assess their implications for the LDS.

Policies and legal instruments related to livestock. Identify policy and legal instruments that affect the management of livestock (Box 10). Obtain appropriate technical



BOX 9

Livestock-related environmental issues potentially targeted by policies and legal instruments

Policies and legal instruments related to the following environmental issues, *inter alia*, may need to be considered when developing livestock development and breeding strategies:

- soil erosion associated with grazing systems;
- depletion of soil nutrients;
- disposal of animal waste;
- water availability and management;
- water pollution;
- gaseous emissions associated with climate change;
- forest conservation and management; and
- the integration of livestock management with the management of wild flora and fauna.

assistance to interpret their implications for the LDS. Note whether policies that affect particular production systems exist.

Policies and legal instruments related to the supporting infrastructure. Identify policies and legal instruments related to the supporting infrastructure for livestock development and obtain appropriate technical assistance to interpret their implications for the LDS. (Box 11 lists issues to consider.) Note any deficiencies and how particular policies affect particular production systems.

Pay particular attention to policies and legal instruments concerned with extension services and research and development (including funding), and consider the affect they may have on the LDS. Bear in mind whether these provisions cover the full range of strategies available to improve livestock production (i.e. breeding, feeding, health care, husbandry and marketing). Note any deficiencies. Consider whether policies and legal instruments provide for the following:

- adequate planning and reviewing of research and development priorities;
- mechanisms for livestock keepers, their associations and support services to become involved in planning and reviewing research and development and implementing the outcomes; and
- effective translation of research and development into practice.

Policies and legal instruments related to human participation. Identify policies and legal instruments affecting human participation in livestock development. Obtain appropriate technical assistance to interpret their implications for LDS. It is important to consider, *inter alia*, how policies and legal instruments affect:

- the role of indigenous knowledge;
- gender roles (e.g. in livestock husbandry);
- benefit-sharing among community sectors (e.g. livestock keepers, retailers and consumers);
- pastoral communities;



BOX 10

Aspects of livestock management potentially targeted by policies and legal instruments

Policies and legal instruments related to the following livestock management issues, *inter alia*, may need to be considered when developing livestock development and breeding strategies:

- use of local breeds and introduction of exotic breeds;
- development of straight-breeding and cross-breeding programmes;
- value of AnGR adaptations to specific environments and production systems;
- use of reproductive and molecular biotechnologies;
- structure of markets to encourage livestock keepers' participation;
- responsiveness of markets to products from improved stock and special products;
- recognition of at-risk breeds and procedures to monitor them;
- provision of extra support for funding conservation programmes for at-risk breeds;
- conservation and use of feed and water resources;
- safety of feeds for animal consumption;
- quality of feeds to ensure safety of products for human consumption in domestic or export markets;
- administration of veterinary drugs and vaccines;
- quarantine requirements;
- import and export of AnGR;
- procedures for disease surveillance and control;
- access to veterinary services;
- geographic location and density of livestock and their housing;
- movement of flocks, herds and individual animals;
- health and safety of workers in the livestock sector;
- animal welfare – as affected by housing, feeding methods, milking, slaughtering and use of animals for work;
- barriers to trade in livestock or livestock products related to the production environment or disease problems; and
- marketing needs for different species.

Other relevant policy areas include:

- decentralization (newly created municipalities may impose access rules or movement restrictions for livestock);
- land tenure;
- settlement of nomadic pastoralists or use of pastoral land to resettle crop producers; and
- tourism (e.g. the development of game parks may affect livestock keepers' access to grazing grounds).



BOX 11

Supporting institutions and services potentially targeted by policies and legal instruments

- Extension services
- Research and development services
- Finance and credit services
- Market access
- Transport services
- Breeding associations and breed societies
- Veterinary associations
- Agricultural training
- Direct or indirect government incentives or disincentives for the use of particular breeds or breeding stock or for the production of particular products
- Information technology (e.g. data-protection acts restricting access to recording databases)
- Gender policy affecting the operations of extension services, research institutes and financial service providers (e.g. defining a female target group or prescribing special loan conditions for women)

- land tenure and ownership;
- smallholders; and
- the availability of microcredit.

Consider whether policies and legal instruments take into account the differing capacities of livestock keepers and other stakeholders in different production systems. Analyse whether policies and legal instruments strengthen or weaken livestock keepers' capacities to participate in breeding strategies, noting any major differences among production systems. Assess the risk of excluding certain groups (e.g. women, nomadic pastoralists or members of particular castes or tribes).

Action 4: Complete the livestock and enabling policy assessment

Consider the following question and summarize the conclusions: To what degree do policies enable an LDS to address the needs of the communities? Summarize how policies influence livestock keepers' capacities and motivation to participate in an LDS and the environmental sustainability of current production systems. Where possible, assess and comment on the degree to which previous policies have been effective; assess the reasons for any failures (Box 12).

TASK 2: PREPARE THE PRODUCTION SYSTEMS ASSESSMENT

The production systems assessment should fully answer the question: What are the needs for improved nutrition, poverty alleviation and sustainable livelihoods? It should provide concrete evidence on livestock keepers' capacities and motivation to participate in an



BOX 12

Policy-related constraints – the case of Nagauri cattle in Rajasthan, India

In Rajasthan, India, animal welfare regulations interfere with the breeding of the Nagauri draft cattle breed. The demand for these animals is high in neighbouring states – for instance for rice cultivation. To prevent their illegitimate slaughter, animal welfare regulations prohibit the transport of the Nagauri cattle across state borders. However, the regulations also stop the cattle from being sold for other purposes. Selling the animals not only allows livestock keepers to make a profit, but it also contributes to the sustainable use and conservation of the endangered Nagauri. The consequence of the transport restrictions is that livestock keepers give up breeding the Nagauri.

The actual implementation of enabling policies may represent another obstacle. After decades of promoting cross-breeding only, the Indian Department of Animal Husbandry has changed its policy and now supports indigenous breeds. However, government veterinarians are still obliged to carry out a certain quota of artificial inseminations; the only semen available for this purpose is from exotic breeds.

Policy-related constraints to implementation need to be taken into consideration when preparing a breeding strategy.

Provided by Ilse Köhler-Rollefson.

LDS and on the environmental sustainability of current production systems. It should also provide an initial assessment of the opportunities for development within each production system, based on its capacity for change.

In the actions that follow, 1 and 2 address the human and livestock structures of production systems. Action 3 deals with the environmental aspects of production systems. Action 4 involves a SWOT (strengths, weaknesses, opportunities and threats) analysis of the production systems being considered. Action 5 summarizes the outcomes of the previous actions. Checklists are included that will help generate the relevant information. These actions will need to be repeated for each of the production systems identified in Action 1 of Task 1. The production systems assessment report is simply a compilation of the summaries produced for each of the main production systems.

Action 1: Describe the human structure of livestock-keeping communities

In order to assess the capacity and motivation of livestock keepers to participate in an LDS (i.e. their ability and willingness to change), it is necessary to find out how people manage their livestock and what needs are satisfied by livestock keeping.

1. Describe the communities associated with the production system and the social structure of the households within these communities. Relevant information can probably be obtained from publications, in particular those related to farming systems research, anthropology and socio-economics. Studies conducted by NGOs may be useful sources. If such published information is not available, then communities should be visited. Sufficient



time and budget must be made available along with the relevant expert technical input. Interviewing livestock keepers requires specific expertise, adequate preparation and careful selection of interviewees. Superficial fieldwork will only confirm stereotypes.

Estimate the area of land under the production system, the number of holdings within the production system and the approximate number of people within the holdings. Calculate the average area of land per holding (or the extent of communal grazing areas) and the average number of people per holding.

2. Assess the nutritional well-being of the people within the production system. This will require specific technical input. The assessment will need to consider separately the diets of adults, pregnant women and children. Estimate the proportion of households, and of individuals within each of the demographic groups, that suffer from inadequate nutrition. Where inadequacies exist, note in what way(s) diets are deficient. Determine whether there is evidence of diseases caused by malnutrition and, if so, note how the diseases are treated at present.
3. Assess the economic well-being of the households within the production system. This will require specific technical input. Provide an estimate of the proportion of households categorized as poor by relevant defined standards. This should be considered in the context of poverty in both rural and urban communities within the region and country.

Action 2: Describe the livestock structure of the holdings

In order to assess a production system's capacity and potential to change, the livestock structure and husbandry practices must be examined.

Using expert technical input, characterize the livestock structure of holdings within the production system. The checklist in Box 14 can help in this characterization. Key variables that characterize a production system include:

- size and species composition of herds or flocks;
- inputs (from both internal and external sources);
- outputs (to both internal and external users/customers);
- management; and
- breeding.

Many of these variables are conditioned by non-technical factors, such as livestock ownership, decision-making processes, rules governing access to resources (feed, pasture and water), availability of labour, distribution of benefits (rights and responsibilities) and gender issues, all of which need to be taken into account. Finally, risk and other factors that limit the productivity of livestock within the production system must be identified, as they may affect the system's potential for development.

Action 3: Describe the environment associated with the production system

Characterize the nature and the state of the ecosystems affected by the production system and the interactions of the production system with the environment, identifying any constraints or opportunities that arise from these interactions (Box 15). This will require expert technical input.



BOX 13

Questions on the human structure of livestock-keeping communities**A. Questions relevant to production systems and communities**

- Is the whole community or only a subgroup involved in the production system?
- Does a relationship exist between the production system and the social aspects of the community?
- Is the production system strongly associated with particular sections of the community?
- How many holdings per community is typical?
- Are the livestock owned by the community or within households?
- Do the livestock keepers and their households make decisions on:
 - day-to-day livestock-related actions (e.g. marketing, exchange and breeding purpose)?
 - strategic planning and development of livestock production?
- Alternatively, is the responsibility for livestock-related decision-making shared within community structures?
- If so, what kinds of community structures are involved?
- Do livestock in general, or particular livestock species or breeds, have cultural significance within the community?
- If so, what is the nature of this cultural significance?
- How does it influence livestock production within the community or within households?

B. Questions relevant to households and household assets

- What is the type of holding (e.g. subsistence oriented or market oriented)?
- Are the households fixed or mobile (nomadic or transhumant)?
- How many people make up a typical household within the production system?
- What is the age and gender profile of a typical household?
- What is the nature of land ownership or tenure in the production system?
- What is the nature of livestock ownership in the production system?
- If decisions on livestock are made within households (rather than within the community as a whole), who makes the decisions on:
 - day-to-day actions such as marketing, exchange and breeding?
 - strategic planning and development?
- What is the capacity of the households to participate in livestock development?



BOX 14

Characterizing a livestock holding**1. Composition of the herd or flock within a holding**

Describe the species composition and the size of the herd or flock in a typical holding (Table 3). Identifying specific breeds and breed types (e.g. cross-bred or straight-bred) within species is not necessary. However, some indication of the following is required:

- the relative use of locally adapted and introduced breeds (useful for assessing development opportunities and capacity); and
- the degree to which livestock keepers rely on replacement animals obtained from outside the holding.

2. Inputs

Describe, in general terms, the inputs to livestock production. Include those that come from within the holding as well as those from external sources.

- **Feed.** For each species, describe the nature, quality, quantity and seasonal fluctuations of locally available feed and the degree of reliance on feed from external sources. For production systems in which communal feed resources are used (pastoralism, semi-extensive systems), consider access to pastures and conditions for access.
- **Water.** Describe the sources and availability of water and possible seasonal fluctuations, noting the extent to which reliance on non-local sources is necessary. Note the conditions that apply for access to water and any factors that contribute to poor water quality.
- **Labour.** Describe the sources of labour for livestock keeping. Note the proportion of household labour devoted to livestock-related tasks (feeding, herding, milking, processing, marketing, etc.), the gender division of labour within the household/holding and the degree of reliance on labour from outside the household/holding.
- **Health care.** Describe the degree of reliance on veterinary services (vaccination and treatment) and on indigenous (ethnoveterinary) knowledge.

3. Outputs

Describe in broad terms the outputs obtained from each species kept (Box 8) and where they go. Answer the following questions:

- Does the output remain within the household/holding and does it meet the household's needs?
- Is there a surplus that is marketed (or exchanged for goods or services)? Approximately what proportion is marketed?
- Does the household add value to the product before marketing (e.g. processing milk into cheese)?
- For food products consumed within the household: How important is the product for meeting the household's nutritional needs for dietary energy, protein, vitamins and minerals?
- For other products used by the household: How feasible is it to obtain alternatives to these products and how much do they cost?



- For marketed products: Approximately how much is marketed per holding? What is its quality? Does the quality vary? Provide some measure of quality (e.g. fibre diameter). What is its relative importance to household income?
- For outputs of social or cultural value: What is a relevant measure of its significance?
- For a product that neither supplies the household nor is marketed: What are the reasons for this lack of use and is the product of potential value?

4. Husbandry variables

Describe how the livestock are managed. Answer the following questions:

- Are animals stabled, tethered, kraaled or otherwise confined? Are they confined all day, or for part of the day or night? Are they confined during mating?
- Are animals stall-fed or grazed? Is fodder cultivated? Are rangelands managed? Who is in charge?
- What are the main diseases and disease management activities?
- Do all holdings have animals of both sexes? Are the sexes allowed to mix continuously or only at mating?
- Are animals identified? If so, how? By parent group or individually? Subjectively or objectively?
- Is individual animal recording in place? If so, what kind (e.g. inputs and outputs relevant to health and performance)? Are measures subjective or objective?
- What local or introduced breeding technologies are used (e.g. exchange of males, artificial breeding techniques)?
- How are replacement animals obtained? Do they come from specialist breeders?

5. Risk factors and limitations to productivity

Describe the risks and limitations affecting livestock production. Answer the following questions:

- Is the environment subject to drought, flooding, fire, earthquake, plagues (e.g. locusts) or other natural disasters? If so, with what frequency?
- Is the production system threatened by significant environmental degradation (e.g. soil erosion)? If so, what kind and how severe?
- What are the diseases that cause significant losses in the various livestock species?
- Is livestock prone to significant predation?
- Are social disruptions (e.g. war or civil unrest, migration of labour to cities) a significant factor?
- Are key resources seriously limited in the production system (e.g. access to capital or credit, availability of labour)?

6. Sustainable opportunities for development

Describe the practical opportunities for sustainable livestock development in the production system. Where appropriate, include a description of the adequacy of access to markets.



TABLE 3
A framework for collecting data on the structure of a herd or flock

Production system					
Species	Sex	Number of breeding individuals	Average age of breeding individuals	Percentage of breeding replacements obtained on the holding	Percentage of breeding individuals belonging to locally adapted breeds
Cattle	Females				
	Males				
Buffalo	Females				
	Males				
Sheep	Females				
	Males				
Goats	Females				
	Males				

Action 4: Conduct a SWOT (strengths, weakness, opportunities, threats) analysis of the production system

Based on the information gathered during the previous actions that pertain to this task, assess the strengths and weaknesses of the current production system. This assessment should consider the conditions of the human population maintained within the production system including both its nutritional and economic states, the sustainability of the production system within its environment and the productivity of the production system. It is appropriate at this stage to consider a range of practical options for the production system and to identify major opportunities for development, along with threats to the system and its future development.

BOX 15

Characterizing the environment associated with a production system

- Briefly characterize the nature – including major seasonal features – and the state of ecosystems affected by the production system. Consider groundwater, forest and forest habitat, other flora, wild fauna and soil.
- Are components of the ecosystem sensitive to changes in livestock management?
- Are components of the production system sensitive to the possible effects of global climate change?
- Is there evidence that the production system causes environmental damage?
- How does the production system enhance ecosystems (e.g. providing organic fertilizer or maintaining habitats)?
- Do constraints or opportunities result from interactions between the production system and the environment? Are some of these constraints seasonal?



Action 5: Prepare the production systems assessment report

For each production system, summarize the outcomes from Actions 1 to 4. The resulting report should provide:

- answers to the question: What does the community need in terms of improved nutrition, poverty alleviation and sustainable livelihoods?
- practical evidence regarding livestock keepers' capacities and motivation to participate in an LDS;
- information on the environmental sustainability of current production systems; and
- information on any opportunities identified for development.

TASK 3: PREPARE THE TRENDS ASSESSMENT**Action 1: Review past performance**

Review past national developments (e.g. the last ten years). Relevant topics for the review are presented in Box 16.

For each production system identified (Action 1 of Task 1):

- identify whether trends in the production system have been stronger or weaker than national trends;
- describe past LDS within the production system and their impact;

BOX 16**Topics for retrospective assessment**

- Past policies and legislative instruments concerned with livestock development.
- National trends in the output of agricultural products.
- National economic performance of agriculture in general and livestock production in particular.
- Institutional changes relevant to livestock development.
- Changes in market structure for agricultural products in general and livestock products in particular.
- Changes in market demand for agricultural products in general and livestock products in particular.
- Trends in human health (e.g. proportion of people with nutritionally deficient diets) – consider urban and rural communities separately.
- Trends in social structure (e.g. regional depopulation and urbanization, proportion of population dependent on agriculture and livestock for income, prevalence of poverty in rural and urban communities, gender roles and the status of rural communities).
- Changes in environmental conditions (e.g. soil erosion, desertification, and frequency and severity of droughts). Note that this may require a perspective of more than ten years.
- Trends or shifts in the focus of foreign aid projects.



- describe any changes in livestock practices that were not associated with development strategies; and
- describe changes in livestock keepers' capacities.

Action 2: Predict the consequences that social trends will have on production systems

Box 17 presents relevant questions for analysing social trends. For each production system, note whether the consequences are likely to be more or less marked than the overall national picture.

Action 3: Predict the consequences of environmental trends for livestock production systems

1. Obtain information on regional climatological trends predicted by climate change studies. Assess the implications of these trends for the production systems under consideration. For example, if historically (e.g. for the last 50 years) severe droughts have occurred on average once every five years and it is predicted that climate change will bring about a 20 percent decline in precipitation by 2050, what is the predicted frequency of droughts over the next 50 years? Expert technical assistance is needed for such climatological analysis. Note that projections of future climate change depend on assumptions regarding the degree of international action and its coordination. It is also estimated that there will be a time lag of approximately 20 years in the response of the climate to any such mitigating actions that are taken. For example, if an agreement on the reduction of greenhouse gas emissions were to be reached in 2010, it would not influence the projected trends until about 2030. At the time of writing (2009), global action to address climate change is minimal and poorly coordinated, and therefore it is recommended that assessments be based on more pessimistic scenarios (Box 18).
2. Predict the consequences of environmental trends (climate change, pollution, soil erosion, deforestation, desertification etc.) for food and agricultural production nationally or regionally. Consider whether the availability of resources such as forage and water will decline and whether this will influence the viability of keeping particular livestock species or breeds and the stocking densities at which they can be kept sustainably. Also consider factors that may affect the sustainability of production systems over the longer term (e.g. more severe droughts, or more frequent ones, with less time between them for livestock populations to recover). Assessing these impacts requires expert technical input. While predictions will be informed by evidence of the effects of past climatic trends on livestock production, consideration will also need to be given to emerging evidence of the effects of climate change. Note that the most serious effects of climate change on livestock production may result from the frequency of extreme climatic events, rather than from changes in the average temperature or rainfall.
3. Predict the impact of environmental trends for each production system by noting whether the consequences identified in the preceding step are distinct from the picture for the country or region as whole. This will also require expert technical input.



BOX 17

Questions and issues for analysing the impact of social trends on production systems

- What is the expected rate of growth of the national or regional human population? Disaggregate expected changes in birth rate, infant mortality and adult mortality.
- What are the expected trends in economic well-being? Disaggregate rural and urban communities.
- What are the expected trends in regional and rural depopulation and urbanization?
- What are the major causes of these trends?
- What are the aspirations of young people of each sex?
- Consider educational aspirations and attitudes towards work in livestock keeping as well as towards alternative activities, including urban employment.
- Consider how they will influence trends in regional and rural depopulation and urbanization.
- What other forces or drivers are affecting rural communities?

For all of the above, discuss consequences for:

- demand for agricultural products – consider this in relation to achieving national food security, the type of products produced and their quality;
- gender roles within communities and households involved in agriculture, particularly those in livestock production;
- the nutritional needs of households involved in agriculture, particularly those in livestock production;
- availability of labour for agriculture and for livestock production in particular;
- the economic status of households engaged in agriculture, particularly those in livestock production; and
- the proportion of population dependent on agriculture, particularly those in livestock production, as a source of income.

Action 4: Predict future demand and supply trends

In predicting future demand and supply trends, consider both quality and quantity. A minimum list of commodities to consider would include finance and credit, transport, labour, land, natural resources (e.g. water and forage), technological inputs and livestock outputs. Where appropriate, trends should be summarized in terms of price projections, which will require considerable technical input. An approach is outlined in Box 19.

Action 5: Prepare the trends assessment report

Summarize the outcomes of Actions 1 to 4. Conclude the discussion by considering whether trends have been characterized in sufficient detail to enable an informed and constructive debate among stakeholders on the critical social, agricultural and environmental trends that may affect future livestock production and the speed of change; and broad opportunities for identifying LDOs that will be relevant in the medium and long terms.

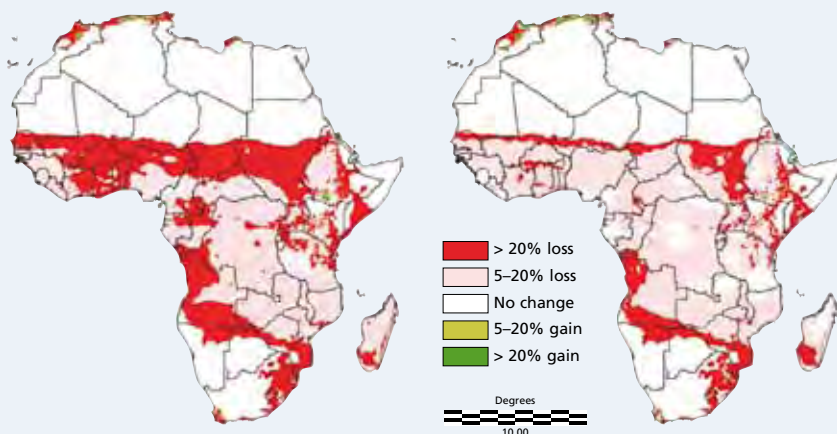


BOX 18

Scenarios for the potential impact of global climate change on the length of the crop growing period in Africa

The two maps shown below represent extremes (i.e. a high greenhouse gas emission scenario and a low emission scenario) for potential impact of climate change on the length of the growing period (LGP) in Africa, taken from a range of scenarios. The scenario illustrated in the map on the left assumes very rapid global economic growth, global population peaking mid-century, rapid introduction of new and efficient technologies and an emphasis on fossil fuel energy. The scenario illustrated in the map on the right assumes global, rapid change to service and information economies, global population peaking mid-century, introduction of clean and efficient resource technologies and global planning but no new climate initiatives. The colours deep red, light red, white, light green and green, respectively, represent reduction in excess of 20 percent, reduction of 5 to 20 percent, no change (less than 5 percent), gain of 5 to 20 percent and gain in excess of 20 percent. Regions gaining 5 percent or more in LGP occupy considerably less than 1 percent of the coloured area in either map; examples in both maps are limited to the North African coast and to a small area to the south of the Great Rift Valley in Ethiopia.

LGP Change, 2000–2050, HD



Note: Maps are derived using the Hadley Centre Coupled Model, version 3.

Source: Thornton *et al.* (2006).



TASK 4: IDENTIFY LIVESTOCK DEVELOPMENT OBJECTIVES

Action 1: Identify priority human objectives

1. Review the information gathered during the three previous tasks, focusing particularly on the human population's needs and aspirations and how they may change or be forced to change as a result of changing circumstances.
2. Prioritize broad human development objectives for each primary production system. Ensure that this development is relevant to future social and economic conditions. The objectives might concern, *inter alia*, achieving food security, alleviating poverty, providing sustainable livelihoods, increasing economic development or securing and managing the environment.
3. Provide guidelines concerning the time frames over which the development objectives should be evaluated for each production system. Note that, to be sustainable, they will have to be relevant over the medium and long terms. Focusing on the short term may lead to unsustainable objectives and a situation in which short-term benefits are dissipated, development is set back and the production system is unable to adapt sufficiently quickly to medium- and long-term demands.
4. Document the prioritized objectives and time frames for each production system in the first part of a consultative draft report on the LDOs.

Action 2: Identify livestock development objectives

1. For each primary production system, use the production systems assessment, the trends assessment and the livestock and enabling policy assessment to identify and examine options for achieving the priority human objectives through livestock development. A preliminary outline of the options may have been prepared under Action 4 of Task 2, but at this point the full spectrum of relevant options should be considered.

Obtain technical assistance to assess each option over the short, medium and long terms with respect to:

- the degree of development that can realistically be expected over a given period of time;
- how development based on the option may be affected by the social, economic and environmental trends that have been identified;
- the effectiveness of the option in addressing the priority human objectives that have been identified;
- the changes in enabling policy that may be necessary or desirable in order to implement the option;
- the strengths and weaknesses of the option;
- the external threats that may undermine success in implementing the option; and
- possible indicators for measuring progress towards the implementation of the option.



A suggested method for assessing potential options for inclusion in the LDOs is presented in Table 4. It is important to consider the feasibility of the development options as a function of time. Consider the capacity of the production system as identified in the production system assessment and the trends identified in the trends assessment. Be aware of trends that may affect productivity within the production system, such as the costs of inputs and the availability of labour. Also consider possible threats to production, such as increases in the frequency and severity of droughts.

2. Summarize the outcome in a consultative draft report. Ensure that it summarizes all options, irrespective of assumed utility, as the consultation may identify means to overcome the perceived problems.
3. Contact each of the relevant institutional stakeholders from the list compiled (Section A). Seek the assistance of appropriate experts in determining the modalities of the consultation. Send the report to the stakeholders and ask for comments. Summarize the stakeholders' responses and append the summary as an annex to the consultative draft.
4. Draw on the responses obtained during the consultations to draft the LDOs. They should be expressed as a set of concise statements – generally a small number for each production system. Each statement should be measurable and time bound. Longer-term objectives should be accompanied by intermediate-term objectives to gauge progress.
5. Review the implications of the LDOs for enabling policy, and consider whether amendments and developments are needed to facilitate progress towards the LDOs. Reconcile these changes with the more general needs for policy development identified under Action 4 of Task 1. Design a time-bound plan for implementing any necessary policy changes. Append it to the consultative draft report.
6. Review the LDOs, and take into account the requirements listed in Box 5. If the review reveals inadequacies in the LDOs, revise the objectives and repeat the review process. If the LDOs are adequate, add them as the conclusion to the report. Send the finalized report to the responsible authorities asking them to agree to and formally accept the LDOs.

TASK 5: IDENTIFY THE LIVESTOCK DEVELOPMENT STRATEGY

The LDS determines how the development of each production system will achieve the objectives set out for it in the LDOs given the conditions described in the production systems assessment.

1. The first step in designing an LDS is to choose a set of criteria for ranking strategies. Possible criteria include:
 - likely impact as measured by the livestock keepers' participation and the spread of benefits among them;
 - likely contribution to the LDO elements that the strategy addresses;
 - the potential for ongoing development;
 - the scale of threats to the strategy;
 - the likelihood of sustainability; and
 - the approximate cost (Box 20).



BOX 19

Predicting trends in demand and supply**1. Obtain information**

Obtain price information relevant to each of the commodities considered. Relevant information can be located by:

- examining current prices and predicted consumption trends in local, national and world markets;
- identifying trends in market preferences for quality aspects of the commodity (in particular, those that may influence the relative price of local products compared to those from external sources);
- identifying trends in the availability of resources; and
- examining schedules for changes in the regulation of global markets and the predicted outcomes of these changes.

Try to quantify prices in monetary terms, even if the current exchange practices are not based on money. General information on the local availability of commodities will have been obtained by completing the actions related to social and environmental trends. The World Trade Organization is a useful starting point for information on the trends in the global market and on regulation (<http://www.wto.org>).

2. Predict changes in prices

Predict changes in the prices of each commodity over 5, 10 and 15 years. This is an uncertain task, which inevitably involves subjective judgement. Try to be as objective as possible (e.g. consult a statistician), but *reflect carefully before making simple historical extrapolations*. While historical trends are relatively easy to obtain and may represent the best guess for future trends, be aware that they may not continue. Factors that may distort or reverse historical trends should be identified. Possible examples include:

- changes in enabling policies and legislation;
- trade agreements;
- environmental factors such as limitations of sustainable stocking density; and
- consequences of climate change.

3. Prepare a summary

Summarize the analysis. Include the sources drawn upon and a description of how the trends have been calculated. For each commodity, comment as to whether the degree of uncertainty in future price is large, medium or small in relation to the absolute price. Where feasible:

- Present values that represent the median of the possible range (i.e. it is estimated that the chance that the price will be higher than this value is equal to the chance it will be lower).
- Present a value that represents the lower quartile (i.e. it is estimated that the chances are three times as great that the price will be higher than this value as that they will be lower).
- Present a value that represents the upper quartile (i.e. it is estimated that the chances are three times as great that the price will be lower than this value as that they will be higher).



TABLE 5
Identifying feasible options for addressing the LDOs for a production system – an example

Production system name: smallholder Delta Region				
Agreed LDO element	Livestock (species)	Strategic component	Feasible options	
1. By 2012, increase smallholder income from livestock by 50%	Chickens (scavenger)	Breeding	1.1 Introduce and substitute chicks of a higher-producing breed from a similar production system	
			1.2 Initiate a selection programme in three local communities based on a breeding tier	
		Feeding	1.3 Promote the strategic use of supplementary feed in the first six weeks of life	
		Health	1.4 Introduce vaccination against Newcastle disease	
		Husbandry	1.5 Develop night housing to protect against predators	
			1.6 Community training on the subject "profit from chicken production"	
		Marketing	1.7 Develop community infrastructure to market excess eggs and chickens to the city	
	Cattle	Breeding		
		Feeding		
		Health		
		Husbandry		
		Marketing		
	2. ...			

2. Seek specific technical assistance in carrying out this task. For each of the production systems considered, identify feasible options for addressing the LDOs using the various strategic components of livestock development (breeding, feeding, health care, husbandry and marketing). A spreadsheet may be useful; an example is shown in Table 5.
3. Taking into account both the start-up phase and ongoing implementation, consider the following for each strategy option:
 - requirements for specialized human resources, their availability and any capacity-building requirements;
 - special institutional and infrastructural requirements – the mix of public-sector and private-sector participation as well as policy, operational and technical requirements; and
 - approximate costs.

A spreadsheet may be useful for collating the information. An example is shown in Table 6.
4. Based on the criteria developed by completing the previous task, consider each strategy option in terms of its impact and benefits. A spreadsheet may be useful; see the example presented in Table 7.



TABLE 6
Capacity and institutional requirements and costs of strategy options addressing the LDOs for a production system – an example

Production system name: smallholder Delta Region		Capacity and institutional requirements				Broad costing	
Feasible options		Human resources	Getting started	Ongoing	Private services	Public instruments and services	Ongoing
			Public instruments and services	Human resources	Private services	Public instruments and services	Getting started
1.1 Introduce and substitute chicks of a higher-producing breed from a similar production system	Type:						
	Required:						
	Available:						
1.2 Initiate a selection programme in three local communities based on a breeding tier	Type:						
	Required:						
	Available:						
1.3 Promote the strategic use of supplementary feed in the first six weeks of life	Type:						
	Required:						
	Available:						
1.4 Introduce vaccination against Newcastle disease	Type:						
	Required:						
	Available:						
1.5 Develop night housing to protect against predators	Type:						
	Required:						
	Available:						
1.6 Community training on the subject "profit from chicken production"	Type:						
	Required:						
	Available:						
1.7 Develop community infrastructure to market excess eggs and chickens to the city	Type:						
	Required:						
	Available:						

BOX 20

Criteria for assessing the potential effectiveness of strategy elements**Criterion 1. Participation of livestock keepers and the distribution of benefits among them**

The proportion of livestock keepers participating in a livestock development strategy element and those receiving benefit from it are distinct measures of impact and should be treated separately. Useful measures of impact include the following:

- the spread rate of livestock keepers' participation in the strategy element (i.e. how long it will take for x percent of the livestock keepers to participate); useful values are 10, 50 and 90 percent of livestock keepers; and
- the rate of spread of the benefits among livestock keepers (i.e. how long it will take for y percent of the livestock keepers to benefit from the strategy element); useful values are 10, 50 and 90 percent of livestock keepers.
- The distinction between these measures can be seen from the following examples:

Breeding: the livestock keepers benefiting from the breeding schemes will not only include those participating in the straight-breeding scheme by recording and using improved breeding stock, but also the livestock keepers who obtain the improved breeding stock from them.

Animal health: the use of vaccines will primarily benefit participants, but when the participation rate is high the risk of epidemics is reduced, which may yield benefits to other livestock keepers.

Feeding: only participants will benefit.

Criterion 2. The contribution a strategy element makes to achieving the livestock development objective

This builds on the assessment of Criterion 1 by evaluating the impact that the strategy element would have on individual livestock keepers and interpreting it in terms of an LDO. This should provide a broad perspective on the expected benefit to be derived from the strategy element in terms of achieving the LDO. For example, if the LDO is to increase protein intake in rural areas by 20 percent, and vaccination is an element of the strategy, its expected contribution can be calculated on the basis of the proportion of livestock keepers who will vaccinate, the additional number of chickens that a livestock keeper who vaccinates will raise successfully each year for consumption or sale and the impact that this additional production will have on protein intake among those who depend on the livestock keeper for food.

Criterion 3. The potential for ongoing development

Strategy elements will vary in terms of their potential for ongoing development. In the case of breeding programmes, for example, the infrastructure put in place to tackle one LDO can probably be adapted at limited cost to tackle future objectives. Conversely, some strategy elements may have little scope for further development.



Criterion 4. The level of risk associated with the strategy element

It is important to assess the risk associated with potential strategy elements as well as their expected outcomes. A very low-risk strategy element is one that can be relied upon to deliver the expected or close to the expected benefits under all foreseeable circumstances. Conversely, a very high-risk strategy element may deliver considerable benefit in favourable circumstances, but deliver no benefit if they are unfavourable. A simple five-point scale of risk (very high, high, moderate, low and very low) should be sufficient to address this criterion. Risks to consider include the following:

- How reliable are the estimates of participation? For example, what is the possibility that the uptake will be twice as rapid or half as rapid?
- Do social, cultural or gender issues exist that may affect the rate of uptake?
- How does the rate of uptake affect the benefit to individual livestock keepers? For example, if a livestock keeper is receiving a service and the uptake is lower than expected, will a higher cost for the livestock keeper or a threat to the continuation of the service result?
- How secure are the funds needed to implement the strategy element?
- What impact would result from a sudden withdrawal of funds by the government or international donors?
- What environmental threats (e.g. drought) might interfere with the success of the strategy element, and how likely are these threats to be realized? The risk to the strategy element increases both with the potential impact of the threat and the likelihood that it will be realized.
- What impact might the threat have on the strategy element and the LDOs? For example, a breed introduced as part of the strategy may prove to be unfit for the production system and thus completely undermine the entire strategy for the period considered.

Criterion 5. The probability of the strategy element being sustained

Consider the probability of the strategy element being maintained over the medium to long term, i.e. do not consider only the start-up phase, when high levels of support and enthusiasm are present, but also take into account subsequent phases, when operations are more routine yet need to be more effective.

Criterion 6. Cost.

Estimating the cost is likely to require expertise beyond that available from the working group itself.



5. Identify and describe opportunities for integration among the strategy components, particularly actions that markedly increase benefits and reduce costs and threats. Such opportunities will often arise from cross-cutting strategy elements in which each element is used for more than one strategy either within or across the primary production systems. For example, a cross-cutting element would arise if one element of the strategy is to set up a recording scheme for cattle and another to set up a scheme for sheep; the infrastructure required for recording can be shared between the two species resulting in a more cost-effective strategy overall. Review the broad costing and capacity needs identified under items (3) and (4) in light of the opportunities for integration.
6. On the basis of the information gathered, decide what strategy should be recommended as a means to meet the LDOs. Seek a technical appraisal of these decisions from those who have provided technical assistance. Reconsider the proposals in light of the appraisal, addressing any weaknesses identified.
7. Summarize the conclusions in a draft report. For each component of the strategy, add a schedule for the start-up and practical indicators (measurable and time bound) for assessing progress.
 - Prepare separate summaries describing the various phases of strategy implementation for each species targeted within each production system targeted. Indicate in the summaries the interdependencies that exist among the phases and components of the LDS for example, whether any components depend on others being in place before they can be implemented.
 - Identify the ways in which the breeding component of the LDS contributes to achieving the LDOs.
8. Contact the relevant stakeholders from the list compiled earlier in the planning process (Section A). Seek assistance from relevant experts in order to determine the modalities of the consultation. Send the report to the stakeholders and ask for comments. Summarize their responses and add them as an annex to the report. Revise the report as appropriate. Review the LDS taking into account the requirements listed in Box 5. Finalize the LDS report and send it to the responsible authorities asking them to agree with and formally accept the LDS.

