



guidelines

DEVELOPING SUSTAINABLE VALUE CHAINS FOR SMALL-SCALE LIVESTOCK PRODUCERS

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SUSTAINABLE VALUE CHAINS
FOR SMALL-SCALE
LIVESTOCK PRODUCERS

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Abbreviations and acronyms

ACGG	African Chicken Genetic Gains
AI	Artificial insemination
AnGR	Animal Genetic Resources
APHIS	Animal and Plant Health Inspection Service
ASF	Animal source food
BDI	Birunga Dairy Industries
CA	Conservation agriculture
CCP	Critical control point
CSA	Climate-smart agriculture
EAFF	East African Farmers' Federation
EMBRAPA	Brazilian Agricultural Research Corporation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GBC	Gender-based constraint
GDP	Gross domestic product
GIS	Geographic Information System
GIZ	German Agency for International Cooperation
GMO	Genetically modified organism
GIZ	German Agency for Technical Cooperation
HACCP	Hazard Analysis Critical Control Point
IBD	Biodynamic Institute
ICT	Information and communications technology
IFAD	International Fund for Agricultural Development
LCA	Life cycle assessment
LIDI	Leather Industry Development Institute
LLPI	Leather and leather products industry
M&E	Monitoring and evaluation
MFI	Microfinance institution
MOU	Memorandum of understanding
NAADS	National Agricultural Advisory Services
OECD	Organisation for Economic Co-operation and Development
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PDO	Protected designation of origin
PPD	Public–private dialogue
PPP	Public–private partnership
PPPP	Public–Private–Producer Partnership
R&D	Research and development
RARP	Rural Agriculture Revitalization Programme
ROSCA	Rotating savings and credit associations
RUDAFCOS	Rubuguri dairy farmers' cooperative society

SACCO	Savings and credit cooperative
SDG	Sustainable Development Goal
SHC	Smallholder chicken
SNV	Netherlands Development Organization
SVFC	Sustainable food value chain
SVFCD	Sustainable food value chain development
SWOT	Strengths, weaknesses, opportunities and threats
UNIDO	United Nations Industrial Development Organization
USDA	United States Department of Agriculture
USP	Unique selling proposition
VC	Value chain
VCA	Value chain analysis
VSF	Veterinarians Without Borders
WWF	World Wide Fund for Nature

Executive summary

In both developing and developed countries, small-scale livestock producers are important actors in food production, human health and management of landscapes and animal genetic resources. However, they face a number of challenges – restricted access to markets and related services, environmental constraints, and limited capacities – all of which hamper their productivity and competitiveness vis-à-vis their larger counterparts. Some issues are specific to livestock and represent important constraints in the development of most livestock value chains.

The sustainable food value chain (SFVC) framework is a market-driven approach developed by the Food and Agriculture Organization of the United Nations (FAO) to provide guidance in development thinking and intervention design. The guidelines provided in the framework represent a practical development tool. They focus on small-scale livestock producers and are intended for a target audience of project design teams, national programme managers and policymakers. The three key objectives considered are to:

- reduce rural poverty in general, with a specific reference to small-scale livestock producers;
- increase the sustainability and resilience of small-scale producers in a changing environment; and
- empower small-scale livestock producers inclusively, in both economic and political terms.

These objectives reflect several of the United Nations' Sustainable Development Goals (SDGs). They are also aligned with the strategic priority area of the Global Plan of Action for Animal Genetic Resources on sustainable use and development.

THE CONCEPT AND CONTEXT

The guidelines adhere to the following definition of livestock-specific food value chains:

The full range of people and organizations and their coordinated value-adding activities, which make it possible to produce and transform livestock products that are sold to final consumers in a manner that is profitable all along the chain, has broad-based benefits for society and shows neutral or positive impacts on natural resources. It fully considers the interaction between its components and the physical, social and economic enabling environment.

The market-led approach of the SFVC framework incorporates both value addition and sustainability. The value added is the difference between non-labour cost of production and the price consumers are willing to pay (adjusted for the positive/negative impact on society and the environment). Value added is shared among different stakeholders and exists in various forms: salaries or wages for employees, net profits for enterprises, tax revenues for the government, and the consumer surplus (the difference between the market price and what the consumers would be willing to pay). Sustainability has various dimensions: economic (it is profitable in all of its stages), social (it has broad-based benefits for society) and environmental (it has a positive or neutral impact on the natural environment). In the context of value chain analysis and development, it is essential to understand interactions between the different stakeholders – their activities, the enabling environment, what drives

their behaviour, what governs the value chain (VC). At the same time, it is important to consider the performance of the value chain in all three dimensions (economic, social, environmental). It thus becomes possible to identify root problems, leverage opportunities to upgrade the targeted value chain, and develop (together with the stakeholders) action plans to support the vision and value chain development strategy.

There is a wide range of livestock systems in the world. Some issues are nevertheless common to all systems and related value chains and affect their sustainability and management. First, livestock often have multiple functions – from production (e.g. food, hides, skins and dung) and services (e.g. draught power, regulating ecosystem services), to savings and social prestige – which may drive the behaviour of small producers. Second, small-scale livestock producers are often involved in a network of different interacting value chains, which must all be considered in the livestock value chain analysis. Third, animal health and food safety represent a specific challenge: animals generally require healthcare to maintain production levels and avoid unwanted losses, and zoonotic animal diseases can potentially be transmitted to humans all along the value chain. Livestock value chains may also involve specific activities and processes, such as fattening or slaughtering animals and refrigerating or processing milk products. Finally, value chains may require a particular focus for certain cross-cutting issues, including: the positive and negative interactions between livestock and their environment, the specific roles of women and children in livestock management, quality along the food chain (e.g. taste, appearance, nutritional properties, safety, food losses), and animal welfare.

PUTTING THE CONCEPT INTO PRACTICE

Value chain development is a dynamic process comprising six steps. Continuous monitoring enables interventions to be adjusted as necessary, as they are scaled up. The guidelines take the user through the steps below, highlighting the particularities of the smallholder livestock sector.

1. Preliminary assessment

The first step in a value chain programme is to understand the wider context in which it is being implemented. What is the programme objective, who has initiated it and why? What is the programme's role in the overall livestock development strategy? How will the programme be implemented (i.e. instruments, beneficiaries, strategic partners, timeline and resources)? Characteristics of the livestock sector are then mapped out in order to determine market opportunities and potential, the demand and supply situation, the subsectors and production systems involved, economic importance and trade, actors present and challenges faced. Based on this preliminary assessment, the objective, scope and parameters of the intervention for the specific value chain can be defined and the strategic partners identified.

2. Value chain selection

The choice of the specific value chain to be analysed within the (sub)sector is based on the specific programme framework, which provides the selection criteria. First, assess the market and its growth opportunities, followed by the importance of the sector and its development impact (e.g. poverty reduction, improved nutrition, employment), together with the feasibility of change and other strategic factors. It is then possible to prioritize the value chains

(based on specific products, channels or markets) and rank them according to criteria that reflect the objectives and scope of the programme. These criteria are grouped as follows: (i) market and growth opportunities; (ii) relevance of the sector and its development impact; and (iii) strategic factors and feasibility of change.

3. Value chain analysis

Value chain analysis allows practitioners to understand the market systems in the value chain, the openings they provide and the market failures that affect competitiveness and sustainable, inclusive growth. First, carry out a comprehensive end-market analysis to understand the market opportunities and dynamics, and to gauge the potential for growth. Second, map the value chain taking into account: the core value chain (including the actors involved in production, aggregation, processing and distribution); the extended value chain and supporting functions (provision of knowledge and skills, research and development services, feed, veterinary and financial services etc.); and the enabling environment (comprising organizations and the formal and informal rules and regulations that govern the way in which business is transacted). Once the value chain is mapped, a set of analytical tools can be used to better understand how the value chain is performing in terms of incentives and capacities, governance and institutional issues, and also with regard to the presence of an enabling environment, the general economic context and sustainability. These tools include: quantitative analyses of the volume of value added, as well as of costs and profit margins across the value chain; food loss evaluations; and life cycle assessments, including environmental footprints. In addition, strategic analyses must be carried out to identify internal strengths and weaknesses of the chain, and the external opportunities and threats that influence its competitive advantage and the potential for sustainable, inclusive growth. The analysis should also capture the dynamics of the value chain, and factors that influence it.

4. Vision and development strategy

Once the value chain analysis is complete, key stakeholders and partners should formulate and agree on a common vision, establishing the objectives to be achieved within a specific time frame. The objectives should be concrete and precise, including specific targets where possible. The stakeholders and partners must then generate a development strategy, considering the reasons why value chain actors and partners do not take advantage of market opportunities (i.e. lack of incentives or lack of capacities). Based on these considerations, the strategy sets out how the value chain programme can help the actors achieve the objectives established in the vision.

5. Design and implementation

The action plan details how the strategy is to be implemented. It breaks the strategy down into its various components – what, how, when, who and where – and includes interventions in the core value chain support markets and enabling environment. Public–private partnerships (PPPs) are expected to be central to value chain development strategy and implementation, and it is very important that the roles, responsibilities and ownerships of all partners are clearly defined prior to implementation.

6. Monitoring, evaluation and scaling up

A monitoring and evaluation system uses outcome and impact indicators to track project steering and measure project effectiveness and impact. Scaling up is necessary – in terms of geographical expansion, institutionalization and strengthening of the project – and should be integrated into the overall development strategy.

Finally, a clear phasing-out strategy ensures that interventions are sustainable and that the system continues to respond and adapt to changing market, social and environmental conditions.

By integrating the concepts of value addition and the three dimensions of sustainability, the SFVC framework not only addresses questions concerning the competitiveness, inclusion and empowerment of small-scale producers, but incorporates the cross-cutting issues that are increasingly embedded in development projects. SFVC is designed to be flexible and should be used together with other tools and approaches aimed at resolving specific transversal issues. However, **livestock specificities must be considered at every stage of a value chain development programme**. SFVC can also be used to complement national development strategies and programmes, potentially assuming a key role in the development of the livestock sector and the reduction in hunger and poverty.

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PART I

Context and concept

Introduction

In many food systems – in both developing and developed countries – small-scale livestock producers are major stakeholders in food production and, consequently, in human health and landscape management. Regardless of the scale, **livestock production is an economic activity**; how producers are connected to the market is, therefore, central to the development of the sector. Market connectivity is all the more important given the growing demand, both current and projected, for livestock products in developing countries.

Improving linkages between small-scale producers and the market is in line with several objectives pursued by FAO, including making agricultural and food systems more inclusive and efficient, increasing the productivity and sustainability of agriculture, reducing rural poverty, and eliminating hunger and malnutrition. These objectives reflect the United Nations' Sustainable Development Goals (SDGs), such as SDG1 (End poverty in all its forms everywhere); SDG2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture); SDG8 (Promote inclusive and sustainable economic growth, employment and decent work for all); SDG12 (Ensure sustainable consumption and production patterns); and SDG17 (Strengthen the means of implementation and revitalize the global partnership for sustainable development).

The Global Plan of Action for Animal Genetic Resources (FAO, 2007) recognizes support for market access in indigenous and local production systems as a priority action in sustainable use and development. Local and locally adapted breeds are often kept by small-scale livestock producers (FAO, 2012a). Past studies have been undertaken to collect cases where actions have been taken to promote products from local breeds and improve the livelihood of their owners (LPP *et al.*, 2010). The development of sustainable value chains for small-scale livestock producers may facilitate the maintenance of their breeds and livestock genetic diversity in general.

These guidelines are intended as a development tool for the design of interventions on a participatory basis and for the development and improvement of value chains (VCs) in a sustainable manner. Three **key objectives** are proposed:

- reduce rural poverty in general, with a specific focus on small-scale livestock producers;
- increase the sustainability and resilience of small-scale producers in a context of environmental and climate change; and
- empower small-scale livestock producers economically and politically, in an inclusive manner.

In contrast to other value chain tools, guidelines and handbooks, the **SFVC focus is on the problems of small-scale livestock producers** within the value chain framework.

These guidelines are intended for policymakers in ministries, national programme managers, project design teams, farmer organizations, and partners interested in value chain development. The ultimate beneficiaries should, however, not only be small-scale producers, but also the different players involved at different stages in the value chains as intermediaries or supporting actors.

Why a sustainable value chain approach?

These guidelines follow the sustainable food value chain development (SFVCD) approach, designed for upgrading a food sector. The SFVCD approach is based on the following principles:

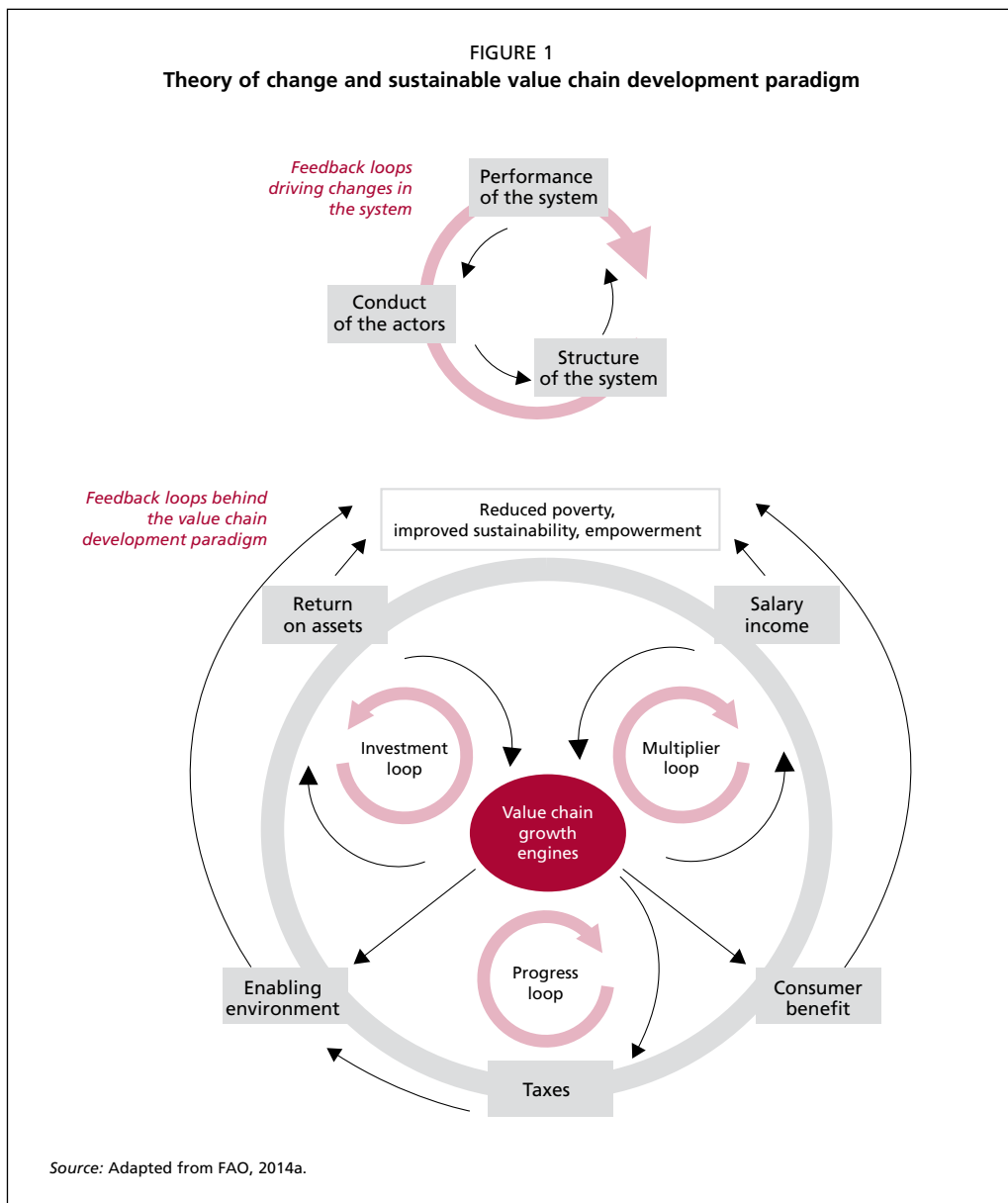
- **Measuring performance.** The three dimensions of sustainability, namely economic, social and environmental, must be considered holistically, including synergies and trade-offs.
- **Understanding performance.** The approach takes a holistic perspective, meaning that the systems considered are interconnected and dynamic, governance-centred, and market-driven.
- **Improving performance.** Translating value chain analysis (VCA) into effective interventions requires a clear vision and upgrading strategy, but the process must also be scalable and multilateral.

To better understand how the SFVCD approach can help achieve the objectives, it is useful to consider the main opportunities and challenges facing small-scale livestock producers.

The livestock sector is expected to grow – in terms of both quantity and quality – in order to meet increasing demand. The SFVCD market-driven approach can help meet this demand and represents a major opportunity for improving the livelihoods of small-scale producers.

However, **small-scale livestock producers face many challenges compared with large-scale producers**: environmental constraints, poor access to markets and related services, and limited capacities can all hamper productivity and competitiveness. For small-scale producers, access to the market is key for securing better livelihoods: in fact, there is often a strong relation between distance to market and poverty incidence among rural populations (FAO, 2012b). In their market dealings, small-scale producers are often handicapped by low-quality inputs (e.g. feed or veterinary drugs), poor services and expertise, high transaction costs, low sanitary standards and limited bargaining power with traders and intermediaries (Markelova *et al.*, 2009; FAO, 2012b). Moreover, lack of organization and governance, or absence of a political framework and appropriate infrastructure can lead to problems linking products to markets (McDermott *et al.*, 2010). Social norms must be taken into account: for example, female livestock producers may face even greater constraints than men given their more limited access to productive resources, technology, information and services. Finally, on the whole, livestock sector development often lacks a dedicated policy framework, due in part to the fact that animal husbandry tends to be considered a secondary component of smallholder agriculture (FAO, 2012b).

The development paradigm and theory of change behind the SFVCD approach recognizes the intricate nature of the food production system: the value chain (including its interlinkages and its environment) generates incentives and capacities; these determine



the conduct of the actors, which in turn affects the performance of the value chains; this performance may influence the structure of the system and the conduct of the actors. In summary, a feedback loop is created. The SFVCD approach aims to reduce rural poverty, enhance sustainability, increase the resilience of small-scale livestock producers, and empower them; to this end, different loops are considered, focusing on investment, multiplier effects, or social and environmental progress (Figure 1). The development of a sustainable value chain is intended to benefit small producers developing their activities as

commercial farmers through a return on assets (investment loop). The sustainable value chain development paradigm also involves, however, the creation of decent job opportunities throughout the chain (multiplier loop). For example, it is likely that the upgrading of production through the use of new inputs and technologies such as feed, drugs or artificial insemination, will require adequate services and involve the creation of new jobs. Finally, as the value chain becomes more sustainable (in economic, environmental and social terms), tax revenues may contribute to the improvement of the enabling environment through the development of public services, such as education, roads and infrastructure, and public extension services benefiting all members of the community (progress loop).

Sustainability is not only considered in economic terms. The other pillars of sustainability – the environmental and social dimensions – are central to the development of the livestock sector. Future increased competition for resources (land, water etc.) may have a major impact on livestock production systems, including those involving small-scale producers (McDermott *et al.*, 2010). Livestock production is likely to be deeply affected by climate change, especially in sub-Saharan Africa and South Asia, which already have some of the highest rates of poverty and food insecurity (Vermeulen, Grainger-Jones and Yao, 2014). For instance, it is expected that the growing season for crops in arid and semi-arid rangelands will diminish by 20 percent in the coming decades (Thornton *et al.*, 2007). Sociocultural changes may affect consumption of livestock products (Thornton, 2010). The volume of livestock products under organic or other quality certification, although still relatively small, has increased substantially in recent years (McMorran *et al.*, 2015; FiBL/IFOAM, 2018). The growing interest in the patrimonial value of livestock (e.g. in specific native breeds) can be used to add value to local products (Gandini and Villa, 2003). Furthermore, there is increased ethical and environmental concern about the use of livestock; while this could lead to diminished consumption of animal products, it could also reward production systems that take animal welfare and other societal concerns into account.

Livestock production systems are characterized by a wide range of considerations (multi-functionality, input and output provision, health and quality, social equity etc.). For this reason, VCA requires a holistic approach, taking into account not only the supply chain itself, but also its wider environment, its dynamics and its connections to other systems. The specific context will condition which analytical tools are adopted – for example, carbon emission appraisal, SWOT (strengths, weaknesses, opportunities and threats) analysis, end-market analysis or value chain mapping.

Livestock markets and small-scale livestock producers

1. SPECIFIC CHARACTERISTICS OF THE LIVESTOCK MARKET

The market is a major driver of livelihoods, and improved market access is a powerful catalyst for poverty alleviation in transition economies (FAO, 2012b). This is especially true for the livestock sector, as growth in demand in developing countries during 2007–2030 is projected at 2.2 percent for meat and 2.1 percent for milk (Alexandratos and Bruinsma, 2012). In those countries, characterized by increasing urbanization and incomes, higher demand for livestock products is expected to be accompanied by increased preference for quality products as average consumer incomes rise (McDermott *et al.*, 2010). In developed countries, while overall consumption has stabilized in recent years, greater demand is projected for more sustainable products (FAO, 2017a).

Livestock markets are characterized by a number of features, some peculiar to livestock in general, others related to specific commodities. At the production level, livestock systems are often characterized by long production runs linked in complex ways to specific physiological cycles or feed availability (Rich *et al.*, 2009); these long production cycles (e.g. 2–5 years for cattle to be ready for slaughter) imply a long and risky investment for the producer. Livestock marketing is an important component of small-scale producers' risk-management strategies and in some cases is driven more by income needs than by price movements, meaning that producers' price elasticity is low. The two main forms of commercialization are live animals and various livestock products (mostly meat and milk): in 2016, live animals represented around 10 percent of the value of animal product exports at the global level and 52 percent in West Africa (ITC, 2017). This raises various challenges during transport: storage and refrigeration in the case of livestock products; management of feed and zoonotic diseases in the case of live animals. Livestock marketing chains can be long, in terms of distance and the number of traders involved. Transaction and processing modalities vary (depending on the final product); they involve a variety of employment-creating services and inputs, as well as potential transaction costs (Rich *et al.*, 2009). At the end of the supply chain, livestock products are purchased in a number of outlets and in different retail forms (World Bank, 2014). These specificities need to be carefully considered as they may involve numerous market failures, high transaction costs, price volatility, information asymmetries, lack of organization capacity, regulatory failures and unbalanced market power (Rich *et al.*, 2009).

Animal products are an important source of protein, providing a wealth of micronutrients and playing a key role in human nutrition and health. Compared with crops, livestock are usually more expensive, and increased consumption of animal source food (ASF) is therefore tightly linked to income growth. Consumption of ASF is also strongly related to sociocultural attitudes. Growing ethical concern about animal welfare and the environment

is expected to affect consumption in developed countries (Thornton, 2010), while religious aspects (restrictions, festivals etc.) can strongly affect general or seasonal demand for specific commodities.

The livestock market must take into account quality in all its aspects (taste, health and safety, service). Sanitary quality is of particular importance since livestock products are highly perishable products, which can be processed in different manners according to products, technology available and cultural factors. Poor-quality ASF can have a detrimental effect on human health; product evaluation affects the service provided. Matters related to proper storage and/or biosafety standards should therefore be taken into account. Sociocultural factors influence taste, which varies according to time and place.

Finally, it is important to consider the livestock market on various scales (local, national, international). In developing countries, the informal sector (i.e. sector of the market not covered or insufficiently covered by formal arrangements) may account for a large share of the local market. On the other hand, it should be underlined that international trade in live animals and animal products is expanding: from 4 percent in volume terms in the 1980s to 12 percent in 2013 (Guyomard, Manceron and Peyraud, 2013). Pitted against developed and emerging economies such as Brazil or India, most developing country producers face competitive disadvantages both at home and abroad (FAO, 2012b). Their limited capacities and/or higher unit costs, together with their difficulties in meeting high sanitary standards, may prevent them not only from capturing the benefits of growing domestic demand but also from moving into export markets. This holds especially true for small-scale operators.

2. WHO ARE SMALL-SCALE LIVESTOCK PRODUCERS?

It is not easy to generally define who the world's small-scale livestock producers are. Various factors must be considered, such as size (land area or livestock numbers), family dynamics, poverty, productivity, production systems and decision-making processes (FAO, 2013a). While these aspects tend to be interconnected, they differ across countries, production systems and agro-ecological zones (FAO, 2017b). For the purpose of these guidelines, small-scale producers are broadly defined as livestock farmers with limited resource endowments relative to others in the sector. Pastoralists, for example, are considered to be small-scale livestock producers even if they have large herds, since their sustainability is constrained by limited resources.

In the context of value chains, small-scale livestock producers vary in terms of species raised, commodities produced, production systems operated and capacities possessed. In particular, species are a major factor of differentiation. The choice of species is highly dependent on the local environment. Some species, such as camelids and yaks, are specifically adapted to extreme conditions. Ruminants are more closely associated with the local environment than are monogastric species like pigs and chickens, which can be housed and kept largely detached from the environment. Species may also reflect sociocultural beliefs (e.g. religious restrictions) and, finally, they determine which goods are produced (meat, milk, eggs, hides, dung etc.).

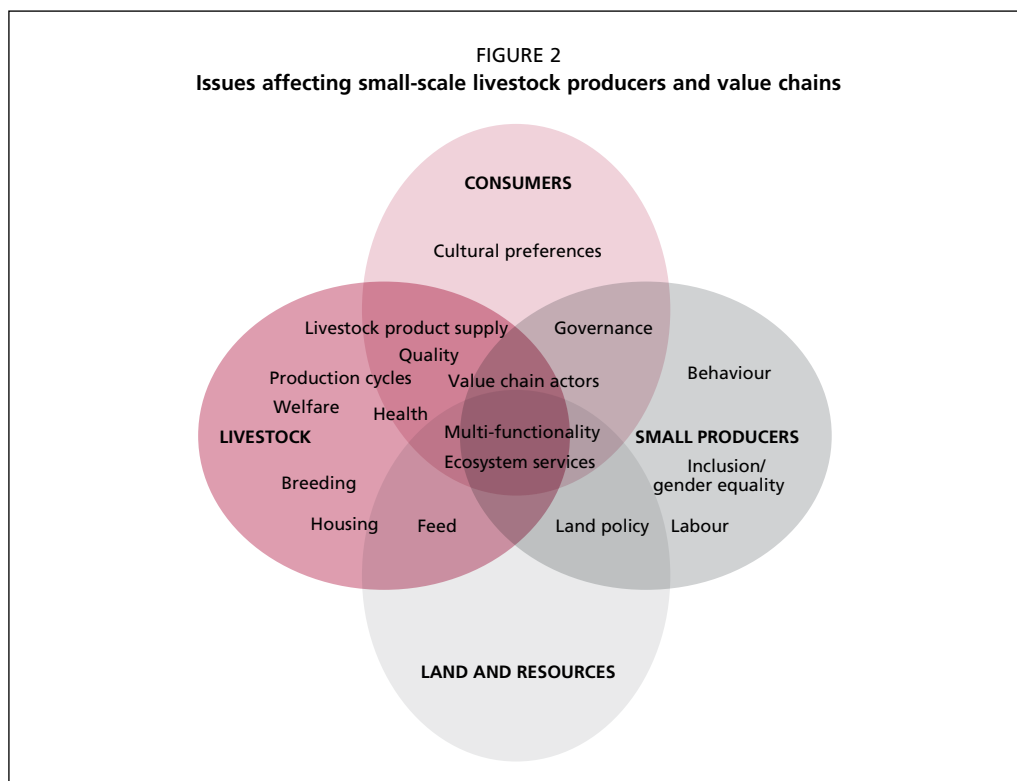
The organization of the value chain depends on the product type (transportability, value and sanitary requirements) and the customer (who buys it). It is necessary to consider product aggregation, transformation (including slaughter) and distribution. The complexity of a value chain can therefore vary from direct sale (from producer to consumer, often through informal markets) to multiple-step chains (involving many intermediaries and targeting

international markets). In developing countries the informal sector may account for a large share of the consumption. For instance, in Kenya and Ethiopia up to 70 percent of milk marketed is sold through the informal market (Staal, Nin Pratt and Jabbar, 2008).

Livestock keepers also differ according to production system: pastoral or mixed/backyard (Gerber *et al.*, 2013). While pastoralists rely solely on livestock products for their livelihood, in backyard (mostly chickens and pigs) and mixed crop–livestock (often ruminants) systems, livestock’s contribution to household income may be secondary compared with the importance of livestock in terms of household food security, savings, re-use of residues, draught power and dung production (see Box 1). Indeed, the rationale for keeping livestock is not necessarily related to market price. For instance, the decision to sell small livestock may depend on the immediate need to pay annual school fees rather than on market prices. Even though livestock may provide a significant proportion of household income in mixed/backyard systems, value added to livestock products is often strongly linked to other activities and should not be considered independently. It is important to ascertain whether livestock keepers have a reason for interacting with the market before implementing a value chain approach.

3. COMMON ISSUES RELATED TO LIVESTOCK AND ASSOCIATED VALUE CHAINS

Despite their many differences, most – if not all – of the world’s small-scale livestock producers face a number of common issues (Figure 2). These may, in varying degrees, affect the sustainability of farming systems and related value chains.

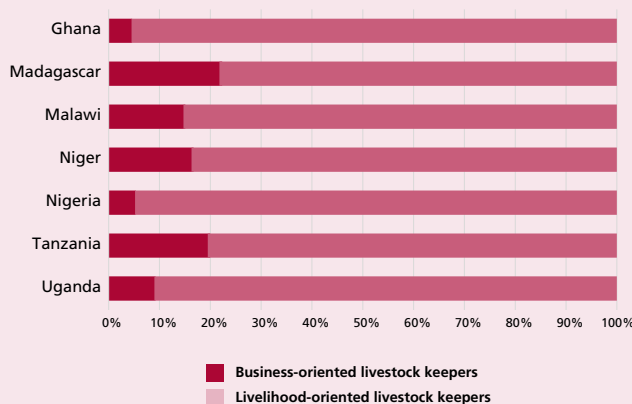


BOX 1

Livelihood- and business-oriented livestock keepers

Given the diversity of livestock small-scale producers, it is unlikely that all households would be willing or able to upgrade their activities. It can be assumed that farmers who make scarce profits from livestock have little incentive to change their practices. A high return on investment will be of no interest if its absolute value is low from a livelihood perspective (which takes account of all the various benefits provided by livestock). But it has also been suggested that livestock keepers, although obtaining numerous goods and services from their animals, are also likely to step out of livestock as soon as an alternative, such as wage employment, appears.

A survey of several African countries has revealed wide variations in income from livestock as a share of total household revenue, ranging from 9 to 22 percent depending on the country. It has therefore been proposed that households earning less than 25 percent of their income from livestock products should be defined as **livelihood-oriented livestock keepers**, and that those above this threshold should be termed **business-oriented livestock keepers**. This second category, which accounts for between 5 and 21 percent of livestock-keeping households – depending on the country surveyed – is more likely to change its practices to take advantage of the growing demand for livestock products. It is also the category more likely to benefit from, and participate in, livestock value chain projects. The 25 percent threshold, it should be noted, is merely indicative, and should be viewed in the local context, considering the specific aims of a given project and its potential benefits, whether monetary or not, to livestock keepers. Also, some value chain projects may aim precisely at helping livestock keepers to switch from a livelihood to a business approach. It is nevertheless important to carefully assess what incentives (economic and non-) may decide small-scale producers to change their behaviour.



Source: World Bank, 2014.

In terms of livestock production, it is important to remember that domestic animals continuously require inputs (food, water etc.) and produce outputs (milk, dung etc.). Small-scale producers are highly dependent on local or external **feed resources**, and in some cases feed provision can constitute a separate value chain, with its own implications in terms of workload, livestock products supply, organization and interaction with intermediaries.

Another potential issue for consideration is **breeding**, as the use of breeding stock involves management of genetic resources. However, its relevance depends on the production system involved. Some small-scale producers do not have specific breeding practices, while others rely on genetic improvement through artificial insemination (AI) or stud animals. In any case, small-scale livestock producers have a fundamental role in the development, use and conservation of animal genetic resources for food and agriculture (FAO, 2013a).

While some smallholder production systems can be considered landless, or backyard, operations, all farmers (indirectly in the case of landless ones) rely on **land and related resources** such as water, either for pasture or for feed. This issue is of particular concern to pastoralists, whose livelihoods depend on the mobility of animals. This has consequences in terms of land tenure and access to markets and services.

Small-scale livestock production systems are characterized by **multi-functionality** – a key component of resilience. In the context of value chain intervention, any interference of an action with other livestock functions must be carefully weighted. For example, livestock that are kept to ensure a farmer's subsistence also serve as a form of savings to meet specific expenses (in both the short and the long term). Therefore, if the farmer switches to a different business model and changes his/her behaviour accordingly, he/she will also need to find alternative forms of financing (see Box 1).

The **seasonal** nature of livestock production and consumption is another important consideration. At any given time, the current share of production does not necessarily provide a complete picture of the value chain (Kaplinsky and Morris, 2001). Milk production and fattening performance varies with fodder availability. For example, in Muslim countries, religious festivals featuring animal sacrifice have a direct impact on value chains, as they are accompanied by sudden and brief increases in demand for meat or live animals for sale to consumers (Strasser, Dannenberg and Kulke, 2013).

All livestock value chains must deal with **animal health**. Veterinary care is generally required to maintain production levels, prevent losses and avoid transmission of animal diseases to humans (a real phenomenon in recent decades, sometimes on a global scale). Marketing chains provide multiple opportunities for the transmission of pathogens, starting with contact between domestic and wild animals at one end of the chain, and ending with the consumption of contaminated animal products at the other (FAO, 2011a).

The **quality** of the food throughout the chain has many different aspects, including taste and texture, nutrition, purity, safety and hygiene, food losses etc. Each aspect has consequences up and down the livestock chain: the fattening, transport and slaughter of live animals, and the transformation, transport and conservation of animal products all impact strongly on quality (Strasser, Dannenberg and Kulke 2005). In developing countries, for example, a reduction in food losses in the chain could have a major impact on small-scale producers' livelihoods (FAO, 2011b). In order to ensure quality, livestock products may

require specific processing facilities and infrastructure (abattoirs, milk tanks, dairy plants, tanneries etc.); such facilities may be crucial value chain components and might involve actors essential for the governance of the livestock chains.

Of increasing concern is **animal welfare**, especially in developed countries, where it often influences consumer choice and prompts public debate on standards and labelling. It is important to also consider the **cultural importance** of livestock ecosystem services.

Finally, **women, children and specific ethnic groups** may have different roles and responsibilities. It is important to analyse the parts played by women and men, children and young people in the different nodes of the chain. This allows the understanding of how the various actors participate in the chain: How do they benefit? What is their access to and control over resources and services? To what extent are they involved in decision-making? Identifying gender inequalities helps projects and programmes address these issues, enhancing the sustainability and inclusiveness of a livestock value chain while improving its performance.

On the other hand, **many factors differentiate small-scale producers** in terms of social determinants (gender, age, education etc.), local conditions (climate, infrastructure etc.) and the general regulatory framework (legal, farmers' organization etc.). For example, in Viet Nam, distance to market impacts the organization of pig farming systems (Herold *et al.*, 2010). Furthermore, the sociocultural role of the various livestock species may differ depending on the country and society. In some places, women are traditionally in charge of raising livestock (poultry, small ruminants and dairy farming) with the support of young family members. This can represent both a challenge and an opportunity for empowerment, since women and young people often have limited access to resources, information and services, and are less involved in decision-making than men (FAO, 2011c).

The sustainable value chain framework

1. DEFINITIONS

The definition of value chain supplied by Kaplinsky and Morris (2001) was adapted to the specific field of food products by FAO (2014a), which provided the following definition of a sustainable food value chain (SFVC):

The full range of farms and firms and their successive coordinated value-adding activities that produce particular raw agricultural materials and transform them into particular food products that are sold to final consumers and disposed of after use, in a manner that is profitable throughout, has broad-based benefits for society and does not permanently deplete natural resources.

In these guidelines, the scope is limited to livestock, specifically targeting small-scale producers. The appropriate definition of a livestock-specific food value chain could therefore be:

The full range of people and organizations and their coordinated value-adding activities that produce and transform livestock products that are sold to final consumers in a manner that is profitable throughout, has broad-based benefits for society and shows neutral or positive impacts on natural resources. It fully considers the interaction between its components, and the physical, social, and economic enabling environment.

The people and organizations associated with value chains conduct a series of **core activities** (where they have ownership of the product): production, collection/aggregation, processing and distribution (both wholesale and retail). These activities depend on the species considered, the final product, and market channels (i.e. pathways through which the product moves from the producer to the end user), as well as technological and socio-cultural specificities. They are completed by **extended services** (which support or constrain the flow of products): marketing, inspection and training, for example. It is essential to understand the relationships between the actors (people, organizations, institutions) that operate in, influence or enforce the value chain in order to be able to measure, understand and improve value chain performance. Indeed, SFVC development involves understanding the behaviour of actors in order to guide them towards better coordination and sustainability, and it is therefore important to consider all types and levels of coordination mechanisms (formal contractual agreements, sociocultural norms etc.).

The **SFVC framework is market-driven** in the broad sense: it seeks potential ways to upgrade markets and value chains, identifying critical issues and detecting potential market failures to overcome.

Value added is central to the concept of value chains, because the activities carried out by broadly coordinated value chain actors generate value. Indeed, the main objective of value chains is to efficiently capture value generated at the end-market in order to engender profits and outcomes for all stakeholders involved, from production to consumption. A value

chain analysis must consider the total distribution of the value added, taking into account: social and environmental impacts; minority and gender aspects (since gender equity and economic growth can be mutually reinforcing, while, conversely, gender inequalities tend to increase costs and inefficiencies along the chain); and negative and positive externalities (e.g. environmental footprint, risks of disease and compromised food safety).

The SFVC framework takes **account of the economic, social and environmental sustainability** of a value chain. SFVCs need to be profitable all along the chain, offer broad-based benefits to society and have a positive (or neutral) impact on the environment. In the context of a project, it is therefore necessary to integrate the multidimensional concepts of sustainability into: the strategic design and implementation of interventions; the evaluation and measurement of value chain performance; and the monitoring, follow-up and exit strategies. It is important to consider eventual trade-offs between the various aspects involved, while bearing in mind that they can be a source of value creation (e.g. marketing actions based on the ecosystem services provided to differentiate a product in the market).

The **enabling environment** is an important consideration. It must encompass many aspects (economic, legal, sociocultural, logistic and ethical) on different scales (local, regional, national and global) and incorporate interactions deriving from the multi-functionality of livestock. As discussed by Webber and Labaste (2010), value chains comprise vertical as well as horizontal linkages to other value chains providing intermediate goods and services. A value chain is often part of a complex network of diverse value chains relating to the wide range of different products provided to small-scale producers. These value chains must be taken into account in the SFVC framework.

Many practitioners view value chains from a development perspective – in terms of market systems, inclusive business models, localized agrifood systems etc. (FAO, 2014a). However, the SFVC framework can be embedded within the broad concept of a food system, comprising all processes and infrastructures required to feed a population, and therefore including all food value chains affecting a selected set of food markets (e.g. the value chains in a given country).

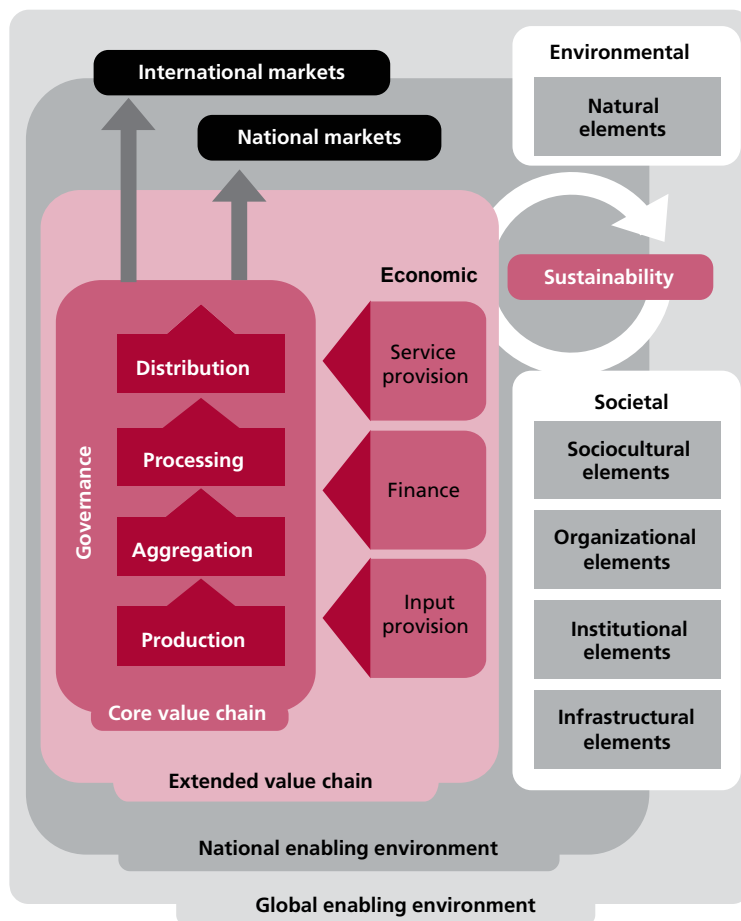
2. THE VALUE CHAIN AND ITS ENVIRONMENT

If we focus on the range of activities involved in bringing a product from producer to consumer, a value chain can be shaped as in Figure 3.

At each step of the process, different functions are handled by various stakeholders. Given the focus on small-scale producers, it is important to consider the interactions (information, governance) between production and the other functions (aggregation, processing, distribution etc.) of the value chain.

Service and input providers are important stakeholders in most livestock value chains, given the dependency of livestock producers on inputs such as feed, drugs or reproductive materials. However, inputs and services are also required at every step in the value chain. This gives input and service providers a key role in chains that support the value-creation process. If, at some stage, input and service providers become owners of the intermediate product, they become integrated in the core value chain. Provision of inputs and services can therefore be considered either as part of the core value chain or as support services.

FIGURE 3
SFVC analytical framework



Source: FAO, 2014a.

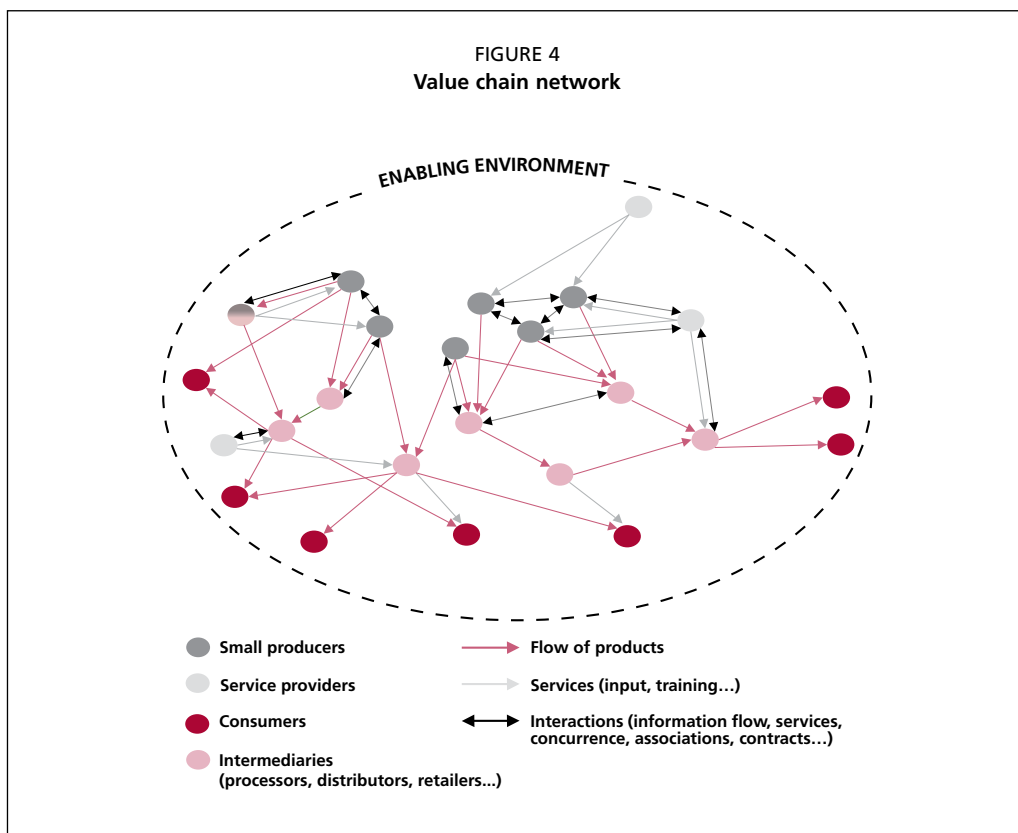
The enabling environment, at national and global level, is an important consideration in the SFVC framework. First, because small-scale livestock producers are often largely dependent on their physical environment, especially pastoralists, whose relation to land is fundamental. Second, because distance from producer to consumer, as well as the existence (or absence) of logistics infrastructure (roads, markets, trains etc.), has a major impact on a value chain, in terms of both intermediate actions required (aggregation, type of processing, and distribution) and value added. Finally, the enabling environment also involves other aspects, such as national legislation, policies and programmes, as well as organizational or socio-cultural considerations that are essential for understanding the value chain and its performance.

3. VALUE CHAIN NETWORKS AND GOVERNANCE

Given the multi-functionality of livestock, small-scale producers may be involved in different value chains, resulting from diversification of markets (e.g. development of various short supply chains targeting different groups of consumers) or diversification of commodities (e.g. meat/milk or crop/livestock). A dairy cattle producer can potentially sell milk, meat and manure: that is at least one value chain per product and multiple potential marketing channels.

A stakeholder may have a range of roles (Figure 4), maintaining complex relationships with other actors. For example, one stakeholder may collect live animals and supply veterinary drugs at the same time; or some producers may also sell reproducing animals. For this reason, an analysis of governance and intervention design must take into account existing interactions between stakeholders, as well as the drivers that bring people and organizations into a specific value chain. Relationships and the rules that govern them need to be assessed to understand the behaviour of actors, and to determine how such behaviour might result in inefficiencies and what incentives can be offered to change that behaviour.

For instance, in the Neuquén province of Argentina, “Criancero” herders of Criollo goat sell some of their kids to local traders, most of whom used to be (or still are) Crianceros themselves. Those traders have a relation of trust with herders, providing them also with food, information, medicine and other items (LPP *et al.*, 2010).



Considering all elements of a value chain network is a very complex task. It is therefore recommended to select only the most significant value chain(s) for a specific objective (IFAD, 2016a). Nevertheless, it is important to consider the different linkages (horizontal and vertical) within the network, because any change within a given chain can have an impact on other value chains (e.g. on producer revenues and activities).

Given the complexity of value chain development, it is often approached on a “one-chain-at-a-time” basis. A proper analysis thus requires first taking a broad look at all the value chains involving small-scale producers, and then carefully selecting the particular value chain that deserves to be prioritized for development and improvement, considering criteria such as market potential and sustainability.

4. VALUE ADDED

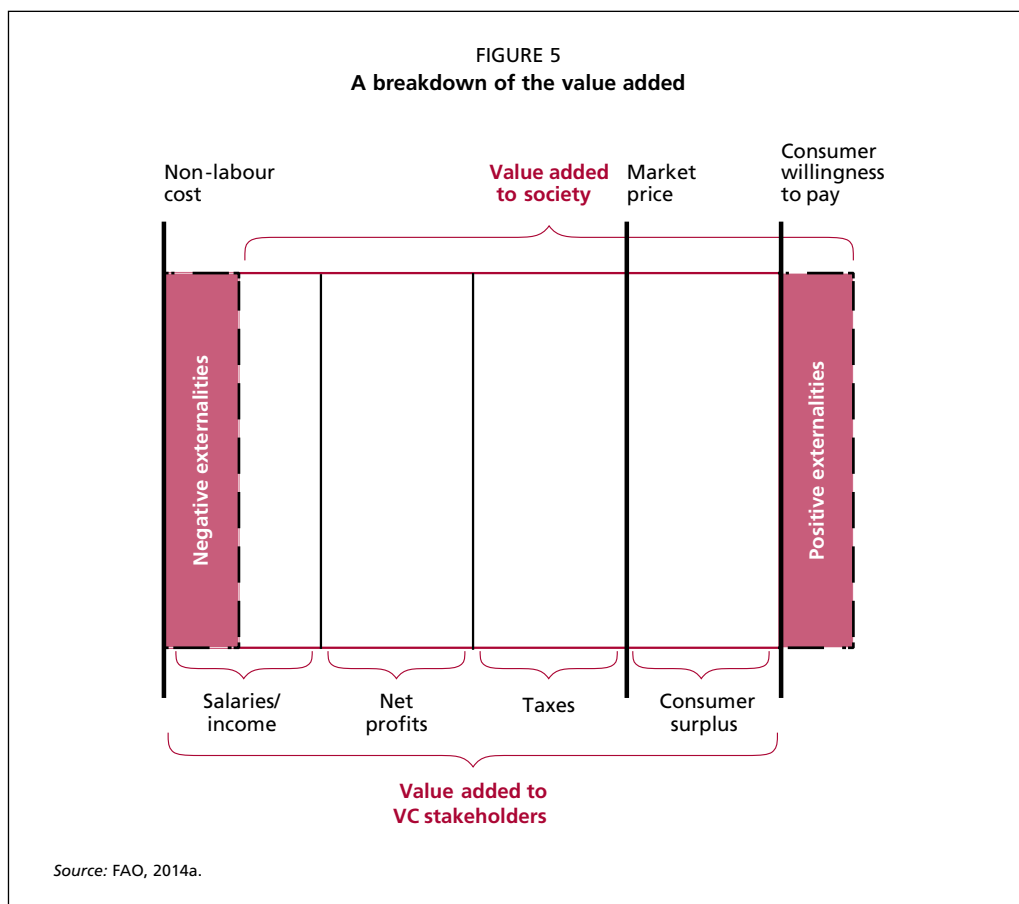
Value addition is central to the value chain approach. From producer to consumer, the product is intended to take on value during processing, storing and transporting. For value chain stakeholders, the value added is defined as the difference between the non-labour costs of producing the product and the consumer’s willingness to pay for it, adjusted for externalities (FAO, 2014a).

The value added depicted in Figure 5 illustrates how the value created is shared between different stakeholders: salaries or income for employees, net profits for enterprises, tax revenues for the government and consumer surplus (i.e. the difference between the market price and what consumers are willing to pay for the product). The economic sustainability of the value chain is expressed in terms of this creation of value. The social sustainability depends on how this value is shared among stakeholders and on it not generating unacceptable outcomes for society (e.g. animal mistreatment). Finally, the environmental sustainability is influenced by both negative (e.g. pollution) and positive (e.g. ecosystem services) externalities.

Development of SFVC and adequate distribution of value added should benefit small-scale producers who decide to become commercial farmers by giving them a return on their assets. But, as noted, it is unlikely that the majority of small-scale producers will do so. It can be expected, however, that as productivity increases, less labour will be required for the same amount of food produced. And since a minority (perhaps 30 percent) of small-scale producers are likely to become entrepreneurs, many smallholders will have to find jobs outside farming (FAO, 2014a; IFAD, 2016a). But the sustainable value chain development paradigm involves the creation of decent job opportunities throughout the chain (e.g. supplying inputs or working downstream in the food value chain). It is likely that upgrading production with new inputs and technologies will necessitate associated services, thus creating new employment along the value chain. Novel technologies and systems may result in the exclusion of some people from the chain, particularly women smallholders. For this reason, **it is important to address educational disparities, risk aversion, social norms and time constraints in order to ensure that new technologies are made accessible to small-scale women producers.**

5. SUSTAINABILITY OF THE VALUE CHAIN

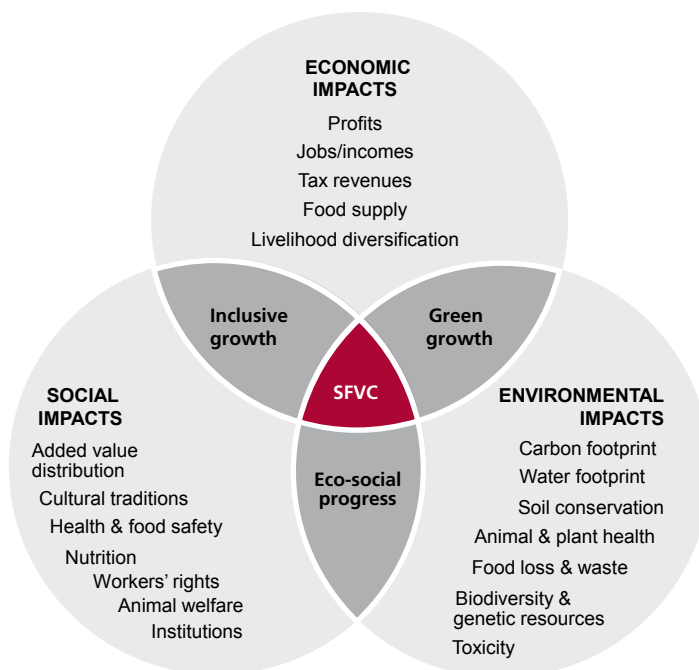
As any change in a value chain can be expected to have an impact at various levels, it is important to consider the three dimensions of sustainability (economic, social and environmental) (Figure 6).



The creation of added value throughout a value chain should ensure its **economic sustainability**. However, it is important to note the following:

- Stakeholders involved in value chain improvement need to have reason – financial or other – to change their behaviour and act as suggested. In other words, the value added must be positive for all stakeholders (not only small-scale producers) whose behaviour needs to change in the value chain development or improvement process. Other changes that may affect stakeholders, such as work burden, should also be considered. This holds true for women smallholders targeted by these guidelines. In general, all possible incentives should be considered, since a successful outcome depends on the motivation of the different stakeholders.
- Value chain sustainability depends largely on resilience and the capacity to react to economic and environmental changes. The capacity of the value chain to adapt and grow in the long term should therefore feature in the value chain assessment.
- Livestock production is about more than the regular income it provides. As previously underlined, animal husbandry is normally embedded in a livelihood diversification strategy. Animals are sold to respond to specific needs either on a regular basis (seed

FIGURE 6
The three dimensions of sustainability in food value chain development



Source: Adapted from FAO, 2014a.

purchase, annual school fees) or for special purposes (dowry, incidents requiring immediate cash); they are bought depending on the availability of cash.

In order to achieve **social sustainability**, it is essential to include small-scale producers in the value chain. Inclusion in or exclusion from agricultural development depends on how producers benefit from their economic activities – regardless of sex, ethnicity, religion or age – and it is unlikely that all small-scale producers can benefit from value chain development. Nevertheless, SFVCD should aim to encompass the largest possible proportion of smallholders with the widest possible diversity. It is important to note the following:

- Given the importance of women and young people in livestock production, gender and social disparities (e.g. age, ethnicity, income and education) should be fully considered in value chain development projects, including at household and individual levels.
- The creation of decent jobs should not be limited to the farm level: jobs must be created along the value chain because they represent opportunities for small-scale producers who are unable to upgrade their activities.
- Capacity-building activities in value chain projects can offer education, mobility and networking opportunities to smallholders, thus helping them find non-farm jobs.

Finally, **environmental sustainability** must be addressed in value chain development. Specific aspects to be considered include the following:

- What is impacted (soil, water, air, biodiversity etc.)?
- Are those impacts positive or negative?
- What is the scale (local, regional, global)?
- Do any impacts affect the value chain itself and how? Rapid soil degradation, for example, can have negative consequences on grazing, while landscape management can lead to more local products being consumed through tourism.

Furthermore, **product quality** is key to ensuring the sustainability of value chains. Newly developed value chains should offer consumers a choice of food products that is more diverse, more nutritious and safer. Food safety is an especially important issue when considering livestock products, in terms of both product processing and conservation, and animal disease risks.

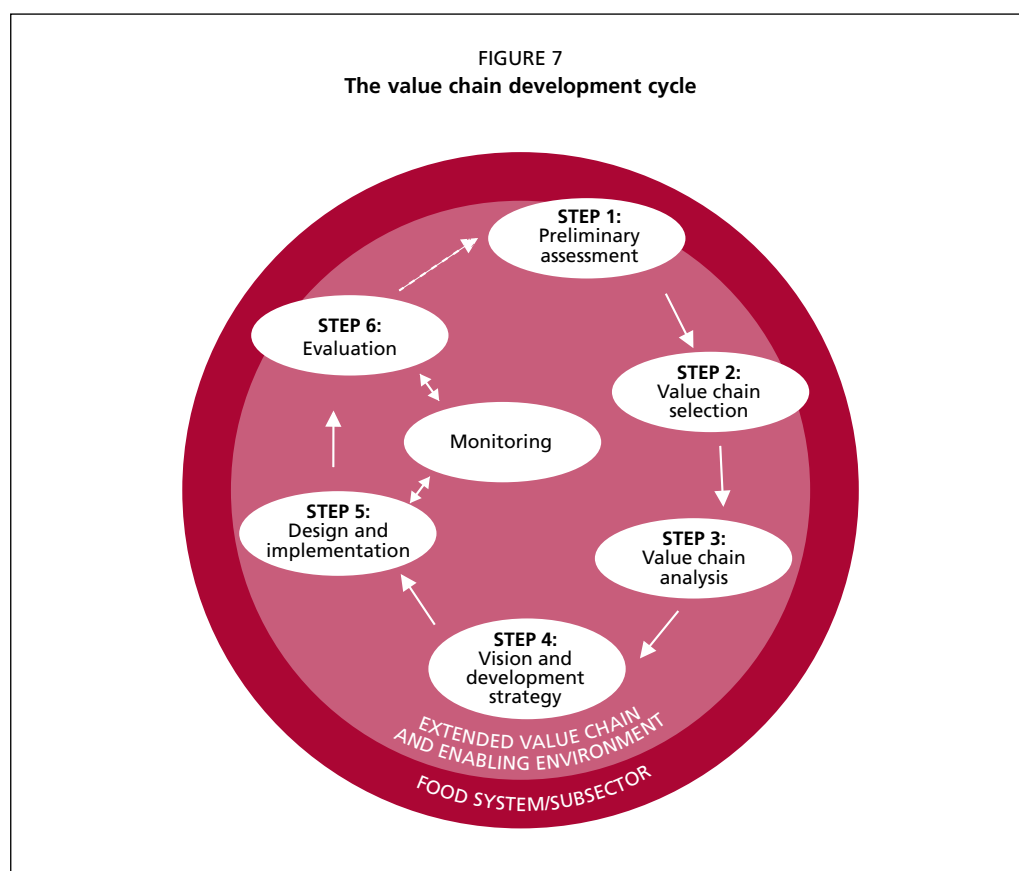
Accounting for the different aspects and level of sustainability is no simple task. Measuring the non-economic values of sustainability can be complex; moreover, trade-offs may occur as improvement in one component of the value chain can have negative consequences in other components. For instance, Magnani, Ancy and Hubert (2019) illustrated that the intensification and pastoralist sedentarization processes implemented in the Sahel region to stabilize and increase milk production, had multiple drawbacks in terms of agro-ecosystems degradation and management of climatic uncertainty.

The steps in value chain analysis and development

Value chain development is a cycle comprising several steps (see Figure 7). Part II of the guidelines describes six steps, highlights specificities and provides examples from the small-scale livestock sector.

Preliminary assessment. An initial assessment of the food system/(sub)sector is made in relation to the context of the programme (species/commodities, beneficiaries and instruments, strategic partners, time and resources etc.).

Value chain selection. Value chains of interest are prioritized on the basis of inefficiencies identified, relevance, and potential for change and impact through well-designed intervention. One or more value chain of interest is then selected.



Value chain analysis. The selected value chain is characterized and mapped, based on the predefined objectives and scope of intervention. The process involves several elements: defining the value chain's overall size; identifying the pathways from source to end-market(s); measuring how costs rise as the product moves along the value chain and how product value increases; considering the market chain's previous and potential development over time; identifying the value chain's comparative advantage and areas of potential growth for sales or profitability. The value chain analysis (VCA) seeks to better understand the value chain's governance, its economic, social and environmental sustainability, and the incentives and capacities of value chain actors. A variety of different economic and non-economic tools, including from the livestock sector, can be used according to the scope of the analysis and the data available. A diagnosis should be made of the root problems, leverage points and opportunities for upgrading the targeted value chain.

Vision and development strategy. In collaboration with value chain actors, a vision and development strategy is developed, including the formulation of an action plan that attributes clear responsibilities to actors and partners for the implementation of the interventions.

Design and implementation. It is important to sequence actions in a comprehensive way in order to build on capacity and address any constraints in a logical manner. Moreover, project design needs to be flexible in order to adapt to eventual changes in the project.

Monitoring and evaluation. A system of monitoring and evaluation (M&E) is essential for tracking the performance and effectiveness of the actions implemented. The information obtained through monitoring allows accountability and – crucially – enables adaptation of the project as necessary. The evaluation stage considers the potential for scaling up – not only replication of the value chain across a wider geographical area, but also in terms of institutionalization involving new partners or policies. It is important to publicize the viability of interventions, showing where they are desirable and to what extent they can be applied in a different context. Evaluation entails gauging the sustainability of interventions (once initial project facilitations are no longer available) and identifying new issues or opportunities for further projects.

Potential and limitations

Prior to the implementation of VCA, certain considerations must be made. The focus of a VCA is on the following:

- Activities – mapping and segmentation of the different activities involved in adding value to a particular raw material.
- Stakeholders – the different stakeholders concerned and their interactions.
- Consequences – in terms of value added and governance.

However, a VCA presents **limitations**. First of all, the emphasis is traditionally on economic efficiency and financial aspects. In contrast, the SFVC framework incorporates other social and environment features, which may be difficult to measure. Further, a VCA tends to pay little attention to the household level, where women and men have different roles, powers of decision and responsibilities. This can result in an individual not participating in the value chain or not receiving potential benefits.

In addition, value chain development is a long-term process. Significant amounts of time are required to carry out all the steps in the cycle. Moreover, the complexity of VCA makes it difficult to assess several value chains at once. Given that small-scale producers may be involved in multiple value chains, focusing on a specific value chain can be restricting. Indeed, if the number of value chains and the synergies between them are too great, VCA might not be the right approach. It may be preferable to consider other options to better integrate different productions and stakeholders within a given territory, such as Localized Agrifood Systems (Arfini *et al.*, 2012).

In any case, it is important to understand that SFVC can be adapted to specific situations, also in combination with other tools (see Box 2 on p. 26 and Annex 2). Value chains are composed of various market systems for the production of particular commodities or groups of related commodities. The value chain approach is an analytical framework for understanding these systems, the opportunities they offer and the market failures that affect competitiveness and sustainable inclusive growth. The diagnosis can then be shared and validated together with value chain actors, service operators and strategic partners in order to design upgrading strategies.

BOX 2

The toolbox

These guidelines suggest various tools for understanding the different dimensions and areas of focus within a value chain:

- **General** tools examine the selection, mapping and sustainability elements of the analysis.
- **Quantitative** tools look at the quantification of the value chain and the analysis of costs, revenues, profit margins and value added distribution along the chain.
- **Qualitative** tools look at strategic factors, incentives and capacities, governance and market system analysis.

Users are not expected to follow these guidelines in a linear manner, or to use all the tools. Depending on the focus of the analysis (see Part II under Programme objective and context) and on the time and resources available, users can adopt a combination of tools – some tools more than others.

While SFVCD is the central approach, it can be combined with related concepts and approaches. For example, when operating across multiple value chains in one or more geographical area, the value chain approach can be combined with regional or local economic development tools, so that the overall competitiveness of a specific region (i.e. ease of doing business, infrastructure etc.) contributes to the competitiveness of the value chain. Similarly, the landscape approach – concerned with the management of production systems and natural resource management – seeks to simultaneously increase productivity, improve livelihoods and protect ecosystems in value chains.

Users should note that the value chain approach is not a silver bullet: negative externalities, trade-offs and inefficiencies will occur and need to be addressed through comprehensive national programmes and development strategies.

Annex 2 provides some guidance as to which tools to use, depending on which dimensions are to be addressed.

Source: Springer-Heinze, 2018.

PART II

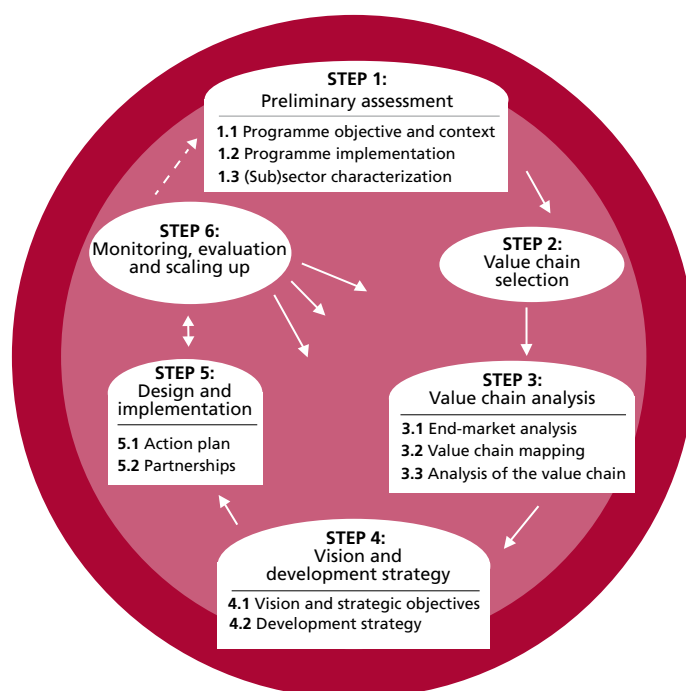
Putting the concept into practice

Introduction

Part II provides users with **practical advice on applying the value chain concept to the livestock sector**. The value chain approach, based on the FAO sustainable food value chain (SFVC) framework, is applied to the specific situations found in the livestock sector and in small-scale animal husbandry.

Value chain diagnosis and upgrading can be compared to a project cycle (see Figure 8). The sequencing of the six steps is important: the VCA and development plan is end-market driven. However, the process is dynamic rather than linear. The upgrading process is continuously monitored and managed to allow for adjustments (e.g. tapping into new channels if the market situation changes) and capacity reassessment (e.g. working with private veterinary drug suppliers if the financial resources of small-scale producers increase). The collection and processing of data becomes a cross-cutting activity to be conducted at

FIGURE 8
The detailed value chain livestock development cycle



all stages of the process. Some steps may include additional elements which can be used according to the focus of the programme.

For each step, information on usable tools and suggestions regarding actors who should be involved, as well as relevant examples and case studies are provided.

Step 1. Preliminary assessment

A value chain is driven by the market and influenced by the context in which it operates. As noted, the value chain is defined as the full range of activities that bring the product (e.g. meat, milk, eggs and live animals) to the end-consumer, passing through various steps of value addition from production and aggregation to processing and distribution. The end-market drives the entire value chain, with market-focused collaboration between various actors. However, the value chain can be divided into a set of multiple markets along the chain, with actors buying and selling intermediary products and services. A first step in the value chain approach is to **understand the wider context** in which it takes place.

Who should get involved?

Only key programme partners (e.g. ministry officials), other strategic stakeholders (e.g. ministry and development partners, value chain actors or organization at the origin of the initiative) and resource persons/experts with a broad view of the global context should be involved in the preliminary assessment. If specific groups are targeted, key local partners and opinion leaders may be interviewed.

1.1 PROGRAMME OBJECTIVE AND CONTEXT

Value chain development initiatives are part of a larger development context, such as a donor-implemented development programme, a national government initiative or a public–private partnership. This section frames the **starting point and overall programme strategy** within which the initiative should take place.

Programme objective

The objective of the overall programme determines the selection, analysis and development strategies of the livestock value chain and gives it direction and purpose. Factors to be considered include the programme's scope (target groups, levels of intervention etc.), focus (geographical and thematic), approach and *modus operandi*.

For example, a programme implemented by a development partner in northwest Kenya has as its objective the improvement of the livelihoods of small-scale producers by enhancing the market linkages and climate resilience of the species raised, together with key local partners. Sustainability is at the centre of SFVC development. Therefore, in this example, the analysis focuses on understanding how climate is impacting on value chain performance (taking care not to neglect other dimensions of sustainability). Once the market opportunities and challenges are identified, the strategy targets these opportunities: it must provide a product that (i) consumers are willing to buy and (ii) is produced in such a way as

to improve the system's resilience to climate change. While the initial target group consists of small-scale livestock producers, value chain upgrading may lead to partnering with a broader range of actors (veterinary services, input suppliers, commercial processors etc.).

The programme provides the context in which the value chain approach is applied to address a particular problem, goal or target. In general, the focus on small-scale livestock producers is often set at this stage. With reference to the livestock sector, this context could include the geographical scope and scale of the VCA (country, regional or district level; sector, subsector, commodity or channel level), as well as the specific primary or secondary objectives within the chain (e.g. animal genetics and breeding, animal health, climate change and resilience, food safety, or livestock policy framework).

Programme context

The overall programme background is reviewed to assess and understand the context in which the programme is being implemented. Key elements include:

- alignment of the programme with policies, strategies and priorities at relevant local, national, regional and international levels;
- geo-strategic alignment of the country, including membership of regional organizations;
- macroeconomic and socio-economic situation of the country or region where relevant to the value chain, including cultural and environmental factors;
- historical context of the programme and previous interventions;
- stakeholder mapping and understanding of the target group, strategic and political partners and other relevant partners and actors; and
- other programmes and institutions operating in the same thematic areas and locations.

1.2 PROGRAMME IMPLEMENTATION

The *modus operandi* of the programme is set out in project documents. **Result frameworks and operational plans** describe in detail the implementation and provide the structure for using the value chain approach. They include the following:

- Instruments and approaches of project implementation:
 - What is the level of intervention (e.g. policy support, institutional support, community development)?
 - What instruments is the programme using in order to achieve its objective (e.g. technical assistance, seconded experts, financial support, infrastructure)?
 - What are the specificities within the livestock sector (e.g. a given species or commodity, or a particular aspect such as animal health)?
- Beneficiaries, strategic partners and other stakeholders:
 - Who are the target beneficiaries of the programme (e.g. pastoralists, women, young people)? What are the key drivers and key challenges they face?
 - Who are the strategic political and implementing partners?
 - Which other stakeholders need to be considered?
- Timeline and resources:
 - What is the timeline of the programme? When is the value chain being upgraded?
 - What resources are available? Is co-funding foreseen? Can public–private partnerships provide additional resources for upgrading?

(Note: The timeline and resources determine the detail and depth of the VCA and define the scope of upgrading activities.)

- Scaling-up and exit strategy:
 - What are the programme’s scaling-up strategies? What supporting value chain interventions are needed?
 - Is there a clear exit strategy from the onset of the programme? Who are the key partners involved? Do they have all the tools they need and have they linked up with the relevant actors so they can carry on with the project after it ends?

1.3 (SUB)SECTOR CHARACTERIZATION

Once the overall programme strategy and context has been clarified, a preliminary assessment of the livestock sector is undertaken, with a particular **focus on market analysis**. It studies the development of the livestock sector and aims to understand existing market opportunities and identify any gaps between demand and supply. It looks at future trends and opportunities. It examines the subsectors and production systems present in the sector, their economic relevance and reach, the actors involved, and the activities of any small-scale livestock producers’ groups and the challenges they face.

The information in Box 3 helps users understand the following:

- Market opportunities and potential, market trends and market segments, trade trends (import/export and domestic markets, market requirements and standards).
- Priority subsectors (e.g. cattle, small ruminants, pigs, poultry), the main commodities (e.g. meat, leather, milk, eggs) and other livestock outputs (e.g. manure, draught power, stock as assets). This is important for value chain selection.
- Livestock production systems, the conditions under which the value chains operate – for example, solely livestock production (landless or grassland-based systems) or integrated farming (rainfed or irrigated) (Robinson *et al.*, 2011) – and the production areas. Note that some challenges and interventions may be characteristic of pastoral systems (conflict resolution around land tenure, restocking), others of mixed systems (use of crop by-products for livestock feeding).
- Economic and social relevance of the (sub)sectors and the contribution of each sector to the socio-economic situation (e.g. to GDP, food security and nutrition).
- Current policies and strategies affecting the (sub)sectors.
- Role of small-scale producers, rural communities and other actors, focusing on opportunities and constraints. Special attention should be given to gender-differentiated roles and capacities, as well as youth.

Based on the programme and context analysis and the characterization of the (sub) sectors, users can **define the objective, scope and parameters of the specific intervention** – a step that should ideally involve also strategic partners. This sets the boundaries of the value chain and of the proposed upgrading interventions.

These guidelines can be applied at all levels of intervention, from local value chains to national, regional and global ones. It is important to define the scope of the value chain before undertaking the analysis: identification of the appropriate product quality (characteristic features, taste, appearance etc.) will ensure successful results.

Furthermore, a livestock value chain may be interconnected with other value chains, since livestock smallholders tend to produce crops and livestock together in mixed systems. Although some farming systems are integrated (e.g. duck–rice farming in Viet Nam), the value chain(s) are treated separately – while nevertheless taking into account the fact that they have areas in common, such as production, opportunity costs and trade-offs, as well as decision-making processes and marketing.

Step 2. Value chain selection

Selection of the value chain(s) is critical for **ensuring the success and impact of project interventions** aimed at developing the livestock sector.

(Sub)sector characterization (see Step 1.3) describes the overall market potential and sector context, and identifies the (sub)sector(s) and actors (focusing on small-scale livestock producers). Based on this information, it is possible to select the value chain (Schneemann and Vredeveld, 2015).

Who should get involved?

A limited number of persons should be involved in value chain selection: key programme partners, other strategic stakeholders (e.g. ministry officers, development partners) and resource persons/experts to assist in the scoring and selection of value chains.

Value chain(s) should be prioritized and selected according to criteria grouped into three broad categories (Figure 9):

- **Market and growth opportunities** – to assess the growth potential of the sector and its competitiveness, in order to understand the potential for a sustainable and significant increase in the employment and incomes of small-scale producers.
- **Relevance of the sector and its development impact** – to assess the relevance of the sector for empowering small-scale livestock producers while increasing resilience, supporting biodiversity and minimizing environmental impact.
- **Strategic factors and feasibility for change** – to assess the opportunities for intervention and the feasibility for stimulating sustainable inclusive growth, taking account of programmed and national priorities.

Within the above framework, the criteria listed in Table 1 can help guide the user in selecting a value chain that can strengthen the livestock sector's competitiveness, empower small-scale producers, and increase their resilience (see also Box 3). Some examples may be found in Schneemann and Vredeveld (2015).

Criteria are selected based on the objectives and scope of the programme and value chain intervention (market access, food security and nutrition, climate and general resilience, animal health and food safety focus etc.), and must be adapted to the specific context under study. All criteria are given a score (e.g. 0–4) and weighted according to their importance to the programme.

FIGURE 9
The framework for livestock value chain selection

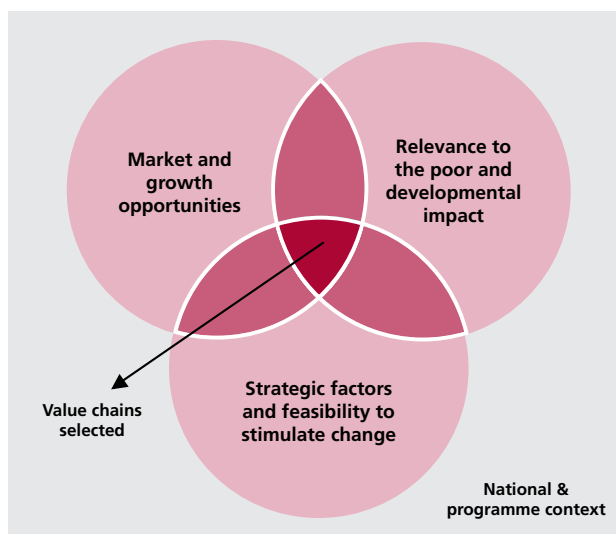


TABLE 1
Selection matrix and examples of key criteria to be considered for the selection of value chains

	Key criteria	Score	Weight
Market and growth opportunities	• Growth potential (current and future demand)		
	• Competitiveness (relative to competitors and substitute products)		
	• Complementarity/competition with existing or potential alternative value chains and livelihood activities (e.g. other livestock, cropping or off-farm employment)		
	• Market systems and regulatory potential for pro-poor growth		
	• Industry leadership, investment opportunities and willingness of lead firms to invest in small-scale producers and enterprises		
Relevance and developmental aspects	• Potential for inclusiveness		
	• Gender and women's empowerment		
	• Employment potential (especially women and young people)		
	• Nutritional benefits		
	• Food safety risk		
	• Sustainability (e.g. natural resources endowment, negative externalities)		
	• Climate resilience potential		
	• Ecosystem services provided		
Strategic factors and feasibility for change	• Zoonotic risks		
	• Opportunities for intervention		
	• Feasibility to stimulate change		
	• Programme mandate		
	• National and/or institutional priority sectors		
	• Complementarity to other interventions		
	• Availability of funding		

BOX 3

Data sources for value chain selection

The preliminary (sub)sector assessment provides a basis for value chain selection. However, based on the criteria selected, additional information and data are needed. This information comes primarily from secondary sources (complemented by primary sources, where necessary).

The criteria can be broken down to identify exactly what quantitative and qualitative data and information are needed. This information feeds into the VCA. (Please refer to Box 5 [p. 42] for more information.) For example:

- **Potential for inclusiveness** includes information and data on:
 - number of small-scale livestock producers;
 - average farm size and number of livestock per small-scale producer;
 - number of micro-/small/medium enterprises;
 - livelihood opportunities; and
 - number of women-headed households.

(Note: Data sources for this criterion may include census data, poverty assessments, livestock livelihood assessments, gender studies and livestock socio-economic studies.)

- **Feasibility for change** includes information and data on:
 - willingness of livestock producers and other actors to change behaviour and practices;
 - potential leverage points; and
 - other development partners operating in the sector (focus of programme, possible synergies, replication of efforts, market-distorting activities).

Based on the chosen criteria, their scores and weights, total scores are calculated and the value chains ranked to make the selection. The selection process can be carried out internally, or together with partners and key value chain actors, validating the selection process and ensuring that strategic stakeholders are on board.

At this stage, it is important to consider how **small-scale producers are involved in a network of value chains**. For example, while a project may target chicken production, it is vital to take account of the fact that small-scale producers frequently supply both meat and eggs; therefore, focusing on only one commodity has repercussions for the second (replacing dual-purpose chickens with specialized broiler strains to increase the meat supply will reduce the egg supply).

Furthermore, while the small-scale dairy sector provides regular cash, it should be appreciated that, depending on herd size and productivity level, the cash generated is not always sufficient to lift a household out of poverty.

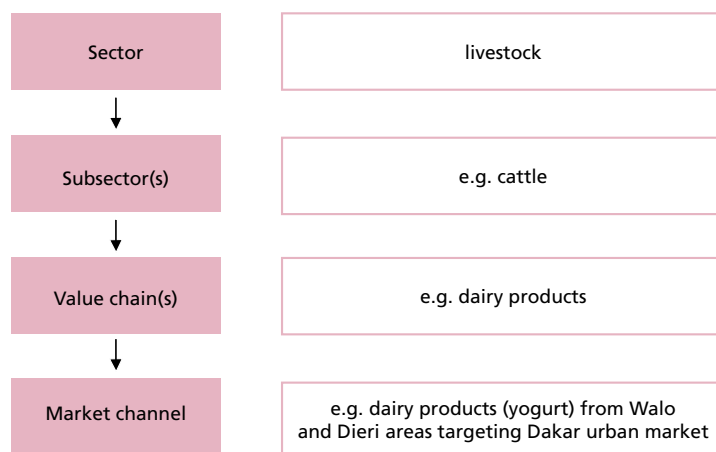
During the selection process, it is necessary to determine the level of aggregation of the intervention. Figure 10 highlights the different aggregation levels: from subsector, to

product or product category, to specific market channel(s). It is important to **diversify risks** by selecting multiple commodities and market channels, while focusing on targeted opportunities and considering resources and time constraints.

Though value chain selection takes place at the planning stage of the intervention, it can be revisited later, during implementation, to accommodate factors such as new end-market opportunities. For example, in the context of a long-term programme targeting the dairy cattle subsector in a given region, it can be decided, on the basis of the assessment of market opportunities, to start with fresh milk and improve its hygiene and presentation, improve the milk value chain and later develop processing for specific milk products (e.g. cheese, yoghurt).

FIGURE 10
Breakdown of livestock sector for analytical and intervention purposes

Geographical scope: e.g. Senegal



Source: Adapted from Nuweli et al., 2013.

Step 3. Value chain analysis

Value chain analysis (VCA) **examines various market systems producing a particular commodity or group of commodities**. In order to develop the sector, the value chain approach is adopted as an analytical framework for understanding these systems, the opportunities they offer, and the market failures that affect competitiveness and sustainable inclusive growth. The diagnosis can then be shared and validated together with value chain actors, service operators and strategic partners in order to design upgrading strategies.

Who should get involved?

Extensive value chain analysis (VCA) entails obtaining information from the different actors involved, i.e. producers and producer organizations, but also stakeholders engaged in support functions and the enabling environment. This step therefore requires greater actor involvement. Interviews, group discussions, visits to value chain actors and surveys are important for understanding conduct (Box 5, Part 2, p. 43) and for identifying what incentives might produce changes in behaviour. VCA is an opportunity to raise awareness and obtain buy-in from key partners who will be involved in subsequent steps of the value chain cycle.

3.1 END-MARKET ANALYSIS

The central driver in the value chain is the end-market – in the case of the livestock sector, that means the product market. Ultimately, the performance of the livestock value chain is dependent on the performance of the end-market through the related market channels. Hence, it is first necessary to **understand the market status, opportunities, dynamics and trends** as they set the parameters for economic growth (Table 2).

This includes an estimation of expected growth in demand for livestock products embedded in the context of the programme. For example, consumption statistics can be extracted from databases to understand national consumption trends for different livestock products and gain insight into growth perspectives (see Box 4).

Breaking down end-markets into market segments and market channels is useful for understanding the characteristics of those individual market components and their potential for growth. Comprehensive market knowledge is critical for value chain actors and supporting actors when investing resources and building capacities to position products and services in specific market segments.

BOX 4

End-market selection

- **Local, national and regional markets** – potential starting point, as they pose fewer issues in terms of logistics and distance for instance.
- **Informal markets** – positive in terms of lower prices, better access to consumers in rural areas and to the poor, and greater product freshness. Linking to formal markets will bring benefits in terms of upgraded products, resulting in increased prices and margins. On the other hand, lack of regulation implies risks in terms of food safety, zoonoses and public health.
- **International markets** – usually difficult to access due to stricter regulations, sanitary and phytosanitary standards, traceability requirements, need for supply reliability etc.

It is important to target multiple interrelated end-markets types, segments and channels in order to minimize risk and ensure success of upgrading activities.

The end-market analysis should consider domestic and international markets:

- **Domestic markets.** National and local – formal and informal – markets should be considered. Small-scale producers usually operate in informal markets; hence an understanding of these and their linkages to formal markets is important.
- **Regional and international markets.** Regional and global market trends and trade patterns, as well as export market opportunities, should be assessed, together with the requirements and quality specifications needed to access those markets.

Markets are dynamic; market analysis is not a one-off activity. Market analysis needs to be continuously revisited throughout the implementation of the project to keep abreast with trends, new growth opportunities, competitors, upcoming niche markets and changes in the regulatory environment. For instance, at the end of the 1990s, in order to address a decrease in the demand from the administration for traditional woollen products (blankets) from Decanni sheep bred in India, it was decided adopt alternative means to take advantage of the quality wool produced by the breed. New products such as bags were developed, targeting the export market, which in 2005 represented 74 percent of sales, with a federation of self-help groups coordinating the transformation of products (LPP *et al.*, 2010).

Though end-markets are the driving force, a value chain is made up of numerous market components, such as input markets and service markets. Intermediary markets exist at all stages of a value chain.

For example, in the finished leather shoes market in Ethiopia, intermediary products in the associated value chain are also exported. These include live animals (for export to halal markets in the Near East), raw hides and finished leather (for export to China for the manufacture of shoes). In order to curb the trade of intermediary goods, the Ethiopian Government has applied a tax on the export of unfinished and semi-finished leather to encourage “Made in Ethiopia” manufacturing of finished leather products. The tax programme was first applied in 2008 and consisted of a 150 percent export tax on raw hides and skins and semi-finished leather products.

TABLE 2

Aspects of end-markets to be assessed, with relevant information and data needed

1	Type of market	<ul style="list-style-type: none"> • Market location and proximity: local markets, domestic markets, regional markets, export markets, distance to transhumance roads • Market type: high-end-market, niche market etc.
2	Market segment and channels	<ul style="list-style-type: none"> • Differentiation of market segments • Characteristics of segments: price-leadership, quality leadership, differentiation
3	Size and growth	<ul style="list-style-type: none"> • Size of markets, including volume and value • Ten-year forecasts and growth rates
4	Trends and dynamics	<ul style="list-style-type: none"> • Prices (over the year, across years, according to grades) • Consumer preferences, branding strategies, wholesale and retail distribution procurement systems • Drivers of the dynamics (including behaviour of lead actors, free trade agreements, regulations) • Determinants of demand, including seasonality, religious holidays, economic cycles
6	Critical success factors	<ul style="list-style-type: none"> • Identify critical success factors in these markets (e.g. price, quality, branding) • Key players and their competitive strengths • Current and potential competitors and possible substitutes (that influence price and trade volume) • Benchmarking (current position vs most competitive country/firm)
7	Operational practices and barriers to entry	<ul style="list-style-type: none"> • Operational practices, such as logistics • Standards (especially sanitary ones), quality, quantity and reliability required to access market
8	Small-scale producers' access	<ul style="list-style-type: none"> • To complement the above, a specific analysis of the constraints faced by small-scale farmers (e.g. limiting rules and regulations, physical distance)

A further tax of 150 percent was applied on crust leather in 2012 (Fitawek, 2016). As a result, the export of hide and semi-finished leather dropped by 38 percent over the period, while export of finished leather and footwear increased by 75 percent and 44 percent, respectively.

3.2 VALUE CHAIN MAPPING

Value chain system mapping forms the basis of VCA. It reduces the complex economic reality of diverse business operations, multiple actors, interdependencies and relationships to a **comprehensible visual model**. The map acts as an analytical tool as well as a communication tool.

A sustainable value chain is part of a wider market system, with actors working in numerous segments (e.g. input markets, intermediary product markets, support service markets) in order to meet the needs of the end-market. It is necessary to understand this system in its entirety, because the underlying causes of any constraints to competitiveness may lie in the supporting market system or in the enabling environment.

While understanding the overall market system, it is necessary to break down the various components (business operations, markets players and business relations) of the value chain into its interdependent subsystems. A value chain operates on three levels:

- **Core value chain** – consisting of the actors involved in the production, aggregation, processing and distribution (wholesale and retail) of the product along the value

chain, together with the links connecting them (type of relationship, quantities involved by market channel etc.).

- **Extended value chain** – including supporting functions that ensure smooth business transactions, such as provision of knowledge and skills, research and development services, inputs such as feed, veterinary and financial services.
- **Enabling environment** – comprising organizations, and formal and informal rules and regulations governing business transactions. These all take place within a political, economic and social framework that is dependent on, and at the same time influences, the natural environment.

Box 5 details the main information sources to be used for value chain mapping.

BOX 5

Data and information sources for value chain mapping (1)

Part 1. Desk review of secondary literature

For many value chains and livestock subsectors, a great deal of published information from research institutions, development partners and governments already exists. It is important to review and analyse this information before establishing what primary research and/or fieldwork is needed to obtain specific data, fill information gaps or update information.

Secondary and primary data and information for the analysis feed (as baseline data) into the monitoring and evaluation (M&E) process for the value chain intervention(s). However, data sourcing for M&E purposes needs to be carefully designed, as data must be consistent and comparable over time.

Secondary research

When gathering both quantitative and qualitative data, a desk review must be undertaken of the following:

- Own programme documents and those of development partners (operating in the same geographical location, [sub]sector and value chain).
- National documents, data and strategies from ministries of agriculture, industry, trade etc.
- Census statistics, socio-economic surveys from census, statistics bureaus and relevant institutions (ministries, central bank, customs office).
- Sectoral strategies and research papers from ministries, national research agencies, regulatory bodies, think tanks, professional and industry associations.
- Trade and market data and documents, global databases (e.g. FAO, World Bank, International Trade Centre Trade Map).
- Industry and sector surveys and documents from international organizations (e.g. FAO, World Bank, International Monetary Fund [IMF], International Livestock Research Institute [ILRI]) and other development partners.

BOX 5 (cont'd)

Data and information sources for value chain mapping (2)**Part 2. Primary research*****Primary research***

The desk review of existing data and information will help identify information gaps that can be filled through primary research. The selection of one or more research methods depends on available resources (budget, human resources and time) and the kind of information needed. Triangulation through different data collection methods helps validate the data.

Socio-economic data collection methods

- **Key informant interviews** – usually used to obtain targeted information from strategic actors (operational value chain actors and organizations throughout the extended value chain or political) and a typical first step in data gathering. Interviews are usually conducted in an open or semi-structured format and typically collect qualitative data (but may also validate quantitative data). Key informants include senior political partners, implementing partners (public and private), community and association heads, leaders in academia and science, and other development partners.
- **Focused group discussion** – a form of qualitative data research, usually involving a group of persons (up to 10) with similar roles and functions in the value chain. Discussions are conducted in a semi-structured format covering relevant topics specific not only to the group but to the chain as a whole.
- **Surveys** – involving wider groups for the collection of both quantitative and qualitative data. Questions can be closed or open-ended, self-administered or conducted by enumerators or project staff. Surveys must be carefully designed (topics to be included, sample size etc.) and tested prior to being conducted. Surveys using the same format can be conducted throughout a project for M&E purposes.
- **Field visits and observations** – central to understanding the programme context, can complement the above research. Data are typically qualitative (observations and insights into the value chain and project sites), but can also be quantitative.

BOX 5 (cont'd)

Data and information sources for value chain mapping (3)**Characterization of livestock production and other tools**

Phenotypic characterization of the animals is a prerequisite for the assessment of production levels. It is important to quantify the performance of the principal production traits (size, growth, milk production, fertility, egg production etc.) and to identify possible improvements either on the breeding side or in the production environment (feed, veterinary care, housing etc.).

- **Primary characterization** refers to activities that can be carried out in a single visit to the field. It includes measurement of animals' morphological features, interviews with livestock keepers, observation and measurement of some aspects of the production environment, mapping of geographical distribution.
- **Advanced characterization** requires repeated visits. It includes measurement of productive (e.g. growth rate, milk production) and adaptive (e.g. resistance or tolerance to specific diseases) capacities. As most traits of economic importance require advanced characterization, some trade-off may be required depending on the available resources.

To ensure that sampling characterization is not limited, proxy indicators of production traits may be used (adult body weight or length, estimation of dairy production based on a specific farmer survey etc.).

For further information, refer to the FAO guidelines on phenotypic characterization of animal genetic resources (FAO, 2012).

The scope of a project may require use of specific tools – for example, epidemiological studies when focusing on zoonotic risk, or phenotypic characterization when considering the productivity of animals.

Refer to Annex 3 for questions about and information relevant to the various stages of livestock VCA (in terms of business operations, and combining both quantitative and qualitative data).

Part 3. Validation of data, value chain analysis and mapping

All data collected should be verified by carefully cross-checking through **triangulation**, for example. Before defining a value chain development vision and formulating an upgrading strategy and action plan, it is useful to vet and validate the VCA and conclusions through a **stakeholder workshop**.

The workshop brings together stakeholders who are responsible or strategic for critical business operations, services provision and the enabling environment. Academics and think tank members familiar with the industry and value chain should also be invited. As the central actors and key driving force in the development of the sector, these participants are critical for designing the upgrading and intervention strategies. They also help prioritize the opportunities to seize and challenges to overcome.

FAO. 2012. *Phenotypic characterization of animal genetic resources*. D. Rome, FAO (available at <http://www.fao.org/docrep/015/i2686e/i2686e00.pdf>).

Core value chain map

Production of a commodity takes place in the core value chain (meat, milk or dairy products, eggs, skins and hides, or live animals). The core value chain comprises mainly private-sector actors; through their business linkages they transfer inputs into a product in order to meet the demands of the end-market. Figure 11 (p. 48) provides an example of the mapping of a beef core value chain (comprising the following four steps).

1. End-market

In the context of market-led development, the value chain map begins with the selected end-market analysed in Step 3.1 (p. 39): what products are being produced, for what end-market, with what quality, in what quantity, and according to what consumer preferences. End-market is a critical component of the personalization of the value chain (see Box 6). "Personalization" is the process through which a value chain matures and becomes unique in response to the demands of the particular context in which it exists. One product can serve several end-markets, through various market channels. Therefore, within one value chain there may exist subsidiary value chains based on different market channels. Value chain maps should focus on interrelated market channels, in which production, aggregation and processing are interlinked.

2. Core business operations

The main business functions that add value to the product along the value chain to the end-market need to be mapped out. A short description can be included to explain what these functions entail. The complexity of and linkages between the functions depend on the commodity's value addition. A livestock value chain usually includes five core functions:

- inputs to the livestock sector, including animal genetics, feed and veterinary drugs;
- production and its organization;
- aggregation and its organization, comprising marketing, collection of products, storage (including cold chain), fattening, transport and trading;
- slaughtering, processing and manufacturing; and
- distribution to the end-market, either directly to local markets or to wholesalers, retailers and exporters for international markets.

3. Core value chain actors

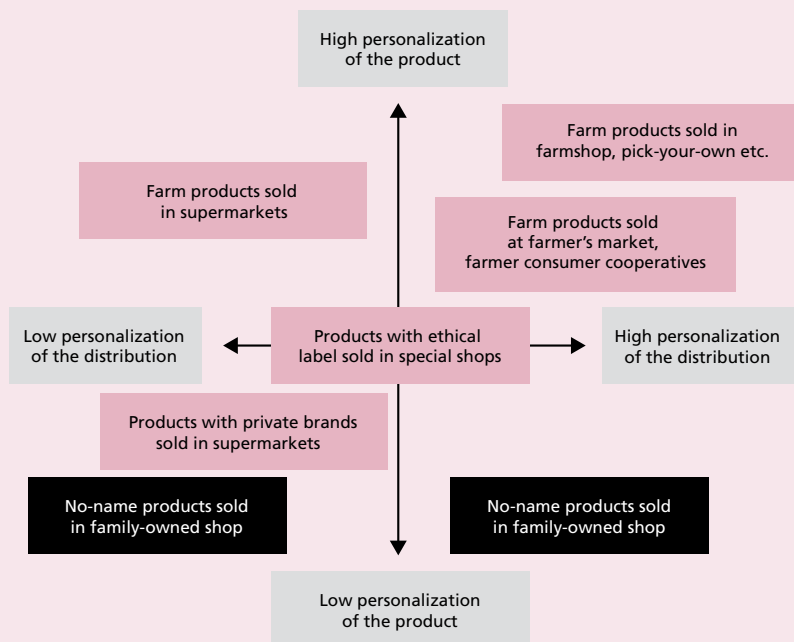
Value chain actors are the individuals and enterprises who directly operate in the production, aggregation, processing and distribution of a commodity. They are largely private actors (e.g. livestock keepers, traders, micro-/small/medium enterprises or private manufacturing companies), but can include public institutions (e.g. animal genetics and other input providers). There is a wide variety of actors. They differ in terms of size, contribution to the chain, access to and control over resources (e.g. inputs and technology), and connections to the end-market (e.g. business relations and market channels). Note that sufficient inputs are crucial to livestock value chains as they raise productivity.

In some cases, the same value chain actor is present in more than one business. This is often the case in vertically integrated supply chains where, for example, firms engaged in pig meat production may also own feed mills (inputs), male or female reproducers (inputs), their own slaughtering facilities (processing) and their own retail outlets (distribution).

BOX 6

Identifying niche markets for livestock development

In marketing, small-scale livestock producers often face problems related to limited supply, lack of financing, infrastructure and services, or low bargaining power. Niche marketing offers opportunities to overcome weaknesses and differentiate their products, by addressing consumers through alternative supply chains. The development of a niche marketing strategy relies on the perceived experience and perceived superiority of a food product in terms of quality. Personalization of the product and marketing channel is closely connected to the partners involved in the value chain network (see Figure).

Personalization of the marketing channel and products

Source: Adapted from Sidali, Kastenholz and Bianchi, 2015.

A project targeting short value chains to improve the value added of products from rare livestock breeds examined French case studies and identified the following keys to success:

- building a network involving all relevant stakeholders (farmers, processors, retailers etc.);
- ensuring long-term coordination of the network;
- sharing a common vision and common objectives;

(cont.)

- highlighting links to history and culture;
- developing products and markets in a way that is consistent with the production capacity of the livestock keepers involved;
- establishing adequate quality indicators or labels;
- identifying relevant economic and technical indicators; and
- maintaining links with partners.

Although such initiatives can be started on a small scale and with limited capital inputs, they may be skill and knowledge intensive, requiring long-term commitment from involved stakeholders

Source: <http://www.varape.idеле.fr/>; LPP et al., 2010.; Sidali, Kastenholz and Bianchi, 2015.

4. Business linkages

Business linkages show the flow of the product. They include elements such as information exchange, technical skills, know-how and technology exchange, price determination, payments, contracts and embedded services.

The market system of a value chain comprises multiple market transactions as the product moves along the different stages of the chain. These can range from uncoordinated and ad hoc “spot market” transactions, to binding contracts (with embedded services and secured markets) and vertical integration (see “Governance”, Step 3.3.2 on p. 55).

Business linkages in a value chain entail both vertical and horizontal linkages.¹

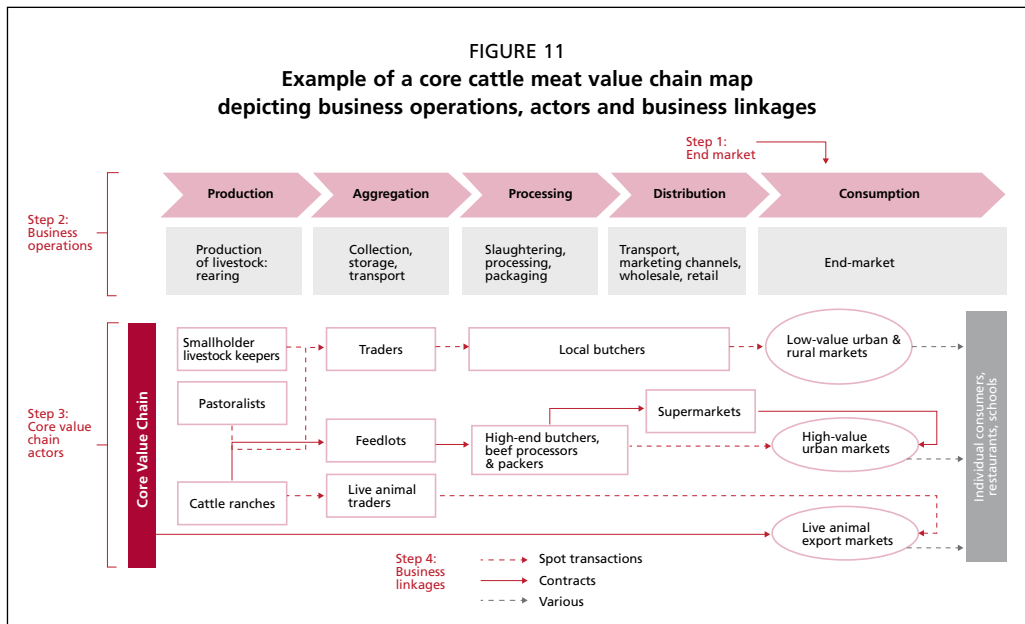
- **Vertical linkages** are linkages between actors at different stages of the value chain (upstream to downstream) where an enterprise covers several functions on the value chain or has close relations to upstream production.
- **Horizontal linkages** entail collaboration (or conflict) with actors operating at the same stage of the value chain. Horizontal collaboration through strengthened producer organizations is particularly important for empowering small-scale livestock producers and lowering transaction costs.

The type of business linkage depends on the market requirements. For example, in regular, informal local markets, spot transactions are suitable when small-scale livestock producers sell their animals.

However, formal markets are more regulated, and end-market requirements are more stringent in terms of standards, quality, reliability and quantity. More formal contracts and coordinated relations are necessary to make sure the demands of the end-market are met.

In a dairy value chain, a commercial farm that produces and processes dairy products may engage neighbouring, small-scale livestock producers in binding contracts to ensure a steady supply of quality milk. It can also provide embedded services, such as veterinary assistance (including artificial insemination) and animal feed, the costs of which are deducted from payment for the milk.

¹ The terms “horizontal linkages” and “vertical linkages” do not relate to the direction used when mapping the linkages between actors. A value chain map can be drawn vertically or horizontally and does not affect the terminology.



The information and mapping of business linkages provide the basis for the governance analysis (see Step 3.3.2 on p. 55).

Figure 11 maps out the core value chain, showing the functions, the actors and their relationships (business linkages). Note that depending on their importance, some input providers (genetic material, drugs) may be either considered as part of the core value chain, or among the support services which are required at different stages of the value chain. A value chain map usually comprises two other layers: the support functions and the enabling environments (see “Extended value chain map and enabling environment”). Geographical information can also be used (Box 7). All this forms the basis of the value chain analysis.

Extended value chain map and enabling environment

1. Support functions and actors

The core transactions and value chain actors are supported by business development and other related services that facilitate the production, aggregation, processing and distribution of the product(s) along the value chain to the end-market. These actors may be public sector service providers (e.g. extension service providers, marketing boards, health and safety inspection agencies, development banks) or private bodies (e.g. loan companies and cooperative banking services, certification bodies, professional associations).

Often, service providers cover multiple value chains and sectors and are important leverage points for scaling up and cross-sectoral improvement.

The three main types of support functions are:

- **Input providers** – found throughout the value chain, supplying not only the main inputs needed for production but also more specialized items such as liquid nitrogen for artificial insemination tanks, chemicals for tanneries, and packaging for distribution.
- **Non-financial services** – including veterinary services, extension services, inputs

BOX 7

Geographic Information System (GIS) mapping and geographical mapping (1)

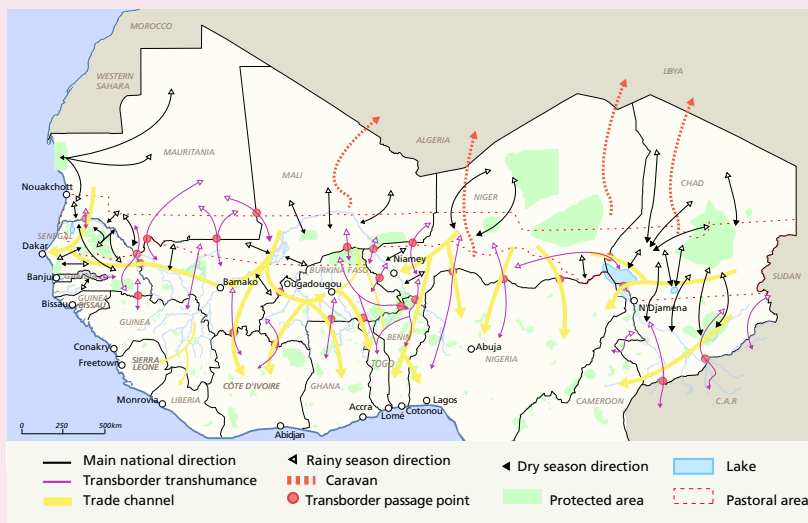
To complement the value chain map, the user can represent product flows and production areas using Geographic Information System (GIS) mapping of the livestock subsector to better assess the opportunities and constraints faced in the value chain. GIS mapping includes information such as population density, commercial farms, small-scale livestock producers, pastoralist stock routes, roads and infrastructure.

Simple geographical mapping can also be drawn to highlight production areas and the physical location of other stages of the value chain, in relation to specific project issues, such as:

- Where are the production areas located?
- What are the pastoralist routes?
- Is there seasonality in trade and movement patterns?
- Where is the aggregation point and markets for intermediary products?
- Where are processing plants located?
- Where are end-markets located and what routes are they distributed on?
- Where are the areas to be monitored for potential wildlife/livestock, livestock/livestock or livestock/human contact in relation to zoonotic risks?

The example below illustrates the complexity of livestock trade in West Africa, underlining the border crossing points for livestock.

Synthesis of recent national and cross-border movements and livestock trade patterns in West Africa

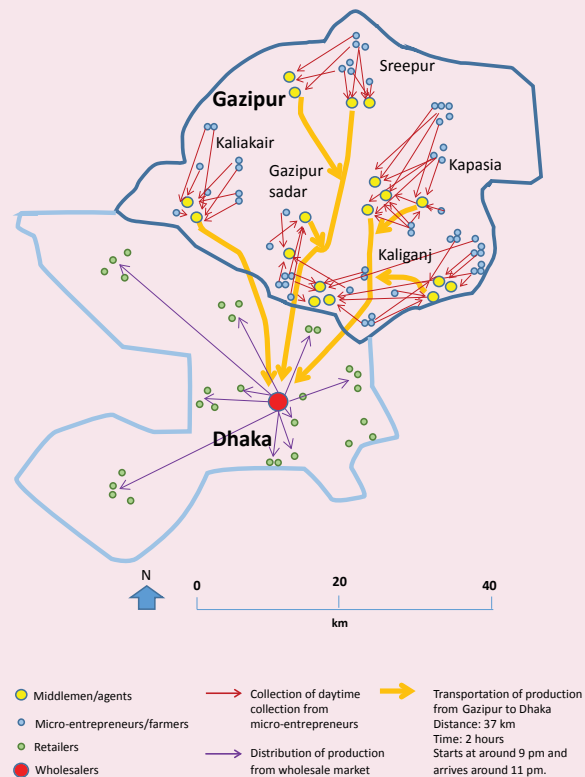


Source: Adapted from CIRAD and FAO, 2012.

BOX 7 (cont'd)

Geographic Information System (GIS) mapping and geographical mapping (2)

This example maps the actors and flows of a commodity (eggs and chickens) from small-scale producers in Gazipur district of Bangladesh to outlying districts of the capital, Dhaka, where most of the consumers are located.

Origin and flows of a poultry value chain in Bangladesh

Source: Adapted from Khaleida and Murayama, 2013.

provision, R&D, laboratory testing, certification, and health and safety inspection, training and skills.

- **Financial services** – comprising government-run institutions, cooperative savings groups, or private loan providers. The services they offer include microcredit, livestock insurance, equipment and infrastructure finance, and embedded credit. They are fundamental in providing the working and investment capital necessary for sustainable value creation (see Box 8).

BOX 8 Finance

Access to suitable financial services is critical for ensuring the competitiveness and sustainability of a value chain. The livestock sector is unique in that live animals themselves represent a financial asset which livestock keepers use as collateral and for savings and wealth creation.

Financial instruments relevant to livestock owners include: savings (individual or group savings); loans (from banks and microfinance institutions [MFIs]) for working capital, equipment, infrastructure and animal purchases; embedded credit from suppliers, traders or processors; and animal insurance.

Loans for, and investment in, livestock are often viewed as risky. It is therefore important to work on the improvement of linkages with finance. Providing farmers with basic skills in marketing, accountability and financial planning, or with support from a cooperative can often help to improve such links.

Aspects of both demand and supply need to be considered:

- **Supply.** What are the financial services available to value chain actors and what form do they take? Who are the main actors providing these services (banks, MFIs, value chain actors (embedded credit), cooperatives, rotating savings and credit associations (ROSCA)? Are they formal or informal? What services and products are available and are they suitable for small-scale livestock producers (e.g. mobile banking, warehouse receipt systems) or for women? What are the terms and conditions, and the transaction costs (e.g. distance to bank)?
- **Demand.** What do finance and financial services require from value chain actors? What is the financial literacy and the level of understanding of those actors?

2. Enabling environment

To understand the context and framework in which the selected value chain(s) operate, it is necessary to examine the enabling environment. The enabling environment includes: societal elements (e.g. government policies, cultural factors) where business transactions are governed by formal and informal rules and regulations (Table 3); infrastructure (transportation, roads, cold chains etc.); and natural resources (land, water, climate) (Table 4) critical to the productivity and sustainability of the livestock sector.

The private sector is the central actor in a value chain and the driver of the value chain and transformation process. Private actors organize themselves into federations, chambers and associations in order to get better access to inputs and services or product markets, or to lobby and engage with the public sector on a level playing field so as to create a conducive enabling environment. In turn, the public sector promotes private–public dialogue in order to engage with the private sector and address its needs and constraints.

Regional and international enabling environments may also need to be considered, depending on the scope of the intervention and markets. For example, with nomadic

TABLE 3
Societal elements

Elements	Sub-elements and examples
Institutional elements	<ul style="list-style-type: none"> • Political strategies and policies (e.g. poverty reduction strategies; safety nets, including care service provision) • Economic strategies and policies (e.g. export promotion; subsidies; tax reduction for imports of raw materials and machinery) • Trade agreements (e.g. Everything but Arms [access to EU markets]; ASEAN Free Trade Area [trade bloc agreement between Southeast Asian countries]) • Laws, regulations and enforcement thereof (e.g. input and output markets; land tenure; property rights; contract law enforcement; by-laws for cooperatives) • Standards, certification and licensing (e.g. CODEX and other food safety standards; licensing restrictions for para-veterinarians)
Organizational elements	<ul style="list-style-type: none"> • Standards, certification and licensing (e.g. CODEX and other food safety standards; licensing restrictions for para-veterinarians; Animal and Plant Health Inspection Service of the United States Department of Agriculture [USDA APHIS]) • Education, hospitals and research facilities • Industry, sectoral and professional associations (e.g. Ethiopia Meat Producers' Export Association)
Infrastructural elements	<ul style="list-style-type: none"> • Public infrastructure (e.g. roads; railways; transport facilities) • Natural infrastructure (e.g. stock routes; watering holes) • Market infrastructure • Trade infrastructure (e.g. ports; dry ports) • Other infrastructure (e.g. information and communications technology [ICT]; electricity grids)
Sociocultural elements	<ul style="list-style-type: none"> • Cultural and religious norms and customs (e.g. halal meat preparation) • Informal political linkages and patronage • Community status • Gender-based systems • Consumer preferences

TABLE 4
Natural elements

Elements	Sub-elements and examples
Natural elements	<ul style="list-style-type: none"> • Availability and use of natural resources (e.g. land; soil; climate; weather; biodiversity; pastures; feed; forage; genetics) • Animal and plant health

pastoralists, livestock routes can be transboundary; hence a bilateral and regional enabling environment is relevant. With global beef or dairy value chains, the international enabling environment, such as CODEX food safety standards, is important.

Not all elements can or have to be mapped out in the value chain, although they should be considered during analysis of the selected value chain(s). In order to prioritize which enabling environment elements are to be included in the mapping, it is important to differentiate between the following: essential conditions (e.g. trade agreements, land tenure and property rights, infrastructure); sufficient conditions (e.g. standards and certification); and useful conditions (e.g. informal networks).

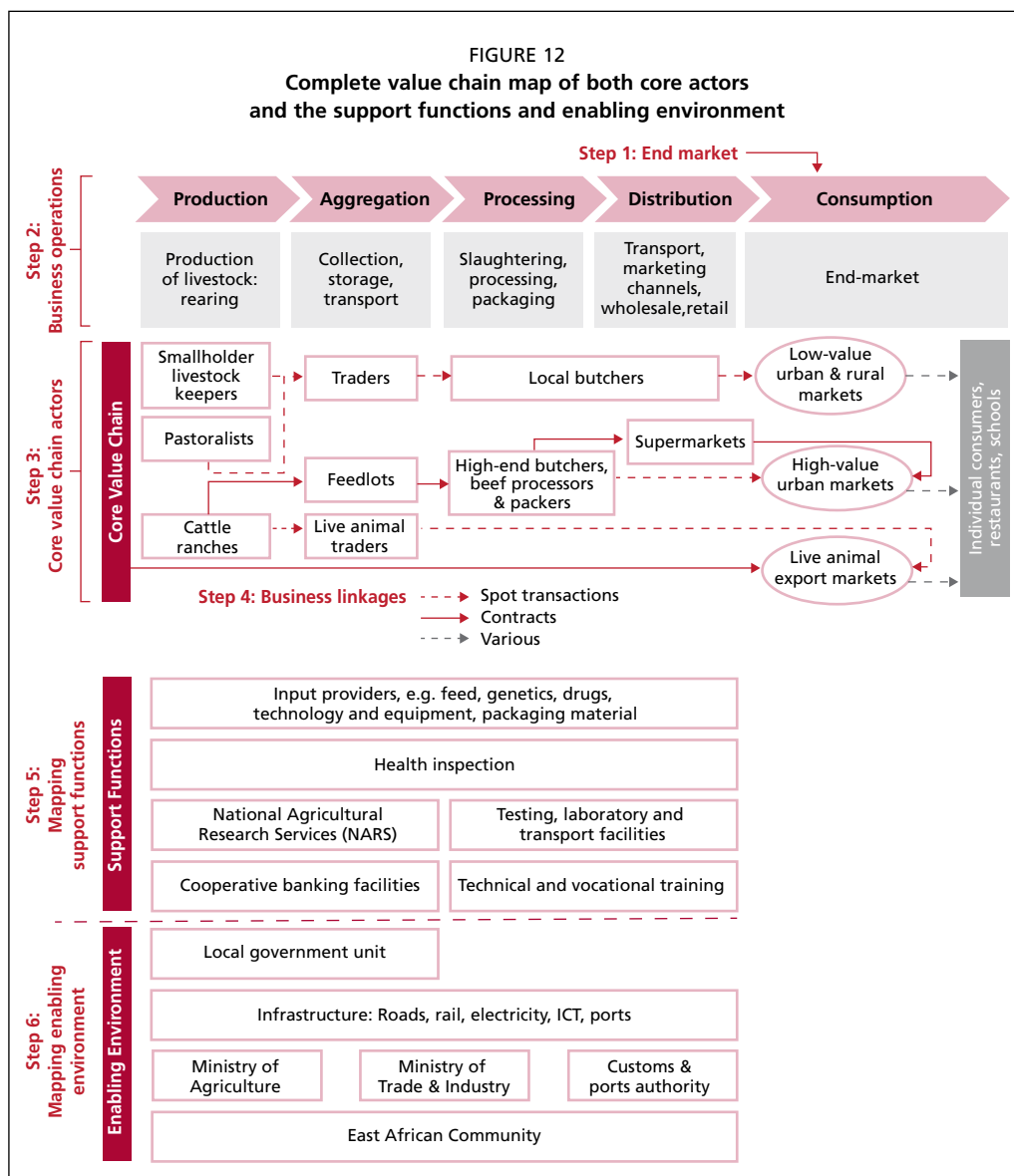


Figure 12 is a continuation of the core value chain map (Figure 10 on p. 38), depicting the layers of support functions and the enabling environment. Together they form one value chain, laying the basis for the value chain analysis.

3.3 ANALYSIS OF THE VALUE CHAIN

Once the value chain is properly mapped, further analysis should **determine value chain performance in terms of incentives, capacities, governance, economics and sustainability**. Specific approaches can then be adopted to identify inefficiencies, points of leverage, trade-offs, strengths, weaknesses, threats and opportunities throughout the value

chain; this process is known as market system and strategic analysis. Note that the analytical tools described do not represent an exhaustive list. They should be completed with specific analyses (e.g. food loss evaluation, life cycle assessment) depending on the focus of the programme (see also Boxes 9–17).

3.3.1 Incentives and capacities

To develop a livestock value chain, it is necessary to first: understand the behaviour of market actors; work out why in some cases the market system is underperforming; and identify what capacities, functions and rules are inadequate, mismatched or absent (The Springfield Centre, 2015). The way actors behave is shaped in part by their environment and culture, but also by their capacities and the incentives offered by the system. In the specific case of livestock, it is especially important to consider issues such as access to market (in terms of physical access, product conservation, and information on market prices); capacity to meet seasonal variations in supply and demand; and the multi-functionality of livestock (i.e. the use of animals as cash reserves).

To facilitate change in the behaviour of value chain actors (whether at individual level or in their interactions), it is important to understand not only the ability to change (capacity) but also the willingness to change (incentives). Incentives (both financial and non-financial) determine why actors behave in a certain way, why they make certain decisions, and what motivates them to change their behaviour. It is therefore important to understand the different roles livestock play for small-scale producers – besides actual production – and how these roles interact.

In the Gambia, for instance, cattle farmers prefer the N'Dama breed to crossbred animals or zebu. Despite their smaller size and milk production, N'Dama are viewed as more resilient and are prized as draught animals (Traoré, Reiber and Zárata, 2018). Another issue relates to the capacity of producers to respond to price variations and peaks in demand for small-ruminant meat during Muslim religious festivals.

Budisatria *et al.* (2008) showed that in some regions of Indonesia, farmers were unable to provide animals of the right age and size in time for festivals (i.e. when they fetch higher prices). Flocks were small and animals were kept to meet urgent cash needs, in particular at the end of the dry season and at the start of the school year.


A review of incentives and capacities must take into account different orientations and levels and consider a wide range of different elements (see Table 5).

Collective action – critical for small-scale producers to overcome market failures and maintain market positions (Markelova *et al.*, 2009) – needs both capacities and incentives to succeed. Although individual and institutional capacities (i.e. accountability and enforcement rules) need to be in place, incentives for cooperation (i.e. the risks and costs involved vs the benefits of an action) are critical to ensure the success of a collective initiative.

Furthermore, incentives and capacities must not be considered in relation to a single value chain. They must be viewed in terms of how they affect related value chains and off-farm factors.

For example, when a small-scale producer is deciding whether or not to purchase more expensive, improved breeds, he or she must take into account not only farm expenditure but also off-farm expenditure (food items, schooling etc.), as well as eventual crop trade-offs.

TABLE 5
Potential incentives and capacities to be considered

	Orientation and Level	Elements to be considered
Incentives	Economic	Financial <ul style="list-style-type: none"> • Profit margins • Prices of inputs and products • Cost structure • Transaction costs • Opportunity costs • Competition • Attitudes towards risk • Risk factors • Resources
	Social or purpose-oriented	Non-financial <ul style="list-style-type: none"> • Cultural norms and ethics • Personal preferences and attitudes • Reputation and status • Gender roles and responsibilities
Capacities	Individual	 <ul style="list-style-type: none"> • Technical (knowledge and ability) • Financial (to undertake actions) • Physical (assets, human resources, outreach such as customer base) • Strategic (vision, networks, governance) • Informational • Social (status, reputation) • Personal or cultural (attitudes, leadership etc.)
	Institutional	
	Enabling environment	

The decision depends on input insurance, extension advice on the benefits of improved breeds, market linkages and even credit provision for on-farm and off-farm expenditures.

Livestock have numerous roles linked to incentives. From an economic perspective, while contributing to food supply and cash income generation, livestock can also be considered as collateral for a loan or as a source of manure for sale or use as fertilizer. Social factors also come into play: animals confer status or weighting in the gender balance and in the distribution of power. Women raising livestock tend to prefer hardy, low-input breeds that can forage for themselves and reproduce easily (FAO/Köhler-Rollefson, 2012).

3.3.2 Governance

Analysing the governance structure of the value chain is important for **understanding the dynamics and distribution of power** among the various actors involved. "Governance" refers to the relationships between the buyers and sellers, and between the service providers and regulatory institutions operating within the system or influencing its functions and activities. It covers also any kind of collective action, i.e. voluntary action of a group to achieve a common goal, which includes existence of professional and sector associations at regional and national level (e.g. dairy or exporters' associations).

BOX 9

**Livestock issues to consider in value chain analysis
(from the production side)****Animal breeding**

- Breeds kept in the target area (exotic, crossbred, indigenous etc.); breeding practices and production systems; main advantages/disadvantages of each system from the local perspective; differences between breeds, practices and systems.
- Major breeding-related problems in the development of livestock production in the area, and possible solutions.
- Products, services and trends related to animal breeding/artificial insemination; access, costs and payment issues.
- Location of suppliers (artificial insemination, reproducers) and accessibility for targeted small-scale producers.
- Main constraints to the management of animal breeding (land, labour, capital, information).

Animal feeding

- Feeding practices applied (feed sources, types and quality); feed and water availability (by season); supplementary feeding strategies; feed and supplements collected/purchased (by season); feed conservation/storage systems; coping strategies for forage scarcity; main constraints related to feeding, and gender and age of feeders.
- Relative productivity and resilience of the different forages available.
- Quantities of feed purchased (crop residues, green fodder, industrial by-products etc.); main sale and purchase channels; prices applied in these channels in different seasons.
- Availability of advice on feeds and feeding; actors involved and quality of advice.
- Systems used for feed production and supply.
- Prices of different feeds and fertilizers available and affordability for target groups (consider seasonal price variation and payment terms).
- Production and sale volumes of feeds and fertilizers.
- Accessibility of feed and fertilizer suppliers to target groups.

Animal health and veterinary services

- Economically important animal health issues (prevalence, morbidity, mortality rates, causes, impact, disease control strategies used, treatments etc.).
- Availability, reliability and sales volumes of drugs and vaccines, acaricides, insecticides and other chemical treatments.
- Service providers commonly used (public, private, community-based) and their relative advantages and disadvantages.

(cont.)

Livestock identification and traceability

- Livestock identification and traceability systems used. What are the costs and benefits of compliance? For which markets are they important?

Food safety/quality control and certification

- Organization of food safety/quality control. Who are the eventual services providers and how are services paid for?
- Sanitary and phytosanitary requirements for trade according to different potential markets.
- Certificates of origin and health inspection; market requirements.
- Awareness of small-scale producers about standards and certification processes.

Source: Adapted from IFAD, 2016a.

These governance structures can be both public and private, such as voluntary industry standards. Governance analysis builds on the analysis and mapping undertaken in Step 3.2 (p. 41) on business linkages and coordination and looks at the system of coordination, regulation and control along the entire value chain. It describes the power relations in the chain and in the establishment and enforcement of rules that determine the overall shape of a specific value chain. The analysis of the governance structure should also look at information, finance and knowledge flows, price determination, the role of lead firms² and producer organizations, contracts and horizontal linkages.

Attention must be paid to the rules and enforcement of governance, taking into account the enabling environment. This entails: determining the balance of power between actors; identifying the drivers behind the formal and informal arrangements between actors; and ascertaining if and how the relationships are enforced by a legal framework, private standards or cultural norms (see Box 11).

The institutional set-up includes both formal and informal rules which govern the value chain actors and are key in determining, through incentives and capacities, the level of efficiency of the chain, the distribution of benefits along it, and the gender role and empowerment of women and other vulnerable categories.

For example, in the Kara region of Togo, various factors limited the empowerment of female pig farmers. The main constraint identified was that women were often unable to sell their animals without the approval of their husbands. Furthermore, they were not allowed to handle slaughtering activities – a constraint that limited the added value they could capture by commercializing meat instead of live animals. These issues were addressed through capacity building (involving both men and women) and awareness-raising (among community leaders and local authorities) (AVSF, 2013). As a result, both individual women and subsequently established women-only producer associations gained in autonomy, both at the farm level and in terms of decision

² Lead firms (either in intermediary or final markets) are companies that determine the governance structures of the value chain, guided by rules and requirements which impact the access of small-scale producers to markets.

BOX 10 Animal disease and risk management

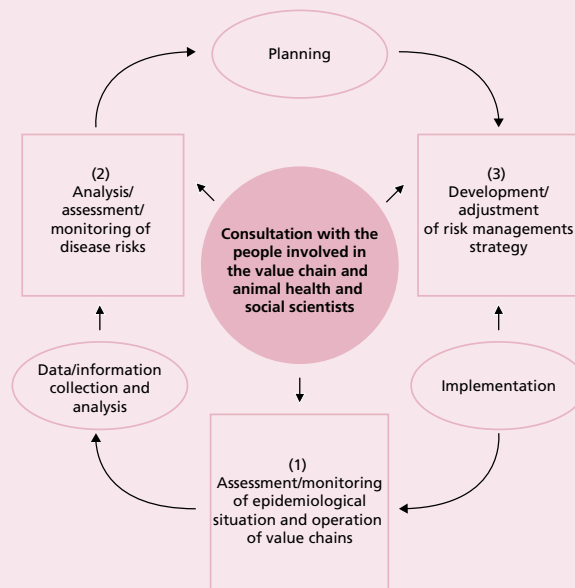
Animal disease and risk management is an essential factor to be considered in any livestock value chain. In order to address disease prevention and control in the value chain, it is necessary to:

- understand the production systems and the stakeholders involved (their perception of the risk, incentives and capacities etc.) – i.e. **value chain analysis**;
- evaluate the risks of disease within the livestock production systems, and design measures to mitigate these – i.e. **risk analysis**.

A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application (FAO, 2011), combines these two elements into a practical and useful approach to planning for disease prevention and control measures.

The value chain approach provides a framework for interdisciplinary collaboration to assess disease risk, identify hotspots and design animal disease management. Users must evaluate opportunities for disease transmission, risk reduction and compliance practices, and understand the resources, incentives and capacities of stakeholders for disease risk management throughout the chain.

Cyclical disease risk management



If the focus of the intervention (e.g. as determined in Step 1.1 on p. 31) is solely on animal health, the VCA should focus on elements that are critical in disease risk management.

FAO. 2011. *A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application*. Animal Production and Health Guidelines, No. 4. Rome, FAO (available at <http://www.fao.org/3/a-i2198e.pdf>).

BOX 11

Lessons learned on governance in Kenyan poultry systems

The Kenyan poultry industry comprises large- and small-scale producers commercializing improved chickens or indigenous poultry. A series of focus group discussions and interviews with various actors, including farmers, commercial companies, input sellers, processors, retailers and other intermediaries, illustrated the heterogeneity of Kenya's poultry-sector value chains. Various lessons emerged in terms of governance and transaction rules for those value chains:

- Small-scale farmers were rarely considered the dominant actors in value chains. There was a lack of formal transaction rules and modalities; furthermore, prices were essentially determined by brokers. Where small-scale farmers did exist, marketing activities were mostly handled by farmers' associations that sometimes helped negotiate better prices. The absence of farmers' associations in some areas was sometimes put down to lack of trust and communication.
- An integrated value chain involving broiler companies was described as governed by formal rules, for example, with regard to the supply of day-old chicks or the provision of veterinary care. Broiler companies were identified as the dominant actors in this particular chain. The chain submitted to government inspection regarding, for instance, bird movement permits and meat export certificates.
- Market actors identified not only brokers and broilers companies as dominant in the value chains, but also government sanitary inspectors and city council officials, since fees were collected for waste collection and water supply. Traders' associations were in place to negotiate marketing and administrative matters.
- Public policy and regulation – mostly relative to hygiene, biosecurity and export permits – was felt at various levels of the value chains, but was generally absent outside the more formal chains and components.

In conclusion, there are major differences in structure, governance and regulation depending on the value chain considered. In order to increase food security and reduce poverty among small poultry producers, critical points were identified: involvement of small producers in policymaking; formalizing of value chains; and strengthening of associations.

Source: Okello *et al.*, 2010; Carron *et al.*, 2017.

making throughout the value chain, with favourable changes in slaughtering practices and marketing of the products.

The governance structure also helps to identify leverage points for intervention: pinpoint nodes or lead firms, where intervention will have a multiplier effect due to business linkages and outreach.

As a value chain evolves, it becomes more complex; relations between actors become closer because collaboration is required to ensure a reliable supply of quality products.

Cooperation is particularly important in relation to issues such as traceability or food safety, which require that products are identifiable at each step of the chain.

Figure 13 depicts the spectrum of governance structures, with varying degrees of coordination. The **market-based system** is a loose one: transactions are simple – generally spot deals – and price is the defining factor. This situation is an example of “atomistic pricing”, where there are multiple buyers and sellers of a generally uniform product. In such a system, small-scale livestock producers are often at a disadvantage when bargaining with traders, since the latter tend to be better informed. This is especially true of pastoralists, whose mobility may limit their access to the latest information on market prices, although the use of cell phones presents increasing opportunities to improve this access.

The **balanced system** has a tighter, more coordinated governance structure with for instance prices negotiated between buyers and farmers organizations; the buyer exerts more power, but the producers are more organized (e.g. through collective action).

The **directed governance system** usually entails contract mechanisms and partnerships, with small-scale producers supplying one or more buyers. The smallholder thus has control of a particular market channel and its requirements. Embedded services are provided to small-scale producers, increasing the quantity and quality of their production.

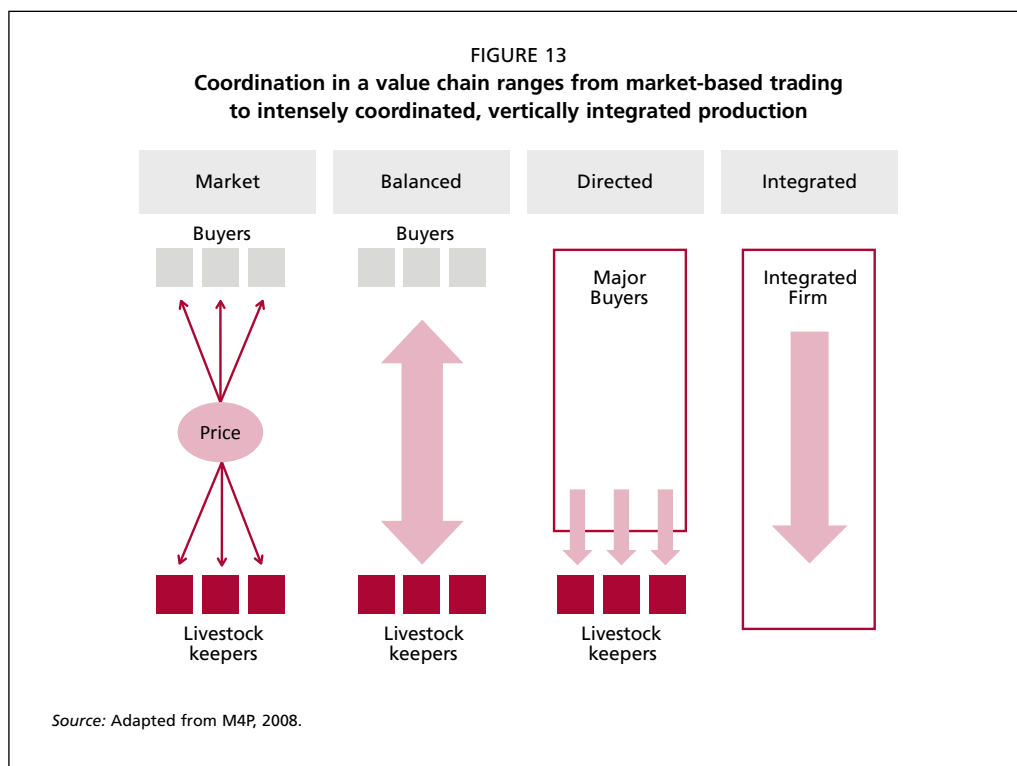
In **vertically integrated** value chains, the lead firms have strong influence across much of the value chain. For example, a poultry company may control all stages of a chain from production of parent stock and feed milling, to hatchery operations, fattening, slaughtering, all the way down to the retail outlets where the product is sold. This structure not only ensures product quality and reliability of supply, it provides secure employment. However, there is little scope for small-scale producers, unless they are included in an outgrower scheme (similar to the directed system).

If small-scale livestock producers are to benefit from participation in the market, **governance structure is key** and involves:

- finding out how the value chain is coordinated, including key actors, firms and mechanisms (namely contracts, agreements, services), and determining the dynamics involved and why these relations and mechanisms exist;
- exploring the formal and informal rules, regulations and standards that influence the value chain, and what incentives exist to ensure compliance. How are regulations enforced? What rewards and sanctions are in place to ensure compliance?
- examining the effects of the governance structures (and rules and requirements) on livestock producers. What are the constraints (e.g. lack of information, lack of organization among producers, lack of capacity) limiting their participation?

Producer organizations strengthen horizontal cooperation: livestock producers become empowered, increasing their participation and influence in the value chain. **Farmer organizations** help reduce transaction costs through economies of scale, increase bargaining power, and are a good leverage point for embedded services and capacity development. Similarly, at the meso and macro level, **professional and industry associations** further strengthen the organization of small-scale producers and facilitate policy dialogue (see Step 4.2 on p. 80).

The identification of a **champion**, a dedicated individual, group or organization that will **provide leadership for innovation and trust building** in further value chain development work (including after the end of a given project) may play an important role in the



governance of the value chain. Champions are often private partners, but they can also be from the government, NGOs or a research institution. When coming from the private sector their participation sends the message that the marketplace is strong enough to merit engagement and innovation, while the risks are manageable (USAID, 2008). The absence of such champions is often a key reason that value chain development projects fail. On the other hand, champions can also lead an enterprise off in the wrong direction and the loss of a champion, for whatever reason, can endanger the sustainability of a value chain (LPP *et al.*, 2010).

3.3.3 Quantitative and economic analysis

During the planning and decision-making process, the value chain map is used as a basis for analysis. The map is complemented with information to help understand the current situation, assess future scenarios, and design interventions. Both quantitative analysis and qualitative statements and analysis are used to understand the value chain and develop the upgrading strategy.

The quantitative analysis can include a simple quantification of the value chain to understand the concentration or distribution of the main actors, employment, production volumes and market channels. More in-depth economic analysis entails examining cost structures and pricing, calculating value addition and margins, and understanding the distribution of benefits among actors along the value chain. The information on margin and value addition is useful for motivating and providing incentives for small-scale producers.

As with qualitative analysis, users can also “zoom in” and focus on particular areas/bottle-necks along the value chain.

Quantitative analysis of the value chain

The quantitative analysis of the value chain has multiple functions:

- Enables the user to better understand the value chain and its dynamics. At what stage is employment generation greatest? How many small-scale producers are producing livestock and in what volumes compared with commercial farms? Through what market channel is most of the product flowing (local markets or rural wholesale)?
- Forms the basis for further analysis (e.g. competitiveness) of the value chain, its economic efficiency, the distribution of benefits (through margins and profitability analysis) etc.
- Allows the user to identify leverage points for intervention, and/or problem areas at particular stages of the chain that may require further analysis.
- Provides baseline data for monitoring and evaluation purposes.

Quantification of the value chain map offers both a static depiction of the current status quo (see Figure 14) and a dynamic depiction of the value chain through trends and growth rates at each chain link. Examples include:

- numbers of small-scale livestock producers, pastoralists and commercial farms (data to be gender-disaggregated where possible);
- employment along the value chain (data to be gender-disaggregated where possible);
- output value (see Tip 2) and volumes (factoring in food losses and waste);
- percentage of volumes flowing through each channel;
- prices paid for products at each stage of the chain; and
- growth rates in production volumes over time for each stage of the chain.

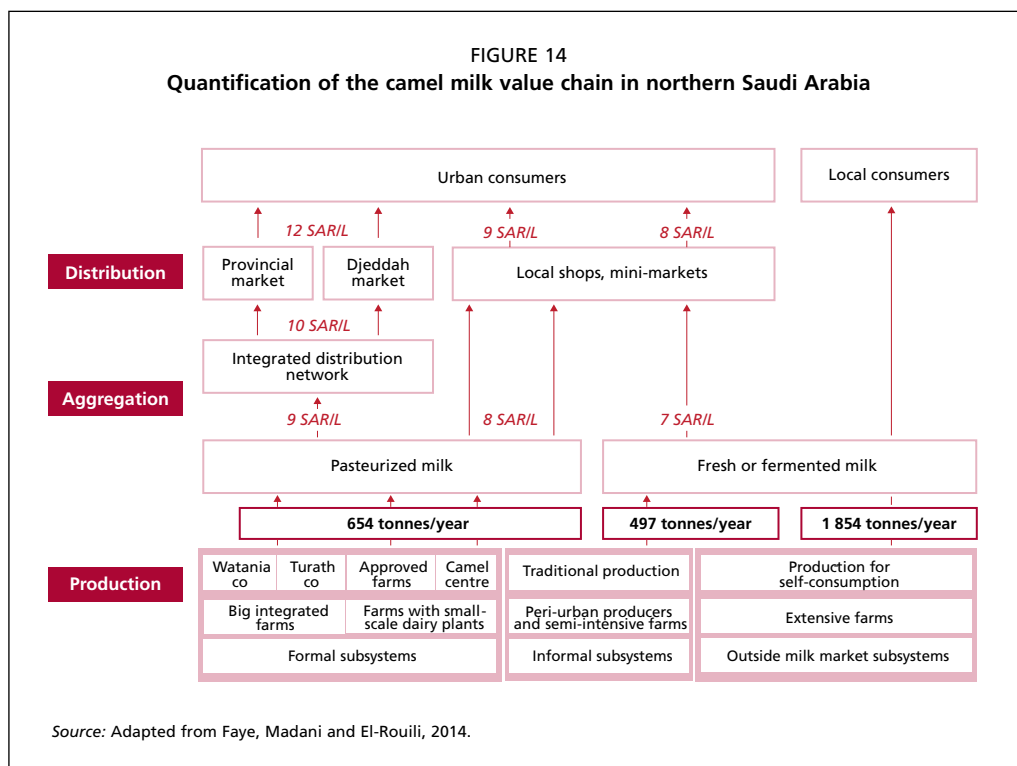
TIP 1

Quantitative data

The quality of the quantitative analysis depends on the availability of **reliable and comparable data**. This is a challenge for small-scale livestock producers: they lack market orientation and data on cost factors of production; and they tend to underestimate outgoing costs (e.g. due to failure to allow for family labour costs/opportunity costs).

The economic analysis involves the calculation of the average and variations (among producers and over time) of costs and gains. It may be necessary to factor in shortcomings, rely on estimates or proxy data, or use a sampling of small-scale producers as representative of the target populations.

Note: The economic analyses and recommendations are as good as the data they based on.



Economic analysis

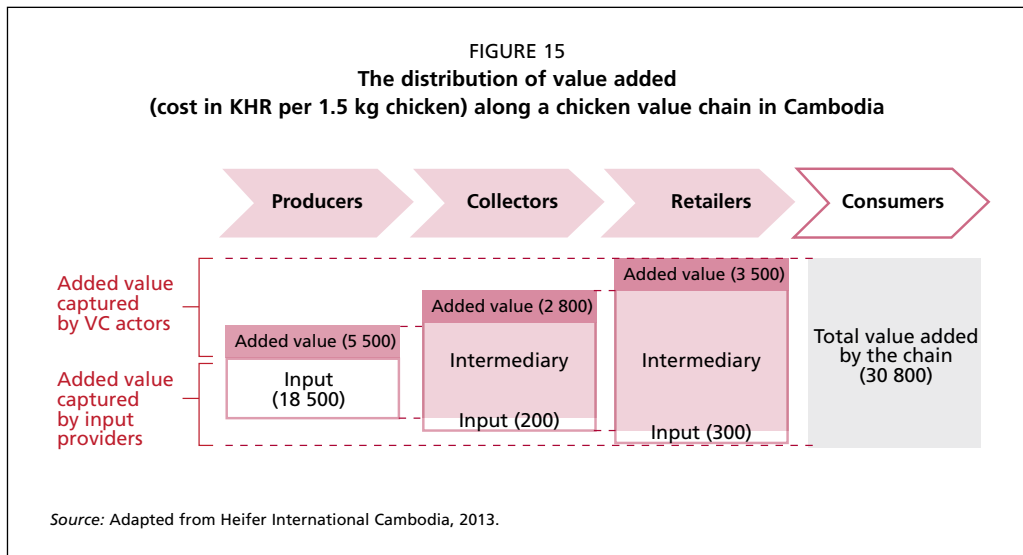
The economic analysis examines the economic efficiency of the chain. It can include an analysis of the value added, costs, profits and margin distribution across the chain, as well as of capacities and productivity. The user should note that quantitative analysis is not a static process. On the contrary, it is a **dynamic process** with variations depending on factors such as seasonality. The economic performance of a chain can be benchmarked by comparing with competing chains for export markets (GIZ, 2016) and with average industry performance and cross-industry benchmarks.

Value added

The calculation of value added is central to the value chain framework and entails the measurement of wealth created in the value chain. The main objective of the value chain is to effectively capture value in the end-market, thereby generating increased profits.

Value added can be calculated for the overall value chain; alternatively, it can be broken down for each actor and at each stage of the chain. Value can be added to a livestock product in various ways – processing intermediate products, transporting them (increasing value over space) or storing them (increasing value over time).

The value added elaborated in the SFVC framework has five components (employee salaries, net profit for asset owners, taxes, consumer surplus, positive or negative externalities – see Figure 5 on p. 19). The externalities, consumer surplus and tax revenues may be more difficult to factor into calculations in less formal economies.



The distribution of the value added (relative to the price and turnover of goods in comparison to the input provided) is key. In Figure 15, it appears that producers capture the highest share of value added; however, the reality is that collectors and retailers together capture in one day the equivalent of what producers capture in five months, with minimal inputs compared to producers.

When analysing value added in sector development strategies, it is important that the value chain capture a large percentage of the total in-country or in-region value added; distribution of these benefits must be equitable. It is also important to understand value creation along the value chain and to design interventions accordingly – for example, by reducing costs or by increasing quality to raise prices.

In Cambodia and Viet Nam, for example, a project aimed at improving pig meat marketing chains through strengthened producer cooperatives sought to enhance pig quality through swine breeds, feed supplements and collective purchasing. This resulted in higher-value contracts and hence greater value added captured by small-scale producers (Agropolis, 2010).

Small-scale producers can reduce production costs by growing their own forage, thus saving on feed purchases and capturing more of the value added of their products.

Production costs, profit margins

Analysis of value added looks at the value chain from a macroeconomic perspective, and includes aspects such as taxes and externalities. On the other hand, an economic analysis of production costs, profits and margins focuses on the direct operations of the value chain actors and on the distribution of income and margins along the chain. This affects the overall competitiveness of the value chain and, like value added, allows the user to look at distribution along the segments of the chain.

The **cost calculations** take into account both variable and fixed costs. Variable costs include the cost of improved breeds, feed, veterinary drugs, hired labour and machinery;

BOX 12 Food loss and waste

In developing countries, food losses generally occur at the stages before consumption. This is especially true for the dairy sector (with losses running at 20–25 percent in developing regions), where by far the greatest losses occur at the local and aggregation/distribution stages, frequently because of the absence of a proper cold chain. Much food is also lost at the animal production stage. The meat industry is estimated to account for more than half of the 30 percent total food losses in sub-Saharan Africa.

In a given value chain, once food losses have been identified as an issue, it is useful to quantify them at different stages of the value chain and target interventions accordingly.

For example, a study on a dairy cattle milk supply chain in Turkey helped quantify losses at each point in the chain and identify the main causes. The greatest losses occurred at the production stage: animal disease – due to poor health practices in small family farms – was the main cause.

Stage in the supply chain	Losses and waste	Notes
Agricultural production	10%	Animal diseases Poor barn conditions Uninformed feeding practices in small-scale enterprises Mastitis, which derives from uninformed operation of milking machines Uninformed milking practices
Storage	1%	Improper cooling tanks Not using milk cooling tanks to avoid high energy costs Not observing cold chain rules during transportation Transport over long distances
Processing and packaging	1.5%	Losses from not using whey from processing in small-scale enterprises Losses emerging from failures in filling/packing machines
Distribution	6%	Losses from not observing cold chain rules
Consumption	1.5%	UHT milk and white cheese suffer the most waste due to improper storage and conservation
Total	20%	

Source: FAO, 2011b; FAO, 2013b.

fixed costs include rent, interest, other financing charges and administrative costs. Other costs include transaction costs and regulatory costs (e.g. business registration). Cost calculations allow users to understand the cost structure and drivers (e.g. food losses, underused capacity), and to address production efficiencies and cost reductions.

This information can also be used in benchmarking and for comparison between the cost structure of the (sub)sector and the cost structure of direct competitors.

TIP 2 Output value

In the livestock sector, as in other agricultural sectors, value generated as output includes:

- value of products sold to the market(s);
- value of products consumed (own final consumption) or gifted;
- value of stock of products (inventory) for future sale or own consumption at the end of the period, net of stock at the beginning (change in inventory).

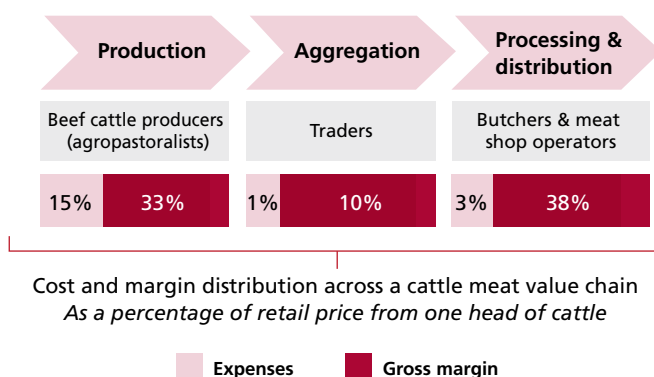
To calculate the total output value, **all three values should be considered** to determine how much is actually produced over a period. Looking only at sales is not enough.

For **profit margins**, the price per unit and the related cost structure are considered to calculate the margin distribution along a value chain. For example, in Figure 16 the profit margins are distributed, through a cost gross margin analysis, as a percentage of the retail price of the product. Net profit also takes into account non-operating expenses, such as one-time veterinary costs. The example in Figure 16 provides a distribution of profits among producers, traders and retailers.

Other economic analyses

- **Productivity analysis** – examines how efficiently resources (factors of production, e.g. land, pastures, fodder/forage, labour) are utilized in the production process. It can be used to measure one production system against another (e.g. grazing and

FIGURE 16
Example of the margin distribution in a given value chain



Source: Adapted from Kadigi et al., 2013.

foraging livestock vs zero-grazing). Productivity analysis is also useful for benchmarking against competing value chains.

- **Pre- and post-harvest loss and waste factors** – the wastage and losses experienced along the different stages of the value chain are used to help understand where the losses take place in order to design appropriate strategies.
- **Benchmarking** – compares the selected value chain with an industry average or competitor's best practice to help identify development needs and potential. Benchmarking can use numerous economic parameters (e.g. productivity, production capacity, costs structure, growth rates, investment) as well as qualitative factors (e.g. technology and innovation, research, staff training, existence of market regulations and sanitary and phytosanitary standards).
- **Transaction cost analysis** – focuses on the costs occurring in the marketing process: information costs (identifying marketing options), negotiating costs, and monitoring and enforcement costs. Transaction costs should be considered by small-scale producers when deciding on specific marketing channels (De Bruyn *et al.*, 2001; Ndoro, 2015).
- **Cost-benefit analysis** – used for reaching decisions, evaluating trade-offs and understanding certain aspects of the value chain (e.g. the cost-benefit ratio of various production systems). Analyses can be kept simple; alternatively, they can be complex and comprehensive, capturing economic, social and environmental benefits (e.g. income, nutrition and contribution to ecosystem services, respectively) or factoring in livestock diseases and pests as an important externality cost to communities and countries. Cost-benefit analyses can be used to evaluate different intervention options when designing development strategies.

An important aspect of the dairy and egg sector lies in the fact that it is a regular, sometimes daily source of cash. In contrast, in crop systems, farmers generally do not get paid until after harvest. Milk production therefore helps diversify income and stimulates cash flow (Henriksen, 2009).

3.3.4 Sustainability

Sustainability is central to the SFVC concept and addresses all three of its dimensions: **economic, social and environmental**. Throughout value chain development, it is important to adopt a holistic approach to sustainability of the value chain and its interventions. The three dimensions are mutually reinforcing: for example, environmental sustainability is necessary to ensure long-term competitiveness and economic growth. However, trade-offs between the dimensions also need to be considered: for example, livestock activities generally have an impact in terms of greenhouse gas emissions and carbon footprint, but an integrated farming system is more environmentally friendly. Likewise, use of antimicrobials involves a risk of promoting drug-resistant pathogens, but is beneficial to human and animal health. Various tools are available to evaluate the performance of value chains in terms of sustainability, especially the environmental dimension. They include life cycle assessment (LCA), which calculates the environmental impacts associated with all the stages of a product's life (see Annex 2).

- **Economic sustainability**. A value chain needs to be commercially viable, competitive and with potential for growth in order to ensure sustainable economic impacts, such

BOX 13

HACCP in livestock value chains

The Hazard Analysis Critical Control Point (HACCP), an approach developed to ensure hygiene and food safety, deals with the identification, evaluation and control of biological, chemical and physical hazards throughout the food production chain. It is based on seven principles:

1. Identify the potential hazards associated with food production at all stages, from growth, processing, manufacture and distribution to the point of consumption. Assess the likelihood of occurrence of the hazards (**risk assessment**) and identify preventive measures for their control (**risk management**).
2. Determine the points, procedures and operational steps that can be controlled to eliminate the hazards or minimize the likelihood of occurrence; these are the **critical control points (CCPs)**.
3. Establish critical limits that must be met to ensure that the CCPs are under control.
4. Establish a system to monitor control of CCPs.
5. Establish corrective action to be taken.
6. Establish verification procedures.
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

HACCP systems rely on certification provided by an independent certifying body, which ensures that adequate procedures are applied to guarantee food safety along the chain. Compliance is mandatory in most export markets.

Food safety and hygiene are important concerns for livestock products, especially in developing countries, in the areas of transport, slaughtering, cold chains and zoonotic risks. HACCP can easily be applied alongside a VCA, as it has similar requirements in terms of the characterization of activities and stakeholders along the chain and the interventions to be implemented (development of a legal framework, capacity building etc.).

The HACCP approach is of particular relevance to livestock value chain projects focusing on food safety.

Source: FAO, 1998.

as increased income, employment, taxes and food supply. Factors contributing to economic sustainability include:

- growth forecasts in the end-market;
- entry into new markets and/or niche markets;
- competitiveness of the value chain relative to rivals and possible substitutes;
- successful branding of the product; and
- job creation.

BOX 14

Gender considerations

The livestock sector is characterized by gender differences. Upgrading strategies must reflect the differentiated roles and dynamics and be able to deal with the ensuing challenges. Gender-based constraints (GBCs) can be defined as “restrictions on men’s or women’s access to resources or opportunities that are based on their gender roles or responsibilities” (USAID, 2009). These constraints may regard lack of access to financial services, or specific gender-differentiated roles within the sector. For example, in sub-Saharan Africa, milking is traditionally the responsibility of women, whereas selling or slaughtering dairy livestock is undertaken by men.

Two guidelines, *Understanding and integrating gender issues into livestock projects and programmes. A checklist for practitioners* (FAO, 2013) and *Developing gender-sensitive value chains: a guiding framework* (FAO, 2016), have been developed to identify and analyse GBCs, enabling value chain practitioners to resolve inefficiencies related to gender inequalities and discrimination, and thus enhance the sustainability of interventions.

FAO. 2013. *Understanding and integrating gender issues into livestock projects and programmes. A checklist for practitioners*. Rome, FAO (available at <http://www.fao.org/3/a-i3216e.pdf>).

FAO. 2016. *Developing gender-sensitive value chains: a guiding framework*. Rome, FAO (available at <http://www.fao.org/3/a-i6462e.pdf>).

USAID. 2009. *Promoting gender equitable opportunities in agricultural value chains*. Washington, DC.

Livestock contribute to producers’ economic sustainability through:

- their role as a financial asset that can be converted into other valuable commodities when needed, or used as collateral for finance; and
- diversification of activities and livelihoods to improve the economic (and environmental) resilience of farmers (i.e. livestock are a financial asset).
- **Social sustainability.** For the value chain to be socially sustainable, and to ensure that economic growth is inclusive, equitable and with positive social impacts, the following factors need to be considered:
 - inclusiveness of growth;
 - equitable distribution of benefits;
 - right to food, food security and nutrition;
 - empowerment of women, young people and disadvantaged groups;
 - resolution of potential conflicts, including land tenure issues;
 - promotion of workers’ rights and occupational safety and health; and
 - promotion of animal welfare.
- **Environmental sustainability.** The growth of the livestock sector should take place without depleting natural resources. Livestock production systems tend to interact strongly with their environment on different levels:
 - Livestock externalities may have different negative impacts on their environment (water, land, soil, air and biodiversity degradation).

BOX 15

Climate-smart livestock value chains

Climate-smart agriculture (CSA) aims to address food security and climate change by: (i) sustainably increasing agricultural productivity and incomes; (ii) adapting and building resilience to climate change; and (iii) reducing and/or removing greenhouse gas emissions where possible. Within the livestock sector, there is substantial scope for climate change mitigation and adaptation. Interventions are possible – at the production stage and along value chains.

Interventions at the production stage:

- Improved resources management (water, land, feed etc.).
- Optimization of grazing by balancing and adapting grazing pressures on land (improved carbon sequestration and lower carbon emissions).
- Improved waste management (e.g. storage and use of manure as an energy source).
- Adapted breeding – prioritizing efficiency (relative to carbon emissions) and/or tolerance to heat, poor nutrition, parasites and diseases.
- Improved herd management, disease control and feeding strategies.
- Diversification of activities and integrated management.

Interventions along value chains:

- Reduction in dependency on inputs (feed, vaccines etc.).
- Reduction in food losses and waste at the different value chain stages (e.g. transport, storage, packaging and retailing).
- Reduction in GHG emissions related to transport (local consumption).
- Matching of supply with demand (i.e. reduce oversupply) and improved market access.

In general, the main barriers to the adoption of CSA practices relate to a lack of information, limited access to technology and insufficient capital. Overcoming these barriers requires interventions involving capacity building and extension work, as well as appropriate financing mechanisms.

Source: FAO, 2017c.

- The livestock sector is estimated to produce 14.5 percent of global greenhouse gas emissions. On the other hand, livestock systems make use of a significant amount of foods that are inedible for humans.
- Livestock production may be affected by increased extreme climatic events (droughts, floods etc.), changes in feed and water availability, and the emergence of new zoonotic diseases.

BOX 16
Land tenure issues

Most livestock systems, especially pastoral ones, rely on land for grazing, feed production and herd movements. In order to address the uncertainty and heterogeneity of land resources, small-scale producers seek common solutions such as herd mobility or communal tenure practices.

However, there are numerous **challenges regarding land tenure**, for example:

- conflicting interests over the use of land and related resources;
- lack of integrated land-use planning on different scales;
- weak institutional relations between states and pastoral communities;
- absence of participation mechanisms for pastoralists; and
- absence of a legal framework for pastoralism.

In the context of value chain development, land tenure and access to land are important issues in non-pastoral as well as pastoral areas. Since land availability often determines feed availability, problems concerning land access can limit production by small-scale herders.

It is important to **determine to what extent land access constrains livestock production**. Aspects to be examined include:

- governance of organized rangelands;
- local and communal practices;
- relevant land policies;
- land-user rights; and
- delineation and protection of rangelands. Other aspects may emerge in relation to the existence of protected areas or to the access of women or landless people to grazing areas.

Source: FAO, 2013c; FAO, 2016a.

- Livestock provide important and diverse ecosystem services (see Box 17). Some ecosystem services can be linked to social or economic sustainability.

All these factors must be taken into account in the VCA, while the following aspects also need to be investigated:

- Positive or negative impact of value chain activities on the environment, i.e. input production, trade, livestock production, processing. Impacts may include pollution of water resources, land and soil degradation, interaction (positive or negative) with wildlife, but also maintenance of pastoral areas and supply of organic fertilizers for crop production.
- Short and long-term access to environmental resources by value chain actors.
- Participation of livestock in recycling of waste and crop residues.
- Vulnerability and potential resilience of the value chain towards extreme climatic events (droughts, floods etc.).

BOX 17

Livestock ecosystem services

Livestock play an essential role in the provision of ecosystem services. They have a unique ability to convert non-human edible feed and organic waste into useful products. Further, livestock have direct interaction with ecosystems (e.g. land, vegetation and soil) through trampling, grazing and browsing, and manure production. Finally, their mobility enables them to respond to fluctuations in the availability of ecosystem resources (whether temporal or spatial). Therefore, ecosystem services should be integrated into value chains – not only to ensure the long-term availability of those services, but also to increase the revenues of the service providers involved (e.g. through market-based instruments such as certification schemes).

The following ecosystem services categories may be considered:

- provisioning services – providing materials obtained from ecosystems (e.g. food, fibre, skins, fertilizer, fuel, animal power, genetic resources);
- regulating and maintenance services – gaining benefits from the regulation and maintenance of ecosystem processes (e.g. waste recycling, conversion of non-human-edible feed, prevention of land degradation and erosion, water quality and flow regulation, avalanche and fire control, maintenance of life cycles of species);
- cultural services – gaining non-material benefits from ecosystems (e.g. spiritual enrichment, cognitive development, reflection, recreation [eco-/agro-tourism], aesthetic experiences, cultural and historic heritage, natural [landscape] heritage).

Although the market system does not generally capture non-provisioning ecosystem services, they may be important for value chain actors and should be taken into account in the analysis of value chain sustainability.

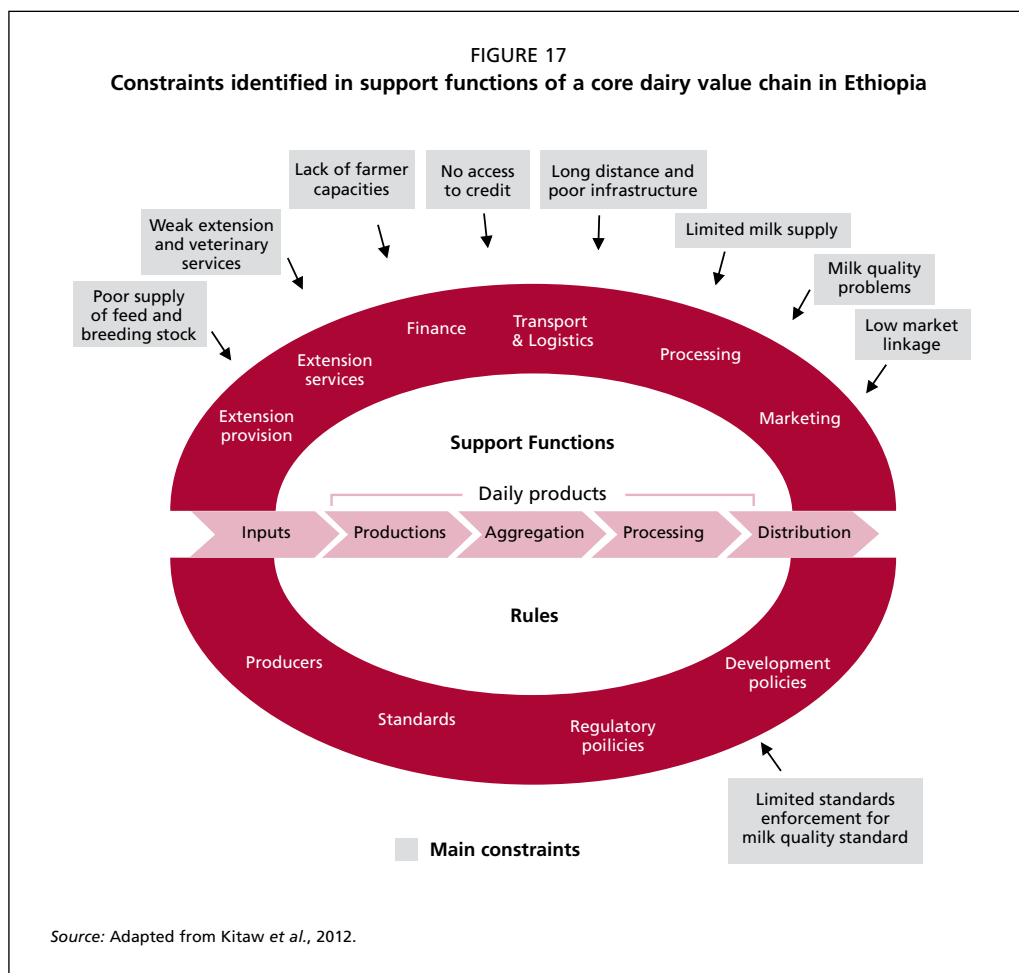
Source: FAO, 2014b.

- Geographically-specific environmental values and their potential interactions with livestock activities.
- Specific adaptive capacities of local breeds.

3.3.5 Market systems analysis

A value chain is made up of a range of different market systems: intermediary markets, input markets, financial markets and other service markets. Each market system has support functions and its own informal and formal rules, which together form the enabling environment and overall governance structure. Figure 17 shows the constraints identified in the support functions and rules (governance and enabling environment) of a dairy core value chain that can be analysed for a specific market system (Figure 18).

The core market is connected to the support markets and the enabling environment. Therefore, the cause of a problem in the core market may lie in one of the subsystems.

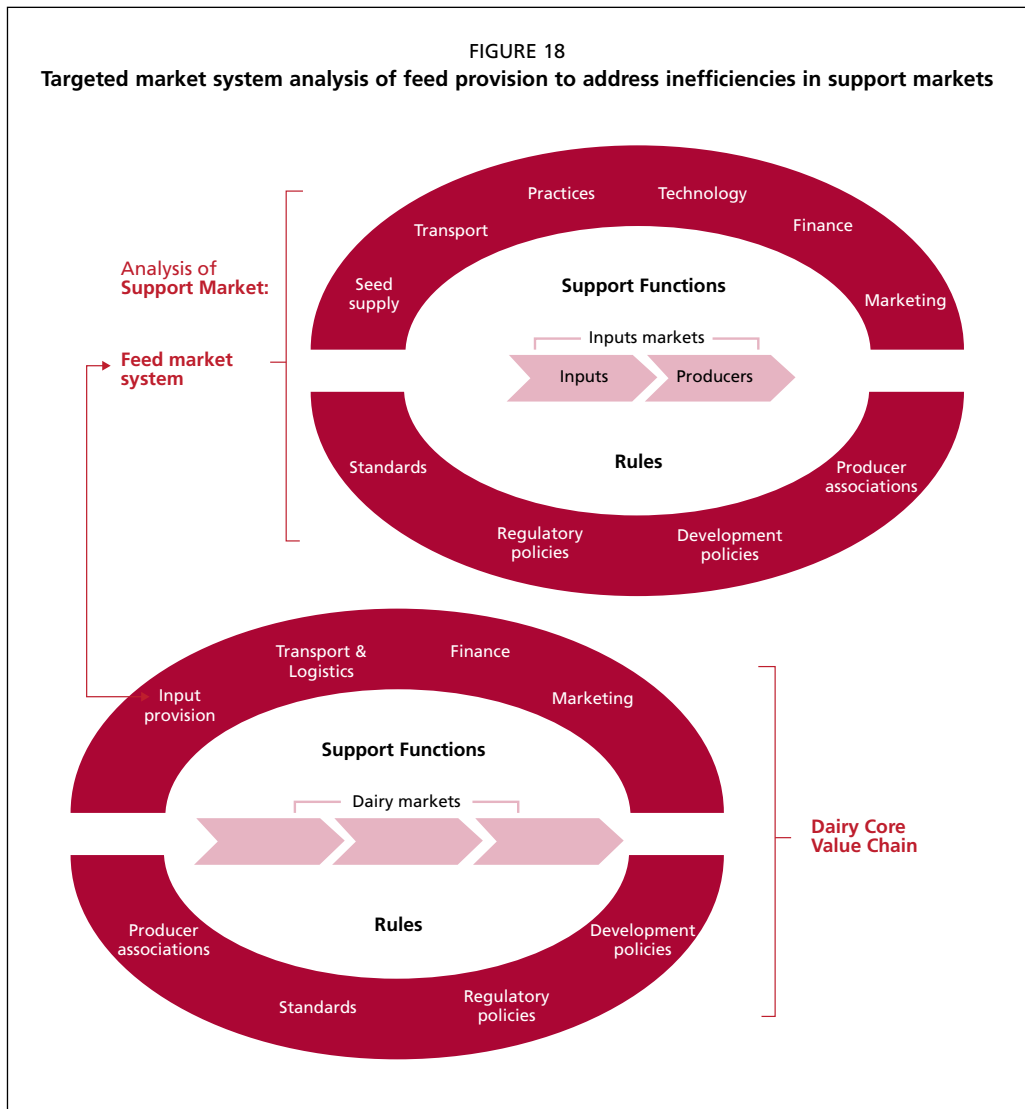


Market systems analysis enables us to look at both core markets and subsystems to identify the root cause of any challenge.

For this reason, an intervention in the core value chain – for example, to improve the chain’s performance or efficiency – may have a limited effect unless related market inefficiencies are also addressed.

For example: in the dairy value chain in Figure 17, the problem of limited milk supply can be resolved by improving smallholder productivity. One solution is to introduce better breeding stock. However, for high-productivity dairy crossbreds to express their full genetic potential, it is then necessary to improve feed supply (an input market issue). In brief: isolated interventions have limited – or even negative – effects, in terms of costs/revenues.

Market system analysis is used to understand the governance system of a value chain and identify **leverage points** in the system. It is necessary to target points that can bring broad change to the value chain as a whole. These can be tangible, such as organizational nodes (e.g. producer associations), or intangible, such as economic incentives (e.g. payment of a premium for improved milk quality).



It is important to determine the relations and interdependence between constraints, and then to prioritize and sequence them. In the example above (Figure 17), to resolve the issue of limited milk supply, feed improvement should take place before breed improvement, taking into account the feed market system in its entirety (Figure 18).

3.3.6 Strategic analysis

A strategic analysis of the value chain entails conducting a SWOT analysis of the entire chain, or of one or more segments. The SWOT analysis assesses the chain's internal strengths and weaknesses; the external opportunities and threats influencing its competitive advantage; and its potential for sustainable, inclusive growth. Table 6 sets out the framework to be used, and Table 7 provides an example of a SWOT analysis.

TABLE 6

The SWOT analysis framework

Strengths	Weaknesses
<p>Key internal resources and capacities, which give the value chain its competitive advantage (e.g. availability of quality raw materials, proximity to markets, particular skill sets):</p> <ul style="list-style-type: none"> • Unique selling propositions (USPs) • Resources, assets, people • Experience, knowledge, data • Financial reserves, likely returns • Marketing – reach, distribution, awareness • Innovative aspects • Location • Price, value, quality • Accreditations, qualifications, certifications • Processes, systems, IT, communications • Cultural, attitudinal, behavioural 	<p>Lack of key internal resources and capacities (e.g. technical expertise, road access, veterinary support):</p> <ul style="list-style-type: none"> • Insufficient reputation, presence and reach • Limited financing • Own known vulnerabilities • Timescales, deadlines and pressures • Cash flow, start-up cash-drain • Continuity, supply chain robustness • Effects on core activities, distraction • Reliability of data, plan predictability • Morale, commitment, leadership • Accreditations • Processes and systems • Absence of cold chains
Threats	Opportunities
<p>Factors external to the value chain that represent a threat to profits and growth:</p> <ul style="list-style-type: none"> • Political effects/Legislative effects • Environmental effects • IT developments/Competitors' intentions • Market demand • Competitors and potential substitutes • New technologies, services, ideas • Vital contracts and partners • Sustaining internal capabilities • Loss of key staff • Sustainable financial backing • Economy – home, international 	<p>Factors external to the value chain can be opportunities for profit and growth, such as an emerging niche market or interested lead firm(s):</p> <ul style="list-style-type: none"> • Market developments/Competitors' vulnerabilities • Industry or lifestyle trends • Technology development and innovation • Global, regional and local influences • New markets, vertical, horizontal • New USPs • Tactics – surprise, major contracts etc. • Business and product development • Information and research • Partnerships, agencies, distribution

The SWOT analysis should be subdivided according to the issues considered relevant to the VCA. For example, it may include elements of the extended value chain and enabling environment (production, processing, marketing, policy) (see Table 7), and/or consider thematic issues specific to the focus of the project (quality, nutrition, climate, gender and minorities, animal breeding, feed, food safety).

The strategic analysis should also capture the **dynamics** of the value chain and factors influencing it. This can include changes in the end-market, such as consumer preferences and market demand, or changes in the flow of the value chain, such as technology and innovation, lead firm behaviour, new services or inputs, and overall rules and regulations. Capturing these dynamics is important in order to understand the adaptability of the value chain and its strategic implications.

TABLE 7

Example of a SWOT analysis for a Tanzanian dairy value chain

Strengths	Weaknesses
<p>Production issues</p> <ul style="list-style-type: none"> • Keeping animals is a traditional activity in Tanzania, people receive no specific training • Land for dairy production is available in many parts of Tanzania • The number of animals is high, third highest in Africa • Some parts of the country are excellent for dairy production (e.g. in Tanga, there is good rain all year round and enough grass available) • Producers have assured regular incomes throughout the year although margins are small • Powerful tool for rural development as incomes can be generated in poorer parts of society on a regular basis in most of the country <p>Marketing issues</p> <ul style="list-style-type: none"> • Huge market for dairy products in Tanzania and in the region • Consumer awareness is high in some parts of the country • Quality issues • Exceptional nutritional value of milk for food security • Policy issues • There is political will to support agriculture in general 	<p>General issues</p> <ul style="list-style-type: none"> • There is no proper vision for value chain development • Lack of investment along the entire value chain • Poor value chain management and coordination • No clear division of roles along the chain, too much integration by actors • Too many actors in the chain <p>Production issues</p> <ul style="list-style-type: none"> • Inability to absorb all milk during peak production • Feed costs are very high in intensive husbandry systems, lowering milk profits <p>Processing issues</p> <ul style="list-style-type: none"> • Low storage capacity in the market in Dar es Salaam • Qualified dairy specialists and technicians not available • Poor milk collection systems, few cold chains • No suppliers of dairy equipment and packaging materials in Tanzania <p>Marketing issues</p> <ul style="list-style-type: none"> • Population not educated to the value of milk • No promotion of dairy products undertaken • Market access for producers is poor • Local market not supplied sufficiently • Tanzanian consumers prefer imported products • Low consumption of dairy products in Tanzania <p>Quality issues</p> <ul style="list-style-type: none"> • Hawkers adulterate milk and sell at the same price as processed milk • No approved milk containers are available for traders of raw milk <p>Policy issues</p> <ul style="list-style-type: none"> • Double standards, processors are controlled by authorities, but the black market is not

(cont.)

Threats	Opportunities
<p>Production issues</p> <ul style="list-style-type: none"> • Genetic erosion of current dairy animals, and, despite efforts, the breed is not improving • Dairy research is not well developed in Tanzania and past successes have almost disappeared • High input prices • Kenyan milk collectors inflate prices and limit supplies <p>Processing issues</p> <ul style="list-style-type: none"> • At present prices, processors cannot compete with hawkers • High input prices <p>Marketing issues</p> <ul style="list-style-type: none"> • Imports of finished products are often cheaper than locally produced items • Consumption habits have changed, milk is no longer seen as an essential commodity <p>Policy issues</p> <ul style="list-style-type: none"> • Government does not see dairy as a priority sector • Too many regulatory bodies dealing with dairy sector 	<p>General issues</p> <ul style="list-style-type: none"> • Dairy sector has a huge potential for regional development • Milk is important for food security • Many dairy sector supporters are stepping up production issues • Interest in investment in animal feeds factories is growing <p>Processing issues</p> <ul style="list-style-type: none"> • Making high-value products with longer shelf life <p>Marketing issues</p> <ul style="list-style-type: none"> • High demand for dairy products • School programmes promote milk consumption • Institutional market is growing <p>Policy issues</p> <ul style="list-style-type: none"> • Political will through the “Kilimo Kwanza” agricultural transformation policy

Source: Adapted from Dillman and Ijumba, 2011.

Step 4. Vision and development strategy

This step provides practical guidance on how to formulate a specific and realistic vision and articulate a value chain development strategy and action plan together with key stakeholders and partners. The value chain **development strategy maps out the overall “game plan”**. It addresses the root causes of why value chain actors and partners do not (lack of incentives) or cannot (lack of capacities) take advantage of market opportunities. The strategy regards not only the core value chain (value chain development), but also support functions and the enabling environment (value chain promotion). Integral to the action plan strategy is how to achieve the vision and the strategy together with the partners responsible for implementation and financing. It is critical to define a clear exit strategy from the onset, including funding sources.

The VCA (Step 3) identifies the goals to be realized (vision) and prioritizes the key constraints that must be resolved in order to achieve those goals (strategy). It identifies leverage points and activities that address both the capacities and the incentives of the value chain actors. The vision and strategy are subject to the programme context (focus of programme, resources available etc.).

Once the opportunities are identified, the vision can be defined. The **strategy specifies the key objectives and the approach for achieving the vision**. The action plan makes the vision and the strategy operational; it breaks them down into individual components that can be realized by the value chain actors (facilitated by the programme). In order to achieve sustainability of interventions and ownership of the process, it is essential to identify suitable political and implementing partners. The M&E system keeps track of project performance to ensure that the intended objectives and vision are achieved.

Who should get involved?

The vision and development strategy must be discussed and validated by a panel representing the relevant individuals, organizations and institutions involved in each step of the extended value chain (from producers to consumers, including service providers) and in the enabling environment (e.g. policymakers).

4.1 VISION AND STRATEGIC OBJECTIVES

Based on the programme context and value chain analysis, the first step is to agree on the vision of the state of the value chain: how should it be defined and when should it be achieved? It is then possible to design the development strategy with the objective of

achieving this vision. This provides **strategic direction** for the value chain development, in consensus with key value chain actors and partners.

In formulating the vision, one should:

- select a time perspective – how should the value chain be in five years' time?
- be brief – one paragraph statement, if possible;
- be realistic as to what can be achieved in the time fixed;
- be sustainable and include economic, social and environmental impacts; and
- follow overall programme objectives and focus.

It is vital to involve the value chain stakeholders (from the core value chain, support functions and enabling environment) in the development and validation process. The involvement of both strategic political partners and value chain actors ensures that the business objectives are incorporated and that the political elements are included.

The programme objectives may vary. Nevertheless, the core objective (e.g. improvement of competitiveness and profitability) must be addressed and all three sustainable development dimensions (i.e. economic, social and environmental) must be developed. Competitiveness and growth in the sector (the core objective) is necessary in order to achieve the other dimensions (e.g. ensuring that the value chain is more inclusive and sustainable).

CGIAR (2016) defines its vision for small ruminant value chains in Ethiopia as follows:

By 2023, people in Ethiopia benefit from equitable, sustainable and efficient sheep and goat value chains: their animals are more productive, livestock markets work for producers, consumers and business, there are more affordable and healthier small ruminant products, and the livelihoods and capacities of people involved in the whole chain are improved.

The vision statement is followed by the **core value chain objectives** (e.g. improved competitiveness through product differentiation, cost reduction and new market channels) and the **development objectives** (e.g. access to markets for the poor, inclusive growth, and climate resilience and sustainability).

Strategic objectives should be as concrete and precise as possible. Where possible, the targets should be quantified (e.g. values and volumes to be reached, jobs to be created). The objectives are determined in accordance with the development strategy or strategies chosen. See Box 19 for an example of how vision, development strategy and action plans can be articulated.

4.2 DEVELOPMENT STRATEGY

The development strategy defines the “game plan” – **how the value chain actors, facilitated by the programme, will achieve the objectives set out in the vision.**

When designing the strategy, one or more of the following development pathways are to be considered (Microlinks, 2010):

- **Process upgrading.** Livestock production is made more efficient: costs are reduced, either through improved capacity, innovation and technologies or through improved support markets, especially input markets. This boosts the competitiveness and hence profitability of the chain as a whole and of the individual value chain actors. For example, a process upgrading strategy may increase production (e.g. through improved feeding and genetics) or reduce food loss (e.g. through more efficient transport and refrigeration).

- **Product upgrading.** The livestock product itself is improved, through enhanced quality and greater value added: processing of livestock products is supported and compliance to standards and regulations (e.g. HACCP or organic production guidelines) is promoted. This improves the added value, competitiveness and hence profitability of the whole chain and of the individual value chain actors.

For example, product upgrading strategies may improve the sanitary quality of a product or process it into alternative products (e.g. transformation of milk into cheese or other dairy products).

- **Functional upgrading.** Actors in the value chain capture more added value by moving up the value chain into production or distribution; or companies secure their supply chain (meeting stringent market requirements and standards) and integrate downstream production. This improves the governance structure and business linkages in the chain; it increases the competitiveness (and hence profitability) of the chain as a whole and of the individual value chain actors.

For example, small-scale producers may decide to handle some functions of the value chain (slaughtering or distribution) to gain more direct access to local markets and capture more of the total value added of the product.

It must be stressed that middlemen and traders may play a critical role in providing small-scale producers with access to markets, market information and even finance. Any strategy that excludes them from the value chain must be considered carefully.

- **Market upgrading.** Value chain actors access new markets and/or new market channels for the same product or improved products. Market upgrading includes both market penetration (deeper outreach) and diversification (entry into new markets).

For example, a value chain may seek to access a specific urban, export or organic market.

The above elements are not mutually exclusive; for example, market upgrading usually takes place together with process and product upgrading to meet the demands of a new market.

The development strategy defines the overall approach and the core components to be considered to achieve the vision. A more detailed action plan (breaking down the different components into tasks and activities) is then developed (Step 5).

Important factors to consider when **defining sector strategy in the action plan** include:

- **Market orientation.** Market-based, commercially viable solutions are required to: (i) promote the sustainable growth of the value chain; and (ii) address market failures limiting the growth and competitiveness of small-scale producers and micro-/small/medium enterprises. This ensures that interventions are driven by demand and result in sustainable (behavioural) change once funding comes to an end and project facilitation ceases. For example, an Ethiopian project funded by the World Bank supported private livestock input providers (feed, equipment etc.) by: (i) stimulating demand through awareness raising of improved inputs, resulting in improved productivity; (ii) improving sales networks of private companies in remote rural areas; and (iii) providing appropriate credit facilities. The provision of improved, quality inputs by the private sector compensates for limited supplies from weak government extension services.
- **Comprehensive approach.** Individual interconnected development strategies are needed along the different stages of the value chain and at its different levels (core value chain, support functions and enabling environment). The strategies address the

constraints that prevent the value chain and its actors from reaching their potential. In order to achieve the vision, it is necessary to address all identified and prioritized constraints. Furthermore, strategic interventions need to be sequenced correctly: successive interventions must build on the outcomes of earlier interventions.

For example, if a strategy aims to reach a given market, it may first require the value chain to have met market requirements in terms of traceability and food safety standards.

- **Integration of inclusive approach.** It is important to consider the potential differences in terms of capacity and needs among targeted actors, such as women and men, ethnic and religious groups, and age cohorts. Actors may require interventions tailored to their specific needs (see Box 18).

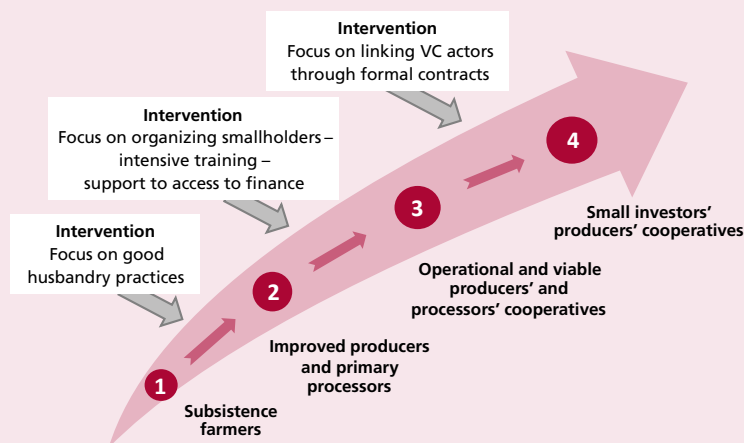
BOX 18

Transformation pathway for improved livestock productivity and commercialization

The Livestock and Fisheries Sector Development Project for Ethiopia is a World Bank project supporting livestock growth and transformation. It follows a dual approach:

- supporting immediate and long-term capacity building; and
- targeting strategic commodity value chains through comprehensive support to small-scale producers.

In order to address the heterogeneity of small-scale production in terms of capacity and development, the project developed a transformation pathway for improved livestock productivity and commercialization. This foresaw small-scale producers moving through stages to achieve goals of increased productivity, commercialization and market access in an inclusive and sustainable manner. Each stage required a set of interventions tailored to the specific needs of small-scale producers.



Source: <http://documents.worldbank.org/curated/en/392591478726570546/pdf/IITM00184-P159382-11-09-2016-1478726567434.pdf>

- **Quick wins.** A combination of long- to medium- and short-term interventions and solutions is required. This includes identification of quick wins and “low hanging fruit” – intervention opportunities that can be implemented quickly. Wins are important for projects to gain momentum and earn the confidence of value chain actors, especially buyers and political partners. These “value for money” options should be identified and pursued at the beginning of the interventions.

For example, support can be provided for easily adoptable practices, such as mineral-lick blocks for improved feeding, phone-based market information services to actors, or regular vaccination and deworming campaigns (providing such campaigns take place on an ongoing basis).

- **Leverage points.** The focus must be on leverage points to ensure maximum intervention impact. Potential leverage points include actors in the value chain with a strong influence on the growth and structure of the value chain (e.g. lead firms); organizational nodes (e.g. small-scale livestock producer organizations); and social structures (e.g. village heads – cooperation allows to gain the respect and trust of the community).

Additional leverage points are linked to the programme’s scaling-up strategy: selected partners should have a wide presence (geographically or in terms of links with other value chains and sectors) as well as a significant impact on the economy.

For example, working with business development services on business models to provide sanitary and phytosanitary standards to micro-/small/medium enterprises processors has greater outreach than working directly with the processors themselves: these services also work with processors in other geographical areas, and with other value chains and subsectors.

- **Trade-offs and linkages.** An intersectoral (inter-value chain) approach should be adopted where relevant, as small-scale livestock farmers tend to produce both agricultural and livestock products in mixed crop–livestock systems. As the farming systems are integrated, the value chain development strategy needs to consider the relations between the various stages of production and marketing in the value chain network, and the opportunity costs and trade-offs between different productions. Off-farm considerations and employment opportunities should also be integrated.

For example, in mixed crop–livestock systems, one trade-off involves the decision to use crop residues either as a feed source or as soil amendment (i.e. beneficial organic matter).

The analysis forms the basis for the design of both the strategy and the action plan. Nevertheless, constraints and bottlenecks will arise during implementation. Monitoring and evaluation is crucial for identifying these unexpected hurdles, which will need to be incorporated into the strategy and action plan. It is vital that project design, as well as implementers and development partners, have sufficient **flexibility to incorporate opportunities and challenges as they arise**.

Step 5. Design and implementation

5.1 ACTION PLAN

The action plan describes **how the strategy is to be implemented** and breaks down the various components in terms of what, how, when, who (and where). This can include interventions in: (i) the core value chain; (ii) support markets; and (iii) the enabling environment (e.g. policies, regulations, institution building etc.).

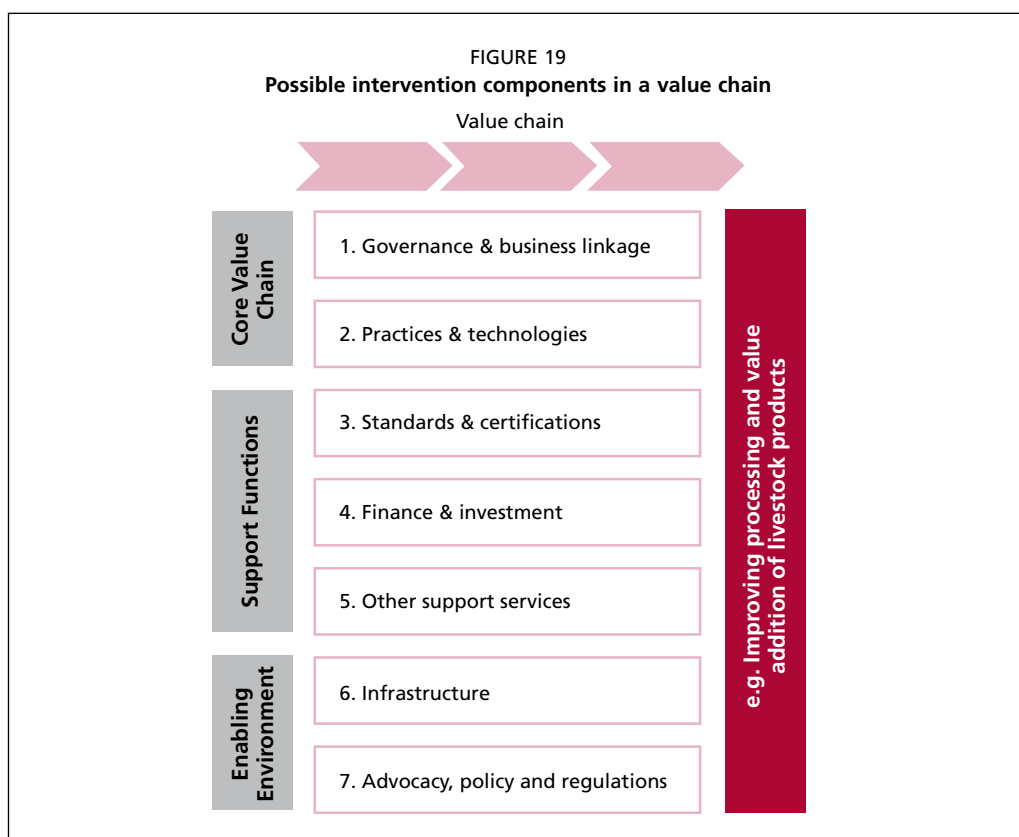
The action plan provides the details of the implementation and includes:

- **What?** Detailed description of the specific intervention (broken down into sequenced activities).
- **How?** What tools and methods are to be used to implement those activities (e.g. technical experts [internal and external], workshops and infrastructure)?
- **Milestones and (sub)indicators.** What are the direct results of the activities and how are they measured?
- **When?** When will the activities be implemented and when will milestones be reached?
- **Who?** Who will lead the implementation, and who are the implementing partners (see box “Who should get involved?”)?
- **How much?** What are the costs of the different activities (e.g. workshops, travel, workdays [technical] and infrastructure)?

Who should get involved?

In order to develop the action plan, the partners who previously endorsed the development strategy are expected to participate in the implementation of interventions (see Step 5.2). Furthermore, some service providers and resource persons with relevant technical and managerial expertise will be called in. These individuals may be actors from the extended value chain or strategic/political partners (enabling environment).

Figure 19 shows the possible components of intervention at each stage of the value chain from governance and business linkages through to advocacy, policy and regulations. In order to highlight which part of the value chain the components address, it is useful to visually superimpose the components over the value chain mapping (ensuring the map is still evident underneath). This will enable the audience (strategic partners, implementers etc.) to understand which function of the value chain is being targeted, who the responsible actor(s) for that function are, and the business linkages involved.



The intervention area in Figure 19, with its various components, is drawn from a 2012 East African Farmers' Federation (EAFF, 2012) project promoting value-addition practices for livestock products in Kenya and Uganda. The intervention area includes the following:

- **Core value chain activities:** strengthening of producer organizations (governance); capacity building; and improvement of value-addition practices and technology.
- **Support functions:** capacity building to conduct training in hygiene and handling of meat and other livestock products (standards and certification); development of cold chain and suitable transport (services); promotion of investment (services and business linkages); and provision of suitable financial facilities (finance).
- **Enabling environment:** building of slaughterhouses (infrastructure); and establishment of a suitable policy framework to promote value addition (policy and regulations).

A programme can choose to focus on one key intervention area or, more often, to cover multiple intervention areas, each with a number of components. The focus of the intervention areas is determined in Steps 1–3, in which the programme context, objectives and resources determine the scope and boundaries of interventions, and the VCA determines the key challenges and opportunities to be addressed and the resources to be mobilized.

Box 19 shows how vision and strategy are operationalized in an action plan. Tables 8–14 provide examples of interventions and Boxes 20–26 present detailed case studies.

BOX 19

More productive chickens for Africa's smallholders: an example of vision, strategy and action planning

The African Chicken Genetic Gains (ACGG) project aims to leverage existing research while implementing innovative approaches in developing and supplying genetics in country value chains. For Nigeria, the following vision, objectives and actions have been proposed:

Vision

To transform smallholder chicken production into commercially viable enterprises with active private-sector engagement that empowers rural women and increases income and family nutrition through delivery of more productive, locally adaptable chicken production inputs and services to rural communities.

Objectives

- Determine what type of genetically improved chicken breed is highly productive and locally adaptable.
- Improve supply of birds, inputs and services to rural smallholder chicken (SHC) farmers through public-private partnerships (PPPs).
- Increase production, productivity, income and household consumption of poultry products.
- Empower women (through control over resources) in the SHC value chain.

Actions to achieve developmental objectives

- Establish innovation platforms to include women and representatives of all stakeholders and actors in the SHC value chain at national and subnational levels.
- Support/create women SHC farmers' cooperatives/business hubs.
- Support/create women's business hubs of input suppliers and output buyers.
- Train required actors of the SHC value chain and innovation platforms.
- Develop learning resources (manuals, videos, online material etc.) in four Nigerian languages on chicken management best practices.
- Establish monitoring and evaluation systems for the SHC value chain and innovative platform.

Actions to achieve research objectives

- Carry out baseline survey of the status of SHCs in the five zones.
- Conduct on-station and on-farm evaluation of the genetic strains.
- Establish a sustainable data and sample collection system for long-term genetic gains evaluation.

Source: Adapted from Adeyinka and Bamidele, 2015.

5.1.1 Governance and business linkages

Strengthening governance and business linkages with a focus on business operations and commercial transactions is central to any development strategy. This includes:

- governance of the chain in its entirety;
- business linkages between different stages of the value chain (vertical business linkages);
- business linkages among actors (e.g. small-scale producers, or dairy processors' associations) at the same stage of the value chain (horizontal integration).

Governance. The overall governance structure of the chain helps the project recognize leverage points and identify where impact can be made along the value chain. This entails identifying and working with lead firms that have substantial influence over the chain, but can include other key actors, such as major suppliers and even intermediaries such as traders. Other power dynamics include influence from the enabling environment.

Vertical business linkages. Vertical linkages strengthen market access and market efficiencies and improve the distribution of benefits along the value chain. These include activities aimed at enhancing:

- communication and trust building between actors (e.g. joint field visits, facilitated negotiations, dialogue platforms);
- market information (e.g. through SMS, radio, village heads, traders, producer organizations);
- market facilitation (e.g. investment promotion, trade fairs, business matchmaking);
- linkages with small-scale producers and input suppliers/buyers; and
- inclusive business models, such as contract farming arrangements, which provide a secure market through agreed prices and volumes, and can include embedded services (e.g. technical know-how to comply with regulations and requirements).

Hence, business linkages are not limited to commercial transactions but include the flow of information, technical expertise and finance that facilitates relations.

Horizontal business linkages. Horizontal integration contributes to the empowerment of small-scale livestock producers and pastoralists. For example, the creation of farmers' groups can help tackle fragmentation of supply, which is prevalent in the sector. In addition to capacity building, it is necessary to ensure that incentives exist for collective action, as small farmers need to recognize that benefits will outweigh costs (including their time).

Collective action results in increased bargaining power vis-à-vis buyers and input suppliers, and enables small-scale producers to meet the volume requirements of large buyers and to buy inputs in bulk. Other benefits include economies of scale in shared infrastructure (e.g. storage and transport), joint collateral for access to finance, entry points for capacity building, and joint advocacy with policymakers.

As part of collective actions, professional and sector associations provide services such as policy advocacy, updated market trend information, training and skills upgrading, and investment promotion. They also act as an entry point for potential investors.

To enhance and promote governance structure, dialogue platforms have an important role – whether for the whole sector or for specific value chains or industries. Dialogue platforms strengthen dialogue and communication, and build trust among stakeholders. Targeted interventions include: establishing the platform; providing support for increased representation and association; capacity building in negotiations; facilitating dialogue and conflict resolution; and organizing business round tables.

BOX 20

Governance and self-management of cattle markets in Benin

The role of local intermediaries, known as *dilaalis*, in the management of livestock markets in Benin has been criticized on a number of grounds including lack of transparency, undermining livestock keepers' bargaining powers and preventing the collection of market fees due to the absence of records.

A Netherlands Development Organization (SNV) project helped market stakeholders in Bassila to create a new vision for the local market. A market fund was established to collect fees for every animal sold, as well as parking fees. Rather than brokering animals, *dilaalis* were now tasked with ensuring the traceability, through transparent records, of all animals sold; they supervised market transactions in their allotted areas, receiving a fixed price per head. Some infrastructure improvements were co-financed by the donor and the organization grouping the market traders, sellers and intermediaries.

As a result, livestock keepers have been empowered to negotiate the selling price for their animals directly. Management transparency and efficiency have been improved, and government taxes are now being collected by *dilaalis*. The number of animals bought and sold has increased, and the market's turnover has risen from under USD 2 600 in 2008 to over EUR 20 000 in 2011, while the number of market employees *has doubled in the same period*.

Source: Houedassou, 2013.

5.1.2 Practices and technologies

Improved practices and technologies increase competitiveness and productivity and can be applied at any stage of the value chain. Areas to work on include:

- **Technical capacity and skills.** In order to improve productivity and reduce costs and food waste, it is necessary to upgrade farm inputs and delivery (of feed, healthcare and animal genetics); production (animal husbandry); handling and transport; and processing practices. Improvement is required not only in production and processing, but also in distribution and outreach. For example, in a genetic improvement programme, ensuring that improved genetic material reaches remote small-scale producers is essential for successful artificial insemination.
- **Business management skills.** Many actors in the value chain lack the skills needed to make a business profitable, including basic accounting, production planning and marketing know-how.
- **Technology.** Value chains aiming to capture value added of livestock products (better quality, processing and treatment) must acquire improved technology – together with the capacity to adopt it. Technology upgrades vary – from using basic tools to adopting complex, mechanized processing systems.

Essential to these activities is knowledge management, technology rollout and the scaling up of good practices (see Step 6.2 on p. 108). As far as possible, facilitation should

TABLE 8
Examples of interventions related to governance and business linkages

Intervention	Outcomes/Impacts
Assist the creation, reinforcement or expansion of the organization of small-scale producers and/or other actors in the value chain	Bargaining power of small producers is increased, with possibility of working with large buyers and of accessing services at reduced cost; governance and business linkages are strengthened
Promote and support the establishment of contract farming, with arrangements for continuous supply and premiums for better product quality (including embedded services – e.g. technical know-how and training)	Product quality is improved; farmers' incomes are increased; continuous supply is secured
Support the development of information systems providing value chain actors with latest market trends and other relevant news, through radio or mobile phones	Actors are better informed and their bargaining power is increased
Assist the stipulation of contracts between landowners and livestock producers on rules for the management and use of grassland areas	Land conflicts are better managed; grassland management is improved
Train facilitators on conflict mediation in specific contexts (e.g. pastoralism)	Conflicts and governance are better managed
Raise awareness of community leaders and local authorities relative to gender issues in livestock production	Practices evolve towards better gender equity and empowerment
Support organization of gender-sensitive capacity building on farming practices involving both men and women	Dialogue is improved; awareness is raised on gender issues; decision-making better reflects gender equity and empowerment
Develop new partnerships between actors to improve collection and aggregation of products via cold chains, allowing remote dairy farmers to send goods to urban supermarkets	Direct access to markets for small-scale producers is increased
Organize multistakeholder meetings and sessions, business round tables and networking	Trust is built among actors

be favoured over direct interventions: training should be provided by extension services or through farmer field schools.

5.1.3 Standards and certification

Amid rising concern from consumers, animal health and food safety standards have become an integral part of any livestock value chain, where they help improve both product and process quality, and increase access to new markets. Higher standards also help minimize food and economic losses.

Animal health and disease risk-management interventions (see Box 13) aim to limit the impact of disease on animal production and avoid outbreaks. Project interventions include: supporting public institutions in policy and legislation; improving operational management; establishing disease surveillance (in cooperation with farmers); and providing capacity development and training for qualified health workers.

Voluntary standards are also gaining importance given growing public concern for environmental, social and animal welfare issues. Such standards increase the quality and competitiveness of livestock products and respond to the demands of new market channels. However, the fact remains that in most developing countries, standards and

BOX 21

Adoption of new practices by small-scale, beef cattle producers in Viet Nam

Rising demand for beef in Viet Nam provided poor cattle farmers in Ea Kar district, Daklak province, with the opportunity of increasing their livelihoods. Until recently, poor carcass quality made it difficult for them to sell their product. The International Fund for Agricultural Development (IFAD)-designed Fodder Adoption Project offered a solution through the adoption of improved fodder practices and better access to market.

One of the key project interventions concerned fattening cattle prior to sale, with supplementary feeding of cassava meal, rice bran and other farm-grown crops and crop by-products. The project worked with farmers' and women's unions to deliver extension services through cross visits, field days and farmers' training programmes.

Various market studies and adoption surveys were conducted between 2004 and 2010. In 2007–2010, the number of households producing fodder increased from 2 407 to more than 3 100, representing almost one-third of all households raising cattle. The number of extension workers and farmers' clubs involved also increased significantly over the period. Interviewed farmers invariably listed labour savings (after grazing animals were moved to stall-feeding) and improved body condition as the main reasons for growing forage. While in 2004 almost all of the cattle produced were consumed locally, four years later 85 percent were sold for urban consumption outside the district.

Source: Stür, Khanh and Duncan, 2013; FAO, 2006.

regulations affecting the livestock sector (except for food safety standards) cater largely to the requirements of export markets.

When considering a given standard or certification (e.g. organic, geographical indication), it is vital to weight the level of constraints for the different actors relative to the potential increase in value added. Moreover, certification alone rarely guarantees increased value addition: interventions of standards and certification may require implementation in parallel with other actions. For example, in France, in the case of protected designation of origin (PDO) livestock products, the level of organization of farmers and their control of the value chain, as well as the degree of constraints related to the specific standard of the PDO, were major determinants of the selling prices to farmers (Lambert-Derkimba, Casabianca and Verrier, 2006). It has been shown that even if small-scale producers have a strong contribution to the image of certified products, market and food safety requirements may nevertheless lead to their exclusion if they lack the capacity to deal with these issues. Therefore, the establishment of a transitional period during which such requirements are suspended or relaxed and technical assistance can be provided to help smallholders improve their practices and thus meet the requirements is recommended (FAO, 2018).

Interventions for technical assistance should address both:

- demand for standards (e.g. improved awareness of animal health food safety standards by value chain actors; capacity for compliance and management of disease outbreaks); and

TABLE 9
Examples of interventions related to practices and technologies

Intervention	Outcomes/Impacts
Facilitate the adoption of improved vaccination and veterinary care practices	Livestock mortality is reduced; production is increased
Promote and support the adoption of improved fodder-growing practices (e.g. support some farmers in producing and selling improved forage seeds to small-scale producers)	Improved forage seeds are made available to small-scale producers to improve their feeding practices
Promote and support the adoption of grazing management plans at community level	Feeding is improved; overgrazing is reduced; carbon sequestration is improved
Promote and support the adoption of improved housing practices and labour-saving techniques for chicken farming	Mortality due to predation is reduced; production is increased; number of chicken keepers rises
Support the implementation of an animal identification system	Traceability of products is improved; performance recording is facilitated
Support the implementation of performance recording (milk production, growth) by small-scale producers	Producers may monitor their production and adapt their practices (selection)
Support the implementation of community-managed breeding programmes	Performance of animals is improved
Support the acquisition of a cooling truck to transport refrigerated milk from producers to dairy plant	Milk sanitary quality is improved; food losses are reduced
Organize training sessions, demonstrations, mentoring, exchanges and exposure visits to build capacity for improved production and processing, business management, marketing, organization and leadership	Performance of the value chain actors is upgraded, both technically and commercially
Train facilitators to conduct a farmer field school cycle	Farmers' capacities are increased in various thematic areas through continuous farmer field school cycles

- supply of services (e.g. testing, accreditation, certification, and support for livestock registration and traceability systems).

They should also ensure that the legal framework and its enforcement are appropriate for small-scale producers and that small-scale producers are sufficiently empowered to contribute to the future process of modifying and enforcing standards and requirements.

5.1.4 Financial services

Value chain finance comes from the following sources:

- **Individuals** – producers' own savings or loans from personal networks (family and community). Livestock themselves act as a savings mechanism and as collateral: yield (e.g. through fattening and reproduction) on stock can give greater returns than savings in a bank.
- **Community** – savings through informal and semi-formal savings and credit groups. This source is prevalent in remote rural areas.
- **Core value chain** – financing by core value chain actors of activities through embedded (and other) services. For example, an input supplier may provide advance credit for provision of inputs to small-scale producers. The governance structure has a significant influence on internal value chain financing (FAO, 2010), which includes in-kind

BOX 22

Structuring the beef value chain to promote the sustainable development of the Pantanal biome

Brazil's Pantanal region is the largest wetland in the world. A huge reservoir of fresh water, the area is extremely rich in biodiversity. Cattle farming is traditionally one of the main economic activities in the region. Aiming to preserve this unique environment, the World Wide Fund for Nature (WWF)-Brazil has been working since 2004 to develop sustainable beef value chains. Organic production has represented an attractive option since the establishment of regulation and certification frameworks in Brazil at the turn of the new century.

Different partners are involved, including the Brazilian Association of Organic Beef Farming (ABPO), the Brazilian Agricultural Research Corporation (EMBRAPA), the Biodynamic Institute (IBD) for organic certification, and Banco do Brasil for credit. Meat processing plants have also been persuaded to pay a premium for certified organic beef. Different distribution actors have been involved as partners, the current distributor being the Korin company, specialized in organic products.

The project includes various initiatives, including capacity building, marketing and awareness raising. The current standards require compliance with the following:

- Only organic fertilizers are used in pastures.
- The addition of urea to salt is prohibited.
- Only plant-based feed supplements are used, 80 percent of which should be from organic sources.
- Health management is based on the use of homeopathy and phytotherapy. The use of allopathic medicines is restricted.
- The use of fire for pasture management is prohibited.
- Official vaccinations are mandatory.
- Animal well-being must be ensured.
- Beef farmers must comply with labour and employment laws and with national environmental legislation (Forest Code).

Beginning with just 16 farmers in the Pantanal in 2005, the organic beef project has since expanded into the Cerrado region, Amazonia, and neighbouring Bolivia and Paraguay.

Source: WWF Brazil, 2015.

credit from large suppliers in the form of inputs, or advances on payments from lead firms and produce buyers. Credits for production are common in contract farming.

- **Support services** – savings, credit, animal insurance and other financial instruments provided by external institutions (e.g. banks, MFIs and formal credit and savings groups).

TABLE 10
Examples of interventions related to standards and certification

Intervention	Outcomes/Impacts
Facilitate the adoption of traceability systems or health standards mandatory for some countries	Export markets are accessed
Facilitate the adoption of voluntary standards (certification, accreditation, labelling etc.) by value chain actors, with a specific focus (e.g. organic, free range, geographical indication, protected designation of origin [PDO], ISO 14000)	Specific market segments with increased added value can be accessed
Support capacity building for testing compliance and certification to specific standards	Consumer trust is increased towards product quality; accountability is improved
Increase awareness raising and capacity building regarding standard requirements and compliance	Value chain actors understand how to comply with standards and why

Financing the livestock sector is often viewed as hazardous due to the risk of disease and extreme weather events; on the other hand, livestock can act as collateral for loans. Access to financing is usually more difficult for actors in informal markets than formal markets, particularly for funds from support services.

Project interventions should address the following:

- **Demand for financial services:** increasing the demand for financial products and services by enhancing the financial literacy and business management capacities of small-scale producers and processors (e.g. bookkeeping, accounting).
- **Supply of financial services:** ensuring an increase in the quality and availability of both semi-formal and formal financial services and products. This includes helping institutions improve administration, reduce transaction costs and set up delivery mechanisms for remote clients with low volume of savings. It also covers the development of suitable financial instruments, including the following:
 - Guarantee facilities to commercial banks or MFIs; leasing services; short- and long-term credit and loans; insurance, including weather-based index insurance.
 - Capacity building of commercial banks, MFIs and savings and credit associations, and outreach to small-scale producers through, for example, mobile banking or agent banking (reducing transaction costs).
 - Promotion of impact investment from private or public sources (ensuring that investments generate a measurable, beneficial social or environmental impact alongside a financial return).

Capacity building should incorporate specific aspects of the livestock sector, such as household decisions to make non-productive investment in additional cattle – a practice that raises social status more than savings in banks do.

For example, in a cattle project in Zambia, expansion of herd size did not result in increased sales: farmers preferred to keep animals as insurance and as an indication of social prestige. Project managers subsequently suggested that the existing social system should not be altered; instead, the project should produce sufficient herd growth to allow farmers to manage separate commercial herds – “developing a two-herd system could eventually lead to commercial management and increased incomes without damaging an important coping mechanism” (Microlinks, 2010).

BOX 23

Addressing financial constraints in a dairy value chain in Uganda

In order to address problems stemming from the remoteness of dairy farmers in Kisoro district of Uganda and facilitate business linkages between actors in the value chain, a memorandum of understanding (MOU) was signed between four parties: the Rubuguri dairy farmers' cooperative society (RUDAFCOS), the savings and credit cooperative (SACCO), Birunga Dairy Industries (BDI – a milk processing plant) and National Agricultural Advisory Services (NAADS – an extension agency).

The MOU established the following:

- A loan was provided by SACCO corresponding to 50 percent of the cost of a cooling truck (to be paid back in instalments) to transport milk to the processing plant. The tanker was supplied by BDI, while the other 50 percent of its cost was financed by the project.
- Individual accounts were opened for cooperative members, with milk payments paid in every 15 days, thus allowing members access to microcredit.
- The farmers' cooperative acted as an intermediary between the dairy plant, the credit institution and producers for milk payments, credit reimbursements and guarantees.

Source: FAO, 2013d.

5.1.5 Other support services

A vibrant, functioning, demand-driven support market is necessary for any value chain to reach its true market potential. Such markets can be treated as individual market systems, as highlighted in the market system analysis. Other relevant services, in addition to standards (Intervention Area 3) and finance (Intervention Area 4) include:

- **Operational services** that directly add value to the livestock product – for example, provision of inputs (e.g. packaging, equipment and technology) and of other services relevant to production and processing (e.g. marketing, logistics and transport); and provision of embedded services (e.g. a machinery manufacturer installing machines, providing training for their use, comprising after-sales maintenance and offering credit and loans).
- **Innovation and training services** – for example, improvement of training; expansion of delivery and outreach of extension services (public, private and community); training and skills development (technical and vocational education and training); and research and development (public, private and international research institutions).

As with any market system, interventions can address both the demand and the supply sides of the services, as well as the support functions and rules and regulations governing these markets. Improving delivery and access to these services, and addressing cost structure and quality of the services, is at the core of any intervention.

TABLE 11
Examples of interventions related to financial services

Intervention	Outcomes/Impacts
Support credit institutions in providing loans targeting small-scale livestock producers and related value chains	Capacities of credit institutions are strengthened; their interest in and services to the livestock sector are increased
Support loan system offered by abattoirs to small-scale producers to purchase feed or young animals	Investment capacities of small-scale producers are increased; supply for abattoirs is secured
Facilitate the establishment of system of guarantees for credit institution (e.g. guarantees backed by producer cooperatives)	Finance sector's interest in and services to the livestock sector are raised
Promote the adoption of money transfer systems by livestock keepers	Investment capacities and reactivity are increased; transaction costs are reduced
Facilitate the adoption of insurance systems (e.g. weather-based insurance schemes)	Actors' economic resilience to externalities (e.g. drought, zoonoses) is increased
Facilitate the financing of specific infrastructure through instruments such as finance leasing and co-financing, producer group financing	Infrastructures are financed
Provide capacity-building and financial literacy training to small-scale producers	Demand for formal financial services is increased; management of finances is improved

BOX 24

Sidai – an example of a private service for livestock producers

Sidai Africa, a private company started in 2011 with support from Farm Africa, aims to deliver veterinary and livestock services (drugs, seeds, fertilizers, artificial insemination, training, marketing etc.) through a network of franchises in Kenya.

The Sidai network has expanded rapidly and now encompasses 130 company-run stores and 350 stockists. The company is able to reach remote areas that are not covered by public extension services, and offers affordable prices for veterinary products and inputs. It ensures quality through franchise control checks and quality agreements with suppliers.

Source: www.sidai.com

Support functions are provided by both public and private actors, and one should make sure that strengthening the role of public services does not crowd out the private sector. Services, which remain largely in the public domain, include research into veterinary drugs, vaccine development and testing, related technologies and improved animal feed resources.

TABLE 12
Examples of interventions related to other support services

Intervention	Outcomes/Impacts
Attract artificial insemination (AI) companies to provide AI services through attractive business models	Small-scale producers have access to improved animals
Train public extension services agents in new practices, species and breeds, and improve outreach of extension services	New practices are introduced to small-scale producers and reach a greater number of them
Assist the establishment of remote technical resource centres run by extension services to provide not only veterinary and insemination services, but also training and information on livestock markets	Services in remote areas are provided; capacities are improved
Assist the establishment of extension services by private actors in the value chain (abattoirs, dairy industry)	Services and outreach in remote areas are improved

5.1.6 Infrastructure

The performance of value chains and markets is constrained by the availability, quality and suitability of infrastructure. This may be general or specific to the livestock sector and value chain, and includes:

- national infrastructure (e.g. rural access roads, cold storage facilities at ports);
- livestock input and production infrastructure (e.g. sheds, fencing, livestock routes, boreholes, dipping facilities, stables, wells);
- collection and marketing infrastructure (e.g. weighbridges, milk collection centres, wholesale marketing structures);
- livestock processing infrastructure (e.g. local slaughter facilities – also catering to small ruminants – dairy plants);
- transport infrastructure (e.g. cold chains, trucks, trains); and
- support service infrastructure (e.g. livestock service centres, veterinary laboratories, quarantine stations, veterinary checkpoints).

Development partners' programmes may not have sufficient funds (and/or mandate) to address large infrastructural works, such as feeder roads or dairy plants, but they can deal with smaller infrastructure needed for successful value chain development in specific areas.

Indeed, while major projects (e.g. access roads and cold chain facilities) can run into millions of dollars, smaller projects (e.g. dipping facilities, fencing and boreholes) may only cost a few thousand.

Furthermore, co-funding and other funding streams and partnerships can be mobilized in order to address infrastructure requirements beyond the capacity, mandate and resources of facilitators and implementers.

Public-private partnerships (PPPs) are an important tool in securing the necessary infrastructure investments, and in sharing costs and risks. PPPs can overcome the limited funding often available to the public sector for the infrastructural upgrading that is essential to economic growth.

BOX 25

Establishing a network of milk collection points in Nangarhar province (Afghanistan)

Implemented through collaboration between FAO and the Afghan Ministry of Agriculture, and financed by the International Fund for Agricultural Development (IFAD), the project, “Development of integrated dairy schemes in Nangarhar province”, aimed to strengthen livestock production systems among poor rural households. Following the Integrated Dairy Schemes model already successfully applied in the country, the project focused on four components: (i) feed resources; (ii) animal health and artificial insemination (AI) services; (iii) integrated dairy development; and (iv) institutional support to milk cooperatives.

One specific outcome concerned the establishment of a network of milk collection points and milk producers’ cooperatives targeting urban consumption in the province. It required the development of adequate infrastructure, which absorbed much of the programme’s budget. Of a total of USD 2 176 674 spent on infrastructure and equipment, the majority was used to build milk chilling centres (22%) and dairy plants (10%), and to purchase a milk pasteurizer (12%) and milk storage tanks (7%).

One apex enterprise, Khatiz Dairy Union (KhDU) was established with 1 510 participating farmers. During the six years of the project, 18 milk collection points, a network of retail outlets, a milk collection business and a multi-product dairy processing plant were created.

Main challenges during the project were related to administrative hurdles in land allocation, growing insecurity and delays in connecting to the electricity grid.

One year after its launch, the plant was producing about 3 000 litres of milk a day. Smallholder farmers’ revenues from milk sales were reported to have tripled: from USD 100 to USD 338 per annum. The project also led to the creation of 17 new jobs. At the end of the project, the whole system was designed to be fully sustainable.

Source: FAO, 2016b.

5.1.7 Policies and regulations

Without an improvement in the business and investment environment at policy level, any increase in a chain’s competitiveness may be limited. For each of the interventions addressed (Intervention Areas 1–6), corresponding policies and regulations need to be in place. In support of policies that are weak or missing altogether, the project can provide evidence-based policy advocacy and assistance through multi-stakeholder platforms, and thus help bring about the policy reforms and institutional development required.

For example, in the pig sector in Uganda (CGIAR, 2014), the policy framework did not distinctly address pig farming and its development (despite the growth of the sector and its recognized potential in terms of food security and rural income diversification). A subsector policy framework was needed to stimulate the growth of pig farming and help Uganda achieve its output targets for meat production (where the focus was traditionally on other livestock sectors with higher production costs). A comprehensive subsector policy is to be developed

TABLE 13
Examples of interventions related to infrastructure

Intervention	Outcomes/Impacts
Contract local communities to improve a local road	Access to markets is improved
Support the establishment of feeding and watering infrastructure, including water pans, feed stores, pastures, fens, veterinary drugstores and markets along stock routes, with a focus on women's limited mobility and physical skills	Services are provided along migration routes or within women's reach
Support the establishment of remote formal market buildings and structures (pens, stables etc.)	Small-scale producers are able to sell their animals at a better price
Support the establishment of cooling and collection centres allowing milk to reach urban markets	Milk from remote, small-scale producers is sold directly to urban supermarkets, providing them with a continuous supply
Support the establishment of strategically located processing units (abattoirs, tanneries, dairy plants etc.) through private investment or PPPs	New meat, leather and meat products are produced using improved techniques and technologies
Evaluate infrastructure needs for sector development and assess public and private investment needs	Future infrastructure investments are planned
Attract private investment for livestock-related infrastructure development	Finance of future infrastructure can be negotiated

to address the specificities of pig production, including breeding, farm management, access to animal health services, drugs and feeding, productivity, and, in particular, marketing of livestock and livestock products for export markets (which is currently missing altogether).

Public-private dialogue (PPD) can cover specific value chains, or industries and sectors. As mentioned, in the governance component (Step 3.3 on p. 53), PPD can strengthen the role of small-scale farmers' organizations through capacity building (especially in negotiation, lobbying and advocacy).

Institutional development also entails strengthening the implementation of policies and regulations at national level, and – through decentralization – giving regional and local governments greater powers over issues such as animal health, food and food safety. Furthermore, a legal framework needs to be there to ensure policies are implemented correctly.

Policy interventions may not always be sector-specific. They can address broader economic policy options (e.g. trade policies, improved public financial management, industrialization programmes, export promotion policies) or support sector regulations (e.g. food and safety norms and MFI regulations). Policies, regulations and legislation on environmental impacts should be in place, covering issues such as land-use planning and management, as well as coordination with other land uses. Other relevant areas include regulations on land tenure and leases, title deed provision and management of common grazing land, especially on transboundary stock routes.

A review of the pig industry in Zimbabwe (Mutambara, 2013), for instance, identified a set of key regulatory constraints, including import duty policies, genetically modified organism (GMO) policy, border protocols and costly labour laws. It was concluded that in order to equip stakeholders with strong, evidence-based instruments to advocate for a favourable policy environment, a regulatory review was needed to provide hard evidence that existing regulations hampered the industry.

BOX 26

Ethiopian policy toward the leather value chain

With an eye on export markets, the leather and leather products industry (LLPI) was prioritized by Ethiopia to capitalize on the country's comparative advantage in livestock resources. It soon became clear that the issue of quality must be tackled at different stages in the leather value chain. With the support of various international agencies (including United Nations Industrial Development Organization [UNIDO] and the German Agency for Technical Cooperation [GIZ]), the Government launched an ambitious and comprehensive upgrading programme.

The LLPI national strategy framework is set out in different policy documents, including the Industrial Development Strategy and the Plan for Accelerated and Sustained Development to End Poverty (PASDEP). The Industrial Development Strategy framework is based on several principles, including: prioritizing linkages between industry and agriculture; promoting export-oriented and labour-intensive sectors; and supporting public–private partnerships. The PASDEP outlines policy interventions in three key areas: (i) support to the private sector; (ii) coordination and guidance on investment decisions between different stakeholders; and (iii) addressing market failures.

In order to foster the development of LLPI, an independent federal government institution, the Leather Industry Development Institute (LIDI), was established in 2004 to formulate policies, enhance technological development and attract potential investors. It also formed partnerships with foreign associates, such as the Central Leather Research Institute in India, focusing on small and medium enterprises and stakeholders located in rural areas.

Specifically, the policies implemented by LIDI involved:

- providing information and support to investors through market studies and research;
- enhancing human capital and technology acquisition through research and training;
- promoting public–private sector coordination (e.g. by facilitating bureaucratic procedures for entrepreneurs);
- promoting green industrial production processes and offering training and research and development (R&D) on green technologies; and
- providing government fiscal incentives (e.g. tax exemptions, bilateral investment treaties).

In terms of performance, LLPI grew from USD 44 million to USD 110 million between 2004 and 2012. Industrial policy institutions may constitute an important element in establishing effective industrial policies addressing challenges to industrial development and structural change, and promoting the partnerships required to develop the sector.

Source: Altenburg, 2010; Mbate, 2017.

TABLE 14
Examples of intervention related to policies and regulations

Intervention	Outcomes/Impacts
Assist and promote the development of policies that support livestock production, processing, trading (nationally and internationally) and private investments through specific tariffs, subsidies, guaranteed prices and tax exemptions	Livestock production and products are supported
Assist the development of a legal framework allowing the private sector to organize itself	Legislation enforcement is supported
Assist the development of policies that promote the organization and coordination of value chain actors in an inclusive manner, allowing them to make their voices heard at a regional and national level	Small-scale producers and actors can band together to address their concerns and participate in the development of policies
Assist the development of a legal framework encouraging value-added processes through official recognition and promotion of specific voluntary standards	Value added in value chains under targeted voluntary standards is increased
Assist the development of natural resources that promote and support ecosystem services and good practices relative to environmental management, and address the trade-offs between agriculture and the environment	Environmental sustainability of livestock production is increased
Assist the development of a legal framework (law, decrees, ordinances) on pastoral land rights, land tenure and rangeland management	Rights of pastoralists are established; conflicts are settled; rangeland management is improved
Assist the development of a standard code of hygiene for production, processing and distribution that does not set conditions that small-scale producers cannot meet	Sanitary quality of products is improved and standardized
Assist the development of transboundary agreements relative to the movement of animals and animal products	Livestock migration is facilitated; international trade is improved

Cross-cutting issues

As previously stated, value chain projects may bring up cross-cutting issues which require interventions in the various components, or, in some cases, interventions on specific problems.

For instance, the sustainable use of land, water and the environment, as well as enhanced climate resilience, are essential to ensure that productivity and expanded production systems make minimal or negligible impacts on the environment (see also Box 15 on p. 70).

In the Tanzanian Livestock Development Strategy (The United Republic of Tanzania, 2010), for example, supporting the sustainable use of grazing land involves: carrying out an inventory of available pastures and agreeing on guidelines for their use; organizing pastoralists into producer organizations; promoting the establishment of irrigated pasture seed farms; and promoting forage conservation in the form of hay and silage.

In some cases, specific tools have been developed for issues such as conflict and crisis situations (USAID, 2008; LEGS, 2014; FAO, 2016c) or employment matters (Herr and Muzira, 2009; FAO, 2014c), and they should be used together with the guidelines.

5.2 PARTNERSHIPS IN IMPLEMENTATION

In order to design and implement the vision, strategy and action plan, projects need to enter into partnership(s) with strategic (or political) implementing partners (Table 15). Participatory approaches should go beyond extractive or consultative interactions with stakeholders and engage them in developing **collaborative solutions to value chain constraints**. A strategy and development plan will be no more than a document unless partners can be found to take ownership of the vision and of its design and operationalization, including financing the development plan. These partnerships need to be defined from the onset of the programme, and are closely linked to project interventions as well as to the scaling-up and exit strategies.

Projects act as facilitators for development strategies (they build incentives, connect and build trust among stakeholders, ensure stakeholder commitment and buy-in etc.) in partnership with relevant actors, adopting a market-oriented approach in all interventions. They must find answers to questions such as: What is the demand for the intervention? What price are the value chain actors willing to pay for this service? If they cannot afford this service, what mechanism (credit, embedded services etc.) can be introduced to help them? Does the intervention lead to intended behavioural changes and impacts? Projects should recruit partners who have the capacity to perform facilitation functions themselves.

It is important that the **role of each actor is clearly defined** in implementing interventions, and that **actors assume responsibility and ownership** from the start. For each intervention (or intervention group) a leader should be identified who is responsible for the delivery of the activity.

The value chain mapping, governance and capacities analysis provide input for identifying critical partners for project implementation. Projects need to identify value chain actors who act as **change agents** (producer organizations, sectoral associations, lead firms etc.). The change agents must have:

- influence within the value chain and its dynamics;
- a value-chain-wide overview;
- genuine interest in the project (and must be committed to change);

TABLE 15

Partner types

	Partner	Description
1	Strategic or political partners Public sector	Key political partners (e.g. ministry of agriculture, department of livestock, other relevant ministries) for political support in promoting an enabling environment for value chain development
2	Core value chain partners Private sector (mainly)	Partnerships with actors directly involved in the production of livestock products (e.g. producer organizations, lead firms, traders)
3	Support function partners Private and public sector	Supporting actors who are not directly involved in production but provide performance-enhancing services and expertise (e.g. R&D, financial services, packaging companies)

- willingness and capacity to promote change;
- willingness and capacity to invest resources; and
- leverage position in the value chain.

Partnering with the private sector and mobilizing private capital is important in order to ensure the effectiveness and sustainability of project interventions. The decisions and investments of the core value chain actors are what drive any development strategy. The private sector is much more suited to cater and adapt to the changing context and dynamics of a value chain, as it is closer to the market, driven by profits and market opportunities, and hence more efficient.

The strategic partners are expected to address any market inefficiencies that constrain project interventions, either directly or indirectly. The role and balance of private and public operations within livestock services and support functions is becoming a critical issue, particularly as public services (e.g. extension services, breeding programmes) are often inefficient, costly to run and do not provide the coverage needed.

Public-private partnerships (PPPs) are the core of any value chain development strategy. They can come in the form of public-private collaboration and public-private dialogue, or be based on more formal contractual arrangements. Areas covered may include livestock infrastructure development, research, technology development and innovation, and the delivery of services and support to small-scale producers and processors in the value chain. PPPs can be used to overcome funding limitations, improve efficiency, productivity and outreach (through markets and sales networks), help share risks and reduce transactions costs (e.g. by organizing farmers into producer organizations). However, in order for contractual PPPs to be effective, a sound enabling environment (i.e. an appropriate PPP institutional, legal and regulatory framework) needs to be in place.

Public-Private-Producer Partnerships (PPPPs) bring producers into the process and can help to leverage private investment, strengthen policy dialogue, secure technology and expertise, and utilize other actors' social and political capital to scale up positive results sustainably. Combining public goods, financial instruments and contractual arrangements with small-scale farmers and agribusinesses through the 4Ps can attract additional resources and support from banks, equity investors, input suppliers, equipment-leasing firms and other value chain suppliers (IFAD, 2016b).

Step 6. Monitoring, evaluation and scaling up

6.1 MONITORING AND EVALUATION SYSTEMS

In order to enable a project to achieve its vision and to measure its effectiveness, a results-based monitoring and evaluation (M&E) system is needed. M&E systems serve different purposes at various times during a project, but should be designed from the onset to include **clear, logical, causal impact indicators** (and milestones), together with **baseline data and targets**.

M&E system functions:

- **Project steering.** The system provides information assessing the effectiveness of project interventions (operational monitoring) and of overall strategy (strategic monitoring). It allows the project to adapt in order to optimize project impact and ensure that value chain development is on track to achieve the strategic vision. This information is relevant at all levels, from field staff (operational) up to project management (strategic). Monitoring provides feedback for implementation and project management on a continuous basis, and is particularly relevant due the dynamic nature of markets and the enabling environment.
- **Measurement of project effectiveness and impact.** The system provides quantitative and qualitative assessment of the effectiveness of project implementation, and of the extent of achievement of indicators, objectives and development vision. Monitoring is carried out at intervals, mid-term and at the end of the project, depending on donor requirements. It provides valuable information for accountability and learning, and for future project design.
- **Communication, learning, accountability.** Most value chain development projects are funded with taxpayers' money, hence spending needs to be transparent and accountable. The M&E results communicate the progress and overall effectiveness of the project to the general public, strategic partners and donor(s). Project progress is also used in external communication to attract new partners, bring buyers and lead firms on board, and mobilize resources.

A project M&E system is part of a larger, programme M&E system. These guidelines differentiate between monitoring as an ongoing analysis of project performance, and evaluation at mid-term, at regular intervals and/or at the end of a project to measure overall performance.

Who should get involved?

A steering committee should be established to implement the M&E process – collecting the required data in collaboration with relevant actors, and reporting to the development and strategic partners, as well as to the value chain associates. The M&E of the value chain is related to the management of the programme, and hence is linked closely to, if not integrated into, the programme management structure.

Depending on what the scaling-up strategy implies – institutionalization of the process or an increase of the scale – institutional and political partners and new market players (involving different actors across the extended value chain) should be involved.

6.1.1 Defining the overall M&E framework

The first step is to define the purpose of the M&E and the target audience (internal management, development partners, strategic partners etc.).

The following questions must be answered to **define the M&E milestones**:

- How often are M&E reports required by the funding agency and/or political partners (monthly, quarterly, annually) and in what format?
- How will monitoring results feedback to project management, including at field level?
- Based on funding requirements and resources, is an end-of-project evaluation foreseen, and are mid-term or regular evaluations planned?
- How will the evaluation be conducted (internal or external consultants)?

Further questions to be resolved include:

- What M&E resources are available? This will define how detailed the M&E framework will be and how elaborate and frequent data collection will be.
- Who is responsible for M&E for the project and for individual components?
- How often will assessments be conducted?

6.1.2 Causal impact framework

When developing the action plan, the interventions' causal impact framework is defined, from inputs to activities to outputs and intermediate and final outcome/s, including behavioural changes and systems-level changes needed to trigger impact in support of the project vision. It is also necessary to:

- define project objectives, components and subcomponents, together with respective indicators (indicators should be as measurable as possible);³
- operationalize the indicators through sequenced interventions, activities and inputs (e.g. experts, workshops, travel, construction materials);
- define the baseline (data and information collected during the value chain diagnosis can also be used as baseline data); define targets for the indicators;
- define data sources (see Box 5 on p. 42); and

³ Indicators should be SMART, i.e.: Specific (target a specific area or business function); Measurable (quantify as much as possible); Agreed upon (specify who will do what); Realistic (truly achievable given the time and resources available); Time-related (specify when the result[s] are to be achieved) (Broughton and Hampshire, 1997).

TABLE 16
Impacts, outcomes and outputs

Level	Description
Ultimate impact	<ul style="list-style-type: none"> • Poverty alleviation (economic, social and political aspects)
Impact	<ul style="list-style-type: none"> • Increased income opportunities • Increased decent employment opportunities • Increased value added and growth
Outcome	<ul style="list-style-type: none"> • Increased competitiveness • Increased profits, sales, turnover • Increased access of the poor to markets (e.g. end-markets, input markets) and services (e.g. financial services) • Increased sustainability • Increased social equity
Intermediate outcome	<ul style="list-style-type: none"> • Improvements in chain performance and productivity due to thematic focus of project interventions, e.g. climate mitigation, improved productivity of animals, increased climate resilience, improved technology, improved services, strengthened enabling environment
Use of output	<ul style="list-style-type: none"> • Behavioural change of the value chain actors <ul style="list-style-type: none"> - Actions that are taken and services provided - Linkages and virtuous self-sustained circles established - Policies and other enabling environment conditions
Output	<ul style="list-style-type: none"> • Outputs from value chain project facilitation and support that address the capacity and incentives of value chain actors and conditions in the enabling environment (e.g. active producer association, guidelines on food safety, market information provided)

- define means of verification (e.g. project outputs, minutes of meeting, surveys, documents).

The causal pathway for achieving an intended impact largely depends on the focus of the project and the strategy. Table 16 shows the various levels of a results-based framework in value chain development. Each of the levels can be broken down into intermediate steps.

Indicators specific to small-scale livestock producers may eventually relate to the animals themselves (productivity in terms of milk production or growth, reproduction, mortality etc.) and also to the status of livestock production on the farm (share of income from livestock) or the different issues raised in Part I (see Figure 2 on p. 11) (e.g. milk losses throughout the chain, changes to carrying capacity of pasture areas and rangelands). Annex 4 provides a non-exhaustive list of examples of outcome and impact indicators related to livestock value chains.

6.1.3 Data collection

Defining the M&E questions ([sub]indicators and milestones) allows to establish what is being monitored and evaluated, and hence what data are needed.

- Defining M&E questions, based on causal impact logic:
 - Evaluation questions are broader – e.g. in a project on climate resilience, did the interventions succeed in addressing the needs of the community (relevance) and in increasing climate resilience (outcome)?

- Based on Organisation for Economic Co-operation and Development (OECD) criteria, reference projects are evaluated based on their relevance, efficiency, effectiveness, outcome and sustainability.
- Monitoring questions are more specific – e.g. did training in financial bookkeeping result in increased management of finances by processors, leading to greater access to loans (as the processors maintained financial records) and increased efficiency (due to cost management)?
- Data sourcing:
 - Both quantitative and qualitative data, depending on the indicators, should be used.
 - Secondary and primary data collection methods (see Box 5 on p. 42) should be adopted.
 - Data collection methods should be consistent throughout the project (from diagnosis to data collection), in order to make data comparable when monitoring progress.
 - Who is responsible for data collection (e.g. project staff, enumerators, external consultants)?
 - How often should data be collected and at what level?

6.1.4 Reporting

In what form the data and analysis are synthesized depends on the purpose:

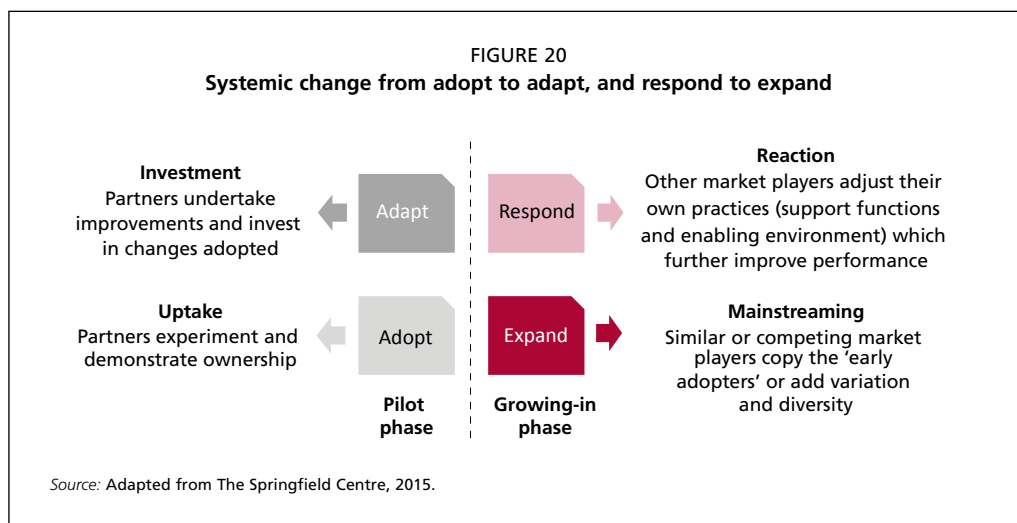
- **Monitoring** – reporting to weekly component meetings (short-term and strategic); monthly and quarterly management meetings (strategic); quarterly, bi-annual or annual donor and strategic partner reporting (accountability).
- **Evaluation** – mid-term, interval (strategic and accountability) and/or final project evaluation (accountability).
- **Communication** – articles, project brochures, fact sheets, presentations, social media and/or publications.

Lessons from the field:

- However effective a value chain development programme may be, value chain performance is always dependent on the context – not only the general business environment and the economy, but also on other factors such as climate change and the political situation. Hence M&E systems should also factor in the enabling environment in monitoring changes and possible impacts on project progress.
- Given that the value chain approach facilitates change and this facilitation may take place in submarket systems (e.g. input or service markets), the causal impact chain to improved performance of the core value chain is longer and hence more difficult to measure.
- Value chain development is a dynamic process, taking place in constantly changing markets and contexts. Hence M&E should be an ongoing process too.

6.2 SCALING UP

Scaling-up strategy is designed from project onset and is integrated into the overall project development strategy. Scaling up can include either of the following, and is usually a combination of both:



- **Scaling out** – increasing the geographical scale.
- **Scaling up** – the institutionalization and strengthening of the process.

Not all value chain development programmes necessarily have an explicit scaling-up focus; however, all programmes, in their selection of partners and strategy, can incorporate scaling-up strategy elements.

The scaling-up process, like any development strategy, is led by the private sector, even though the public sector plays an important role in the enabling environment and some support functions. Figure 20 shows the *Making Markets Work for the Poor* model with the “growing-in” phase of interventions and innovation (technical, commercial etc.) resulting in greater depth and breadth of market system changes.

Projects intervene to ensure sustainable changes in behaviour and practices (i.e. adopt and adapt). In order to deepen and broaden these market system changes, the project widens partnerships and strategy to address support functions and the enabling environment, thus enhancing responsiveness and sustainability (i.e. expand and respond).

A scaling-up strategy does not stand alone but is embedded in overall project design and various interventions. Just like any other strategy, a scaling-up strategy needs a vision (usually integrated into the overall project vision) and entails answering the following questions:

Is the intervention scalable? This must be established from the start. Though the scaling-up strategy is incorporated from the onset, scaling-up activities should only begin once the project is certain that the value chain actors have adopted and integrated behaviour and practice changes into their core operations and that this results in improved performance and intended outcomes. Without impact, there is no need to scale up. Hence, project monitoring should capture the drivers and enabling factors that facilitate the scaling-up process. And it should be borne in mind that very complex, context-specific interventions are more difficult to scale up:

- Is the intervention flexible enough to be applied in different contexts (i.e. different market systems, actors, agro-climatic conditions etc.)?

- Is there a demand elsewhere for this kind of intervention?
- Has this intervention, its process and impact, been documented and packaged in such a way that it can be replicated elsewhere?

The scaling-up pathway needs to be determined and must contain these elements:

- **Selection of partners.** In the selection of partners, consideration of outreach and leverage is one of the critical factors. Which partners have influence over the value chain or sections of the value chain, and have the potential to reach out to others? These may include actors in the core value chain (scaling out), though the actors usually addressed are more often found in support functions or the enabling environment (scaling up and out) to ensure the crowding-in phase. They include industry associations, larger investors, private business providers, training institutions and political partners.
- **Capacity building and research and development.** The objective is to incorporate capacity building into training, and research and development, in order for the value chain actors to understand the underlying principles so that they can adapt to a changing context. It is especially important to establish clear linkages and effective relationships between beneficiaries and reliable sources of knowledge to make sure that knowledge and capacity building continue for the entire duration of the project.
- **Drivers and incentives.** Drivers, including leadership, are needed to push the scaling-up process forward. This is linked to selection of partners, where champions (such as lead firms, early adopters, political partners) are selected and incentives are put in place so that key value chain actors commit themselves to a scaling-up agenda (e.g. developing commercially viable business models for input providers to supply inputs to small-scale farmers).
- **Financing.** Critical to any scaling-up strategy is the financing of activities, whether through private investment, public funding or PPPs. This is linked to the overall funding of the value chain and the upgrading of financial services.
- **Institution building at mid- and macro level.** Partnering and institution building must involve mid- and macro-level actors, such as business associations, research institutions, ministries and specialized departments. Linked to the enabling environment, certain support functions need to be in place to facilitate the scaling up (e.g. suitable credit facilities, public and private extension services).
- **Enabling environment.** A conducive enabling environment must be in place for interventions to be scaled up or replicated in other sectors. This involves the policy framework and the facilitating of public funding and private investment.

Box 27 provides a concrete example of scaling up agricultural practices in Burkina Faso.

BOX 27

Scaling up conservation agriculture for mixed farmers in Burkina Faso

Conservation agriculture (CA) is an approach to managing agro-ecosystems for improved and sustainable farm production while preserving the environment and local resources. It relies on three principles – minimal soil disturbance, permanent soil cover and diversification of crop species used in sequence.

The FAO project aimed to introduce CA to mixed farmers in Burkina Faso. The practices relevant to livestock production included silage and salt-lick production, and the processing of *Mucuna* seed as value-added livestock feed.

The scaling strategy was embedded in the project from the beginning, and used farmer-discovery benchmark sites linked with farmer field schools to experiment, raise awareness and build capacity around CA practices.

For instance, with a cost-benefit ratio of 527 percent, the silage and salt-lick practices were quickly adopted by farmers, who found they could also make extra income by selling surplus feed. Group training was conducted in several villages to support the promotion of farmer-to-farmer dissemination of the practices. The number of beneficiary farmers increased from an initial 120 to around 1 000 by the end of the project.

Source: Kassam *et al.*, 2009.

Phasing out

From the onset of value chain implementation, a project should have a clear phasing-out strategy – both for the intervention as a whole and for individual components. This is critical for interventions to be sustainable and for the system to continue responding and adapting to changing market, social and environmental conditions. The phasing-out strategy is **closely linked to a project’s sustainability as well as to its scaling-up strategy**. Box 28 gives a concrete example of an exit strategy.

It must be noted that some interventions benefit from long-term support, in particular those value chain interventions that are part of a government agricultural investment plan or development programme. However, it is essential to phase out interventions to avoid dependence on external resources and actors.

The two main questions to be resolved concerning partnerships:

- Who will facilitate, lead and/or implement the specific roles or functions required in the action plan during the intervention and after it ends? Both the capacity and the incentives of partners need to be considered in order to ensure the continuation of interventions. The selection of partners is discussed in Step 5.2 (p. 102) and Step 6.2 (p. 108).
- Who will pay for the activities during the intervention and after it ends? This entails the development of innovative, market-oriented business models and is linked to the financial services development of the value chain.

With these questions in mind, the identification of one or several champions can be useful to bring impetus and seek further marketing opportunities, links and funding after the end of the project.

In practice, the success of an exit strategy can only really be gauged a few years after the end of a project. Ideally, the M&E system should find a way to document phasing-out results to feed into the learning process on value chain interventions.

BOX 28

**The Zimbabwe RARP programme:
an exit strategy anchored in diverse partners and processes**

The Rural Agriculture Revitalization Programme (RARP) was a Netherlands Development Organization (SNV) programme implemented in 2009 to improve smallholder families' food security and incomes through increased capacity and investments by small and medium agrobusinesses. Among other actions, it supported the development of value chains in the dairy, oilseeds and horticulture subsectors.

RARP based its exit strategy on five pillars:

- **Mature and stable private company (contracting firms) relations with farmer groups.** After several years of building relationships and trust between companies and small-scale producers, those companies could permanently embed small-scale producers into their supply chains.
- **Public institutions and agencies fully able to replicate or integrate RARP approaches and models as part of their regular support to small-scale farmers.** The training of extension services and farmers' associations enabled those institutions to support the commercially oriented value chains in terms of information supply, training and the provision of services such as artificial insemination.
- **Development agencies with similar interventions.** Development partners were able to continue to support contract farming and scaling-up interventions.
- **Further SNV programmes.** Synergies were sought with ongoing SNV programmes where relevant.
- **Institutions or platforms that were innovated or strengthened through the programme.** Associations strengthened through RARP had improved sustainability due to the services provided to their own members.

Source: SNV, 2016.

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Annexes

Annex 1

Non-exhaustive list of actors to be considered within a livestock value chain

Stage	Actor	Potential distinguishing factors
Input supply	<ul style="list-style-type: none"> • Veterinary drug providers • Breeding companies • Feed suppliers 	
Production	<ul style="list-style-type: none"> • Producers • Breeding stock suppliers • Young animal producers • Fatteners/finishers • Mixed/pastoralists... 	<ul style="list-style-type: none"> • Owner/non-owner • Gender and age • Peri-urban/rural • ...
Trading	<ul style="list-style-type: none"> • Small traders • Wholesalers • Live animal transporters/traders • Collectors 	
Processing	<ul style="list-style-type: none"> • Milk cooling centres • Dairy processors • Abattoirs 	<ul style="list-style-type: none"> • Big/small • ...
Retailing	<ul style="list-style-type: none"> • Butchers • Supermarkets • Restaurants • Markets • Public sector (schools, hospitals etc.) • Exporters/importers 	<ul style="list-style-type: none"> • Urban/rural • ...
Consumption	<ul style="list-style-type: none"> • Consumers 	<ul style="list-style-type: none"> • Poor/rich • Urban/rural • ...
Private services	<ul style="list-style-type: none"> • Private extension services • Sector associations • Veterinarians • Controllers (veterinarians, food safety etc.) • Finance providers • Certification bodies 	
Government/ public services	<ul style="list-style-type: none"> • Public extension services • Tax collectors • Control and safety standards services • Ministries • Research 	

Annex 2

List of selected tools for further value chain analysis and development

GENERAL VALUE CHAIN TOOLS

FAO – Sustainable food value chains – Guiding principles

<http://www.fao.org/3/a-i4012e.pdf>

FAO – Methodological toolkit for promoting business partnerships in agrifood chains

<http://www.fao.org/docrep/015/i2416e/i2416e00.pdf>

IFAD – IFAD value chain toolkits

<https://www.ifad.org/en/web/knowledge/publication/asset/39402559>

GIZ – ValueLinks manual – The methodology of value chain promotion

<http://star-www.giz.de/dokumente/bib/07-0674.pdf>

GIZ – Guidelines for value chain selection

https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/instructionalmaterial/wcms_416392.pdf

ILO – Value chain development for decent work – How to create employment and improve working conditions in targeted sectors

http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/instructionalmaterial/wcms_434363.pdf

ILO – Guidelines for value chain selection – Integrating economic, environmental, social and institutional criteria

http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/instructionalmaterial/wcms_416392.pdf

ILO – An operational guide to local value chain development

http://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_165367.pdf

International Trade Centre – online market analysis tools (Trade Map, Market Access Map...)

<http://legacy.intracen.org/marketanalysis/default.aspx>

USAID – Value chain development Wiki

<https://www.microlinks.org/good-practice-center/value-chain-wiki>

ACIAR – Making value chains work better for the poor: a toolbox for practitioners of value chain analysis

<https://www.aciar.gov.au/node/10751>

CIAT – LINK methodology: A participatory guide to business models that link smallholders to markets

http://www.value-chains.org/dyn/bds/docs/838/LINK_Methodology.pdf

ARD – Social and environmental sustainability of agriculture and rural development investments: A monitoring and evaluation toolkit

<http://siteresources.worldbank.org/INTARD/Resources/ESmetoolkit.pdf>

NUTRITION

Value chains for nutrition

<http://cdm15738.contentdm.oclc.org/utills/getfile/collection/p15738coll2/id/124837/filename/124838.pdf>

Improving nutrition through multisectoral approaches

<http://documents.worldbank.org/curated/en/625661468329649726/pdf/75102-REVISED-PUBLIC-MultisectoralApproachestoNutrition.pdf>

A market analysis and decision tree tool for response analysis: cash, local purchase and/or imported food aid?

<http://www.cashlearning.org/downloads/resources/tools/mifira-decision-tree-tool.pdf>

FOOD SAFETY AND QUALITY

Food safety risk analysis – A guide for national food safety authorities

<http://www.fao.org/3/a-a0822e.pdf>

Guide to good farming practices for animal production food safety

http://www.oie.int/fileadmin/Home/eng/Current_Scientific_Issues/docs/pdf/eng_guide.pdf

FOOD LOSS AND WASTE

Toolkit: reducing the food wastage footprint

<http://www.fao.org/docrep/018/i3342e/i3342e.pdf>

GENDER AND YOUTH TOOLS

Developing gender-sensitive value chains. A guiding framework

<http://www.fao.org/3/a-i6462e.pdf>

Gender assessment of dairy value chains: evidence from Ethiopia
<http://www.fao.org/3/a-i6695e.pdf>

Review of gender and value chain analysis, development and evaluation toolkits
https://cgspace.cgiar.org/bitstream/handle/10568/35656/IIri_manual_10.pdf?sequence=1

Gender in value chains – Practical toolkit to integrate a gender perspective in agricultural value chain development
http://agriprofocus.com/upload/ToolkitENGGender_in_Value_ChainsJan2014compressed1415203230.pdf

Maximising impact of youth entrepreneurship support in different contexts – Background report, framework and toolkit for consultation
<http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7728.pdf>

Tackling hazardous child labour in agriculture: Guidance on policy and practice – User guide
<http://www.ilo.org/ipecinfo/product/download.do;jsessionid=d624188be882ee72d2cca9c29812861233fe7db2b55ad703daca56cc6e957388.e3aTbhulbNmSe34MchaRahaKbhv0?type=document&id=2799>

MONITORING AND EVALUATION

DCED Standard for results measurement
<http://www.enterprise-development.org/measuring-results-the-dced-standard/>

POLICY

FAO: Value chain analysis for policy making: Methodological guidelines and country cases for quantitative approaches
<http://www.fao.org/3/a-at511e.pdf>

SUSTAINABILITY AND ENVIRONMENT

LEAP (Livestock Environmental Assessment and Performance) technical guidance documents for understanding the environmental performance of livestock supply chains
<http://www.fao.org/partnerships/leap/publications/en/>

IFAD How to do: Climate change risk assessments in value chain projects
<https://www.ifad.org/documents/10180/30b467a1-d00d-49af-b36b-be2b075c85d2>

Social and environmental sustainability of agriculture and rural development investments: a monitoring and evaluation toolkit
<http://siteresources.worldbank.org/INTARD/Resources/ESmetoolkit.pdf>

Guide to PAS 2050 – How to assess the carbon footprint of goods and services
http://aggie-horticulture.tamu.edu/faculty/hall/publications/PAS2050_Guide.pdf

Greenhouse gas emissions from ruminant supply chains: a global life cycle assessment
<http://www.fao.org/docrep/018/i3461e/i3461e.pdf>

Greenhouse gas emissions from pig and chicken supply chains: a global life cycle assessment
<http://www.fao.org/docrep/018/i3460e/i3460e.pdf>

LIVESTOCK SPECIFIC TOOLS

Development of integrated multipurpose animal recording systems
<http://www.fao.org/3/a-i5702e.pdf>

Phenotypic characterization of animal genetic resources
<http://www.fao.org/docrep/015/i2686e/i2686e00.pdf>

Good practices for the feed industry – implementing the Codex Alimentarius Code of Practice on good animal feeding
<http://www.fao.org/docrep/012/i1379e/i1379e.pdf>

Eleven ways to improve animal marketing
<http://www.fao.org/3/CA3409EN/ca3409en.pdf>

LIVESTOCK COMMODITIES TOOLS

Technical and investment guidelines for milk cooling centres
<http://www.fao.org/3/a-i5791e.pdf>

Small-scale poultry production: Technical guide
<http://www.fao.org/3/a-y5169e.pdf>

Decision tools for family poultry development
<http://www.fao.org/3/a-i3542e.pdf>

Guide to good dairy farming practice
<http://www.fao.org/docrep/014/ba0027e/ba0027e00.pdf>

Good practices for the meat industry
<http://www.fao.org/3/a-y5454e.pdf>

Goat value chain toolkit: A guideline for conducting value chain analysis in the goat sub-sector
http://www.iga-goatworld.com/uploads/6/1/6/2/6162024/scaling-up_successful_practices-part05.pdf

ANIMAL HEALTH AND ZONOTIC DISEASES

A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application
<http://www.fao.org/docrep/014/i2198e/i2198e00.pdf>

Designing and implementing livestock value chain studies – A practical aid for Highly Pathogenic and Emerging Disease (HPED) control

<http://www.fao.org/docrep/015/i2583e/i2583e00.pdf>

PASTORALISM

Improving governance of pastoral lands

<http://www.fao.org/3/a-i5771e.pdf>

Moving herds, moving markets: Making markets work for African pastoralists

<https://cgspace.cgiar.org/handle/10568/76901>

PPPPs

IFAD How to do: Public-Private-Producer Partnerships in agricultural value chains

<https://www.ifad.org/documents/10180/998af683-200b-4f34-a5cd-fd7ffb999133>

VALUE CHAINS PORTAL AND EXAMPLES

Sustainable Food Value Chains Knowledge Platform

<http://www.fao.org/sustainable-food-value-chains/home/en/>

Value Chains Knowledge Clearinghouse

<http://tools4valuechains.org/>

Annex 3

Key issues for value chain mapping and analysis

(SUB)SECTOR AND COMMODITIES (FOR [SUB]SECTOR CHARACTERIZATION AND VALUE CHAIN SELECTION)

- key priority subsectors of the livestock sector (cattle, goat, sheep, pig, poultry [chicken, duck], camel, buffalo etc.); main commodities of priority sectors (meat, milk, eggs, wool, leather);
- additional role and functions of livestock (draught power, capital assets, fertilizer, status etc.) and trade-offs to be considered;
- market data and trends, including domestic and international current demand and forecasts, consumer preferences and market requirements;
- economic relevance of the (sub)sector in terms of numbers, production volumes, employment, nutrition and contribution to GDP, and other socio-economic factors and trends; and
- overall understanding of the sector (policies, actors, stakeholders, production stages and systems etc.).

END-MARKET (FOR VALUE CHAIN SELECTION AND END-MARKET ANALYSIS)

Description of market

- current demand for commodities, in local, domestic and export markets; growth forecasts for the next 10 years;
- main consumers in the end-markets; various market segments; market locations (e.g. high-end urban consumers, local rural markets); market channels (e.g. export, regional, wholesale markets);
- consumption habits and preferences; other trends and dynamics (e.g. branding strategies, marketing policies);
- niche and high-end markets to be developed (e.g. organic, free-range chicken, packaged urban meat products); and
- relevant trade agreements (regional, international) and other factors that influence markets and market access.

Growth and competitiveness

- growth opportunities within each market segment;
- key players in the markets (including competitors and potential substitutes);
- existing and potential competitors (e.g. imports, other supply chains);

- key success factors in markets (e.g. reliable quality supply, proximity to markets, established reputation, market drivers and requirements); and
- the main constraints faced by producers and processors in accessing markets.

Economic analysis and competitiveness

- main costs involved in the value chain from production through to distributions – labour, inputs, transport, transactions;
- pre- and post-harvest losses;
- prices at the various steps of the chain, and volumes traded;
- consumer prices at various end-markets;
- seasonal and annual fluctuations in prices; seasonal variations in supply; and
- quality specifications and certification requirements.

PRODUCTION

Core value chain

Characterization of production

- livestock production systems and conditions (e.g. solely livestock production [landless or grassland-based systems] or mixed farming [rainfed or irrigated])¹ and maps with production areas;
- scale of production (e.g. land area, livestock holding); total production from each farming system; seasonality of production;
- other services provided by livestock (manure, labour, collateral, ecosystem services, other products [leather, milk and meat]);
- main producers – small-scale farmers, pastoralists and medium/large farms – and their numbers;
- characteristics of small-scale producers – socio-economic conditions, food security;
- eventual specialization of roles among small-scale producers (breeders, fatteners);
- other sources of income (other crops, on- and off-farm employment); and
- gender-differentiated roles and responsibilities in production.

Governance, incentives and capacities

- organization of farmers into cooperatives or producer organizations; role of community leaders and other relevant actors in the community;
- incentives and behaviour of livestock keepers at market; how do smallholders access markets and make sales – spot markets, contracts and agreements;
- attitudes and coping mechanisms related to risk; food consumption preferences; access to land, labour, capital, information, support systems etc;
- capacities and resources available to small-scale producers – financial, educational, natural resources (land, water etc.), including storage capacity; and
- barriers faced by small-scale producers in entering the value chain, and how to overcome them.

¹ <http://www.fao.org/docrep/v8180t/v8180t0y.htm>

Production and technology

- production practices;
- level of technology and innovation used in production;
- main challenges faced by livestock producers (e.g. access to quality inputs, suitable, quality breeds, animal health, lack of access to markets and market information, climate change impacts); and
- gender-differentiated constraints, including access to production inputs and resources.

Economic and financial analysis

- livestock production consumed, maintained (stored) and sold;
- cost structure of production and pricing; different market channels and pricing;
- volumes and value of production output – aggregated by producer group (i.e. mixed small-scale producers, pastoralists, medium/large farms);
- average yield per unit of activity (body weight at a given age, annual egg or milk production etc.); average productivity of small-scale producers;
- revenues and gross margins; main cost and profit drivers;
- losses during production;
- quantification of labour for livestock activities – household members or hired workers; and
- off-farm sources of income and expenses.

Support functions and enabling environment

- role of community associations and producer groups in livestock production; presence, role and capacity of producer associations and apex bodies; services and support provided to farmers by these bodies; support received; capacity of partners;
- other services available at the community and local level in terms of inputs, production, training, market information, marketing; pricing and nature of services offered;
- supporting sanitary and phytosanitary standards and regulations, and services (including financial);
- climatic conditions and climate change impacts; other environmental impacts on production;
- infrastructure available and needed; and
- relevant policies and strategies in place to support production (e.g. collective action, capacity building).

INPUTS

Core value chain

Characterization of inputs

- main supplies provided (suitable breeds, feed, veterinary drugs, artificial insemination etc.);
- type and nature of suppliers – private sector or public; location and distance of suppliers;

- farmers' access to supplies – directly, through intermediaries, via government support and extension workers, through cooperatives;
- reliability of inputs supply, and growth envisaged to keep pace with animal production;
- trade-offs considered when purchasing inputs; and
- main constraints faced by producers in accessing inputs.

Governance, incentives and capacity

- embedded services provided by input suppliers (i.e. use of inputs, cost effectiveness, choice of inputs etc.);
- payment facilities – credit etc. – offered; and
- labelling and packaging available and appropriate for small-scale producers.

Economic and financial analysis

- number of input suppliers;
- volume and value of inputs;
- inputs quantity (animal feed, veterinary drugs etc.) per unit of output;
- price and/or range of public and private input supplies;
- cost structure of input supplies; different markets channels and pricing; and
- revenues and gross margins; main cost and profit drivers.

Support functions and enabling environment

- extension services and support provided by public programmes for input suppliers and access by small-scale producers;
- crowding in of private sector in service provision;
- financial and credit facilities available for suitable inputs;
- other services available (public or private), including research and development facilities, especially with regards to animal genetics and animal health;
- infrastructure available and needed; and
- policies and strategies in place to promote development of local input supply market (e.g taxes on inputs, private sector participation, financial incentives etc.).

AGGREGATION

Core value chain

Characterization of aggregation

- main constraints faced by the producers in marketing and selling their produce;
- type and nature of markets; distances to market;
- contractual agreements;
- mode of produce sales – individually, through cooperatives, to traders, directly, spot market, contract agreements; modes of transaction;
- main actors involved in aggregation – large farms, traders, farmers themselves, cooperatives; and
- condition of access roads and routes; transport used and quality of transport (e.g. time taken, viability of cold chains, storage); losses incurred.

Governance, incentives and capacities

- services provided by traders (e.g. market information, market requirements, market forecasts and credit); cost of services;
- functions (e.g. fattening, aggregation, marketing, storage), incentives and capacities; and
- standards and requirements.

Economic analysis

- transaction costs;
- cost structure of aggregation and pricing; different markets channels and pricing;
- revenues and gross margins; main costs and profit drivers;
- volumes and value of aggregation for different market channels; and
- losses during aggregation.

Support functions and enabling environment

- traders' associations and apex bodies; services and support provided to members; support received by associations;
- financial services available;
- government policies and mechanisms in place to promote marketing of livestock commodities;
- marketing policies, boards and market regulations in place; and
- infrastructure available (e.g. collection points, cold chains, storage, road access, fattening stations) and infrastructure needed.

PROCESSING

Core value chain

Characterization of processors

- type of processing of livestock products;
- characterization of processors (e.g. small enterprises, large firms, international companies);
- sourcing of raw material and inputs (e.g. reliability, quality requirements);
- structure of the supply chain (e.g. integrated, contract agreements with producers and traders); and
- investment required for processing.

Governance, incentives and capacity

- incentives and capacities of the processors;
- industry standards and requirements, and compliance;
- demand and end-market orientation by processors;
- resources, including financial, available to processors; and
- main constraints and limitations faced.

Economic analysis

- number of processors;
- volumes and value of processing – aggregated and categorized;
- investments;
- cost structure of production and pricing; different market channels and pricing;
- losses during processing;
- productivity and production capacity; storage capacity;
- competitiveness of processors as compared with competitors;
- revenues and gross margins; main cost and profit drivers; and
- employment creation and wages.

Support functions and enabling environment

- professional and sectoral associations supporting processors, and services provided;
- support services, including financial services available (e.g. credit, research, testing, inputs such as packaging);
- main infrastructural limitations to processing (e.g. cost and reliability of electricity, access to markets, cold chain facilities);
- sanitary and phytosanitary standards and regulations, and services (including financial) provided;
- policies and strategies in place to support added value and processing; and to attract public and private investments;
- infrastructure requirements (access to roads, abattoirs, processing plants, cold chains, storage etc.); and
- special attention to be paid to gender-based constraints – such as time poverty, physical skills and limited mobility – given the particular importance of women in processing.

DISTRIBUTION

Core value chain

Characterization of distribution

- market channels used;
- wholesalers and retailers, and their location;
- other key actors in distribution;
- structure of supply chain (payment terms, delivery conditions, services provided);
- standards and requirements, and compliance; and
- storage and other facilities.

Governance, incentives and capacities

- incentives and capacities of wholesalers, retailers and other distributors; and
- services and business linkages to end-consumers, lead firms and producers/traders.

Economic analysis

- number and size of wholesalers and retailers;
- volume and value in each distribution channel (including wholesalers vs retailers);
- cost structure and pricing;
- storage capacity; and
- revenues and gross margins; main cost and profit drivers.

Support functions and enabling environment

- relevant livestock policies and programmes promoting domestic markets and access to international markets;
- export support measures (tax exemptions or subsidies);
- sanitary and phytosanitary standards and regulations;
- marketing policies and regulations; and
- policies for investment in market promotion, customs and export promotion as well as development of domestic markets and related tax regulations.

Annex 4

Examples of outcome and impact indicators for livestock value chain development projects

Outcome indicators	Impact indicators
<i>General</i>	
<ul style="list-style-type: none"> • Repartition of value chain functions among actors in the chain • Repartition of value added across the steps of the value chain • Continuity of buyer–supplier relationships • Average size of orders from buyers • Stability of the prices received 	<ul style="list-style-type: none"> • Importance of income from livestock activities relative to total household income • Monetary income (household level, local currency per year) • Income “in kind” (if relevant) • Number of participants in value chain • Number of people employed in value chain activities (or related activities) • Diminished income instability (qualitative, based on more detailed criteria) • Improved food security and nutrition (qualitative, based on more detailed criteria)
<i>Governance and business linkages</i>	
<ul style="list-style-type: none"> • Number of well-functioning producer or processor groups • Participation of small-scale producers in these groups • Degree of stability of groups • Level of integration of the value chain • Number of actors linked to Market Information Systems • Extent of written sales contracts or partnerships • Number of women and men participating in gender-sensitive capacity-building sessions 	<ul style="list-style-type: none"> • Increased equity throughout the value chain • Diminished income instability (qualitative, based on more detailed criteria) • Number of female participants (absolute and relative to male) in the activities, and gender division in labour • Women’s control of monetary income from chain
<i>Practices and technologies</i>	
<ul style="list-style-type: none"> • Percentage of beneficiaries of capacity-building sessions • Extent of adoption of specific practices or technologies in terms of number of farmers or animals 	<ul style="list-style-type: none"> • Reduction in animal mortality • Increased productivity per animal (milk, eggs, growth etc.) • Increased productivity at producer level (number of animals sold, milk produced over the year etc.) • Changes to carrying capacity of pastures and rangelands • Quantity of natural resources (e.g. volume, hectares) • Quantified level of pollution or waste • Measurable human or animal health improvements

(cont.)

Outcome indicators	Impact indicators
Standards and certification	
<ul style="list-style-type: none"> • Volume of products handled under specific standards or certification • Degree of compliance with specific standards 	<ul style="list-style-type: none"> • Value added for each actor complying with a specific standard or certification
Financial services	
<ul style="list-style-type: none"> • Proportion of actors with loans, and value of loans • Proportion of actors adopting insurance systems 	<ul style="list-style-type: none"> • Number of animals raised • Monetary income of value chain actors (household level, local currency per year) • Overall repayment rate by financial partners • Value of new private investment in the VC
Other support services	
<ul style="list-style-type: none"> • Proportion of animals vaccinated • Proportion of animals inseminated with AI 	<ul style="list-style-type: none"> • Reduction in animal mortality • Increased productivity per animal (milk, eggs, growth etc.)
Infrastructure	
<ul style="list-style-type: none"> • Quantification of infrastructure constructed (km of roads, number of modern, hygienic dairy plants etc.) • Number of producers or volume reaching new markets through the development of an infrastructure • Number of actors using infrastructure 	<ul style="list-style-type: none"> • Increased income related to the use of a given infrastructure (road, dairy plant) • Quantified reduction in food losses and waste
Policies and regulations	
<ul style="list-style-type: none"> • Legal and regulatory framework established to oversee the governance of the value chain • Legal and regulatory framework established to protect traditional access rights • Legal and regulatory framework established to improve feed safety 	<ul style="list-style-type: none"> • Decrease in informal markets in favour of formal ones • Increase in tax revenues related to the value chain • Decrease in number of conflicts over land tenure • Production volume exported in compliance with international food safety standards • Reduction in food waste and losses, and in disease outbreaks

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C – Chinese	* – Out of print
E – English	** – In preparation
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This publication constitutes a practical development tool, which implements the sustainable food value chain framework with a focus on small-scale livestock producers, targeting an audience of project design teams and policymakers. Small-scale livestock producers are important actors in food production, human health and management of landscapes and animal genetic resources. However, they face a number of challenges, which hamper their productivity, access to market, and competitiveness vis-à-vis their larger counterparts.

By integrating the concepts of value addition and the three dimensions of sustainability, the sustainable food value chain framework not only addresses questions concerning the competitiveness, inclusion and empowerment of small-scale producers, but also incorporates the cross-cutting issues that are increasingly embedded in development projects. These guidelines take the user through the different steps of value chain development, highlighting the particularities of the smallholder livestock sector, such as multi-functionality, specific production cycles or food safety issues, through concrete examples.

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